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ES Chapter 8 - Ecology and Nature Conservation

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THE CROWN
 ESTATE

East Hemel

8. Ecology and Nature Conservation

8.1 Introduction

- 8.1.1 This Chapter of the ES assesses the likely significant effects of the Development upon ecology. It has been prepared by Temple. This Chapter is supported by further detailed information contained within **ES Volume 2, Appendices 8.1 – 8.16**.
- 8.1.2 It describes: the assessment methodology; the baseline conditions currently existing at the Site and in the surrounding area; the likely significant environmental effects; the mitigation measures required to avoid, reduce or offset any significant negative effects; the likely residual effects after these measures have been employed; and the 'Type 2' (Inter-project) cumulative effects associated with the Development in combination with other developments.
- 8.1.3 Nomenclature used in this report follows Stace (2019) for vascular plants and the Natural History Museum Species Dictionary (2023) for other species. For simplicity, common names only are used in the text with scientific names provided in the baseline reports.

8.2 Assessment Methodology and Significance Criteria

Baseline Determination

- 8.2.1 The baseline was determined through a combination of desk study and field-based surveys and assessments. The methodologies used to determine the ecological baseline are summarised within this Chapter.
- 8.2.2 Ecological assessment undertaken to inform the Development comprise the following (all provided in **ES Volume 3**):
- Preliminary Ecological Appraisal (PEA), (**Appendix 8.1**);
 - Hedgerow Survey Report (**Appendix 8.2**);
 - Bat Roost Survey Report - Buildings (**Appendix 8.3a**);
 - Bat Roost Survey Report – Trees (2024 GLTAs) (**Appendix 8.3b**);
 - Bat Roost Survey Report – Trees (2025 GLTAs and Roost Presence/Absence) (**Appendix 8.3c**);
 - Bat Activity Survey Reports – Site Wide (**Appendix 8.4a**);
 - Bat Activity Survey Reports – Crossing Points (**Appendix 8.4b**);
 - Great Crested Newt Survey Report (**Appendix 8.5**);

- Dormouse Survey Report (**Appendix 8.6**);
- Badger Survey Report (**Appendix 8.7**);
- Badger Bait Marking Surveys Report (**Appendix 8.8**);
- Barn Owl Survey Report (**Appendix 8.9**);
- Breeding Bird Surveys Report (**Appendix 8.10**);
- Raptor Survey Report (**Appendix 8.11**);
- Wintering Bird Surveys Report (**Appendix 8.12**);
- Reptile Survey Report (**Appendix 8.13**);
- (Shadow) Habitats Regulations Assessment (**Appendix 8.14**);
- Lighting Impact Assessment (**Appendix 8.15**); and
- Arboricultural Impact Assessment (**Appendix 8.16**).

Desk Study

8.2.3 The following data sources were reviewed to provide information on the location of internationally designated sites within a 15km radius of the Site and other statutory designated sites, non-statutory designated sites, legally protected species, Species and Habitats of Principal Importance, and other notable species and habitats that have been recorded within a 2km radius of the Site, and for bats recorded within a 6km radius (based on the Core Sustainance Zone (CSZ) for barbastelle, a species previously recorded on Site):

- Herts Environmental Records Centre, the local Biological Records Centre, principally for species records and information on non-statutory sites;
- MAGIC (<http://www.magic.gov.uk/>) - the Government's on-line mapping service; and
- Ordnance Survey mapping and publicly available aerial photography.

Field Surveys

8.2.4 A summary description of the methodologies adopted for the field surveys undertaken is provided below. Full descriptions are included within the technical appendices referenced above.

Preliminary Ecological Appraisal (PEA)

8.2.5 A previous survey report produced by Wardell Armstrong in 2015 was reviewed and informed the methodology for the PEA¹.

¹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Preliminary Ecological Appraisal. 2015.

8.2.6 UK Habitats Survey (UKHabs) and protected species assessment were initially undertaken in March, April and July 2024. A follow-up survey was conducted in August 2025 and at the beginning of September 2025 to cover minor extensions to the Site boundary and provide an update to the initial PEA where relevant. Extensions to the Site boundary included a small section to the north of Hemel Hempstead Road, required for Redbourn Road junction upgrades. This area falls within the North Hemel Hempstead development and associated ecological baseline information to inform this assessment was provided by Bloor and Pigeon in 2025² based upon surveys conducted by FPCR. .

8.2.7 Habitats were described and mapped following standard UKHabs survey methodology (UKHab Ltd, 2023). The aim of this survey was to map all the habitats present and identify any that may potentially be ecologically important and/ or to have potential to support ecologically important and/ or legally protected flora or fauna. Habitats were also assessed against descriptions of Habitats of Principal Importance (HPI) as set-out by the JNCC (BRIG, 2008)³.

Hedgerow Survey

8.2.8 Hedgerow surveys were undertaken in May and July 2024. Further visits were undertaken in August and September 2025 to survey additional hedgerows not included within the original red line boundary of the Site. Hedgerows were described and mapped following standard procedures outlined in The Hedgerow Survey Handbook⁴.

Bat Survey

8.2.9 Previous bat survey reports produced by Wardell Armstrong were reviewed and informed the survey methodology⁵.

8.2.10 A Preliminary Roost Assessment (PRA) of buildings B1-B27 was undertaken in March, June and July 2024, following best practice guidelines⁶. Figures showing the locations of the buildings can be found in Appendix 1 of the Bat Roost Survey Report - Buildings (**ES Volume 3, Appendix 8.3a**). Based on the findings of the PRA, dusk emergence surveys were conducted between May and September 2024 and during May and June 2025 on buildings with suitability for bats and/or previously confirmed as roost sites: B1-4, B6-B8, B12, B18-B20, B22, B24 and B27 in line with the same guidelines.

8.2.11 Ground Level Tree Assessment (GLTA) surveys were undertaken in June 2024 on 432 individual or groups of trees using close-focusing binoculars for detailed inspection of the higher-level Potential Roost Features (PRF) and a high-powered torch to illuminate PRF. The survey of trees at the Site was carried out from the ground only and was undertaken in line with best practice guidance published by the Bat Conservation Trust⁶. The 2024 GLTA surveys were conducted in the absence of a fixed development parameter plan, further GLTAs and subsequent presence/absence surveys including climbed surveys and dusk emergence surveys, were undertaken on 18

² FPCR. North Hemel Hempstead - Biodiversity ES Chapter 13. Report for Bloor Homes & Pigeon 2025

³ BRIG. Report on the Species and Habitat Review (Report by the Biodiversity Reporting and Information Group (BRIG) to the UK Standing Committee). 2007.

⁴ Defra. The Hedgerow Survey Handbook. Second Edition. 2007.

⁵ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Bat Survey Report. 2020; Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Bat Roost Survey of Buildings. 2017; Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Bat Activity Report. 2017; Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Tree Inspections for Bats. 2017. Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Bat Survey Report. 2020

⁶ Collins, J. (ed.) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London. 2023.

individual trees and four groups of trees in August 2025, following an update to the Site boundary and confirmation of trees requiring removal to deliver the development. The 2025 GLTA surveys followed the same methodologies as those applied in 2024. Following the GLTA surveys, trees identified as requiring further survey (FAR) or PRF-M were climbed and subject to a close inspection with a torch and endoscope. Where climbed inspections were not possible, emergence surveys were undertaken during the active flight season for bats May to October 2025, in line with best practice guidelines⁷.

8.2.12 In line with best practice guidelines⁵, one activity transect per season (Spring (April and May), Summer (June, July and August) and Autumn (September and October)) were scheduled to be completed along with static bat detector deployment each month from April to November 2024. The Site was divided into five separate transect routes across the four survey areas to enable surveyors to effectively cover the entire area. Transect route three was split into two sections (3.1 and 3.2) for the purposes of mapping but was surveyed as a whole transect area each time. Spring surveys were split between April and May; summer surveys were conducted in June; and, autumn surveys were conducted in September, all in suitable weather conditions. Ten monitoring devices were deployed within suitable habitat across the Site from April to November 2024. The static detectors were placed out before sunset and were left in place to obtain at least ten consecutive nights of recording.

8.2.13 Two crossing point survey visits were undertaken at each of 12 locations in summer (August 2024) and autumn (September 2024). Field surveys commenced at sunset and continued for approximately 120 minutes. Two surveyors monitored bat activity at each location. Surveyors were equipped with full spectrum bat detectors which allowed for the recording of any bat passes which were in close proximity to them, along with thermal imaging cameras which allows for maximum visual detection of a bat in flight. Each surveyor/ analyst recorded direct observations (i.e. those they had seen) of bats, the species (where this could be accurately determined) and flight behaviour; ground-level distance from the feature; and height above the ground with reference to a 5m marker, when observed. The closest distance the bat came to the feature was recorded, and for flight height during crossing, the lowest height was recorded. Incidental records of bat activity near the surveyor locations were also collected. Each passing bat was recorded as a separate observation, regardless of whether the same bat had clearly passed the surveyor more than once.

Great Crested Newt Survey

8.2.14 A previous great crested newt survey report produced by Wardell Armstrong was reviewed and informed the survey methodology⁸. Third party reports for the North Hemel Scheme were also reviewed as part of the desk study⁹.

8.2.15 Great crested newt surveys were undertaken on accessible ponds in June 2024 and included a Habitat Suitability Index Assessment using the standardised Habitat Suitability Index (HSI) methodology¹⁰ and where possible/relevant, Environmental DNA (eDNA) survey following the methodology set out in Natural England's

⁷ Collins, J. (ed.) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London. 2023.

⁸ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Great crested Newt Survey Report. 2015

⁹ FPCR. North Hemel Hempstead – Appendix 13.3 Great Crested Newt Survey Report. Report for Bloor Homes & Pigeon. 2025

¹⁰ ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom 2010.

Technical advice note for field and laboratory sampling of great crested newt DNA¹¹. A site visit was conducted in April 2025 to reassess relevant accessible ponds that were found to have either been dry in the previous year or for previously inaccessible waterbodies. No further eDNA surveys were able to be undertaken in 2025 as ponds either remained dry or access was not possible due to health and safety / access restriction reasons.

Hazel Dormouse Survey

- 8.2.16 A previous hazel dormouse survey report produced by Wardell Armstrong was reviewed and informed the methodology for the dormouse survey¹².
- 8.2.17 A hazel dormouse survey was undertaken between May and November 2024, following best practice guidelines available at the time¹³. A total of 200 dormouse nest tubes were deployed between the 30 April 2024 and 1 May 2024, spaced at approximately 20-30m intervals. Checks were undertaken during June, August, October and November. This level of survey effort aligns with recommendations in the updated guidelines¹⁴, where a minimum of 50 nest tubes can be used as a standalone method from April to November to survey good quality habitats including scrub, hedgerows and woodland.

Badger Surveys

- 8.2.18 A previous survey report produced by Wardell Armstrong was reviewed and informed the methodology for the badger surveys¹⁵. Third party reports for the North Hemel Scheme were also reviewed as part of the desk study¹⁶.
- 8.2.19 A walkover survey and assessment was undertaken in March 2024. During the survey, all areas of suitable habitat were systematically examined for evidence of badger activity. Where present, the surveyors recorded all badger field signs including setts, dung pits and latrine sites, paths and runs, snuffle holes and foraging signs, hair and footprints. Setts were classified with reference to methods employed in Harris, Cresswell and Jefferies¹⁷ and Wilson, Harris¹⁸ (1997).

Barn Owl Surveys

- 8.2.20 A previous survey report produced by Wardell Armstrong was reviewed and informed the methodology for the barn owl surveys¹⁹. Third party reports for the North Hemel Scheme were also reviewed as part of the desk study²⁰.

¹¹ Biggs *et al.* Analytical and methodological development for improved surveillance of the great crested newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford. 2014.

¹² Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Dormouse Survey Report. 2017.

¹³ Bright, P., Morris, P. and Mitchell-Jones, T. The Dormouse Conservation Handbook: Second Edition. English Nature, Peterborough. 2006.

¹⁴ Buillon *et al.* Hazel Dormouse Conservation Handbook. Third Edition. 2025

¹⁵ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Badger Survey Report. 2017.

¹⁶ FPCR. North Hemel Hempstead – Appendix 13.4 Badger Survey Report. Report for Bloor Homes & Pigeon. 2025

¹⁷ Harris, S., Cresswell, P. & Jeffries, D. Surveying Badgers. 1989.

¹⁸ Wilson, G.J., Harris, S. & McLaren, G. Changes in the British Badger Population, 1988–97. 1997.

¹⁹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Barn Owl Survey Report. 2019.

²⁰ FPCR. North Hemel Hempstead – Appendix 13.6: Breeding Bird Survey Report. Report for Bloor Homes & Pigeon. 2025

- 8.2.21 The barn owl survey consisted of three separate stages. Stage 1 – Scoping surveys were completed on 14 June 2024 and between 17 to 20 June 2024. Stages 2 & 3 - Investigative Field Surveys and Nest Verification surveys were undertaken in conjunction on 26 June 2025, 25 July 2025 and 25 August 2025.
- 8.2.22 Stage 1 surveys comprised a scoping assessment to identify any features of the landscape broadly suited to barn owl and these features were then surveyed via a walkover of the Site to identify any potential nest sites (PNS), active roost sites (ARS) and temporary roost sites (TRS). These features were mapped along with requirement for further survey.
- 8.2.23 Stage 2 – Investigative Field Survey and Nest verification surveys were undertaken following current good practice (Shawyer, 2011.²¹). Surveys searched for signs of barn owl activity at previously recorded PNS, ARS and TRS, using telescopic ladders, high powered torch, endoscope and binoculars. The Nest Verification survey was done alongside the Stage 2 survey where necessary to confirm an active breeding site.

Breeding Bird Surveys

- 8.2.24 A previous survey report produced by Wardell Armstrong was reviewed and informed the methodology for the breeding bird surveys²². Third party reports for the North Hemel Scheme were also reviewed as part of the desk study.²³
- 8.2.25 A total of six visits were made to the Site between March and July 2024 with at least ten days between each visit. The survey methodology was based on the current good practice Bird Survey Guidelines²⁴ which considers start time flexibility to account for species-specific variation in optimal activity times. The Site was split into four transects for the purposes of the surveys given the large-scale of the Site. Each transect route was walked slowly and methodically, and all birds seen or heard were recorded using the standard British Trust for Ornithology (BTO) species and behaviour codes. The surveyor used binoculars to aid bird identification and scaled field maps to record the registrations and numbers of each observation. All areas within the survey area were accessed to within approximately 50m on each visit as per the recommendations within recognised guidance.

Raptor Survey

- 8.2.26 Previous survey reports produced by Wardell Armstrong were reviewed and informed the methodology for the raptor survey²⁵. Third party reports for the North Hemel Scheme were also reviewed as part of the desk study²⁶.
- 8.2.27 Scoping surveys for raptors were undertaken whilst on the second breeding bird survey visit in April 2024. The purpose of the scoping surveys was to verify if potential nesting sites identified from aerial maps were correct and

²¹ Shawyer, C.R. (2011). Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. IEEM, Winchester.

²² Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Breeding Bird Survey Report. 2019.

²³ FPCR. North Hemel Hempstead – Appendix 13.6: Breeding Bird Survey Report. Report for Bloor Homes & Pigeon. 2025

²⁴ Bird Survey & Assessment Steering Group. Bird Survey Guidelines (BSG). 2024;

²⁵ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Additional Targeted Raptor and Owl Report. 2019; Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Red Kite Survey Report. 2019.

²⁶ FPCR. North Hemel Hempstead – Appendix 13.6: Breeding Bird Survey Report. Report for Bloor Homes & Pigeon. 2025

to identify additional potential nesting sites, such as mature trees, pylons and buildings from the ground. The results were recorded on separate field maps.

8.2.28 The field surveys were designed to follow the methods outlined by Hardey et al.²⁷ The analysis of previous relevant survey reports and the results of the scoping surveys were then used to identify 21 vantage points (VP) overlooking suitable habitat and features. Two survey visits were undertaken in June, covering all vantage points. Surveys started between 8 am and 9 am, with the surveyor spending at least 30 minutes at each VP and staying until there was sufficient evidence to suggest if a nest site was present and active or otherwise. All known potential nest sites within each location were observed and surveyors noted activity for all raptor species with the specific aim of determining if a potential nest site was active and if any young were present. Behaviours observed for included adult birds returning to the nest with material such as twigs, leaves, or grass, and or with food for their young.

Wintering Bird Surveys

8.2.29 A previous survey report produced by Wardell Armstrong was reviewed and informed the methodology for the wintering bird surveys.²⁸ Third party reports for the North Hemel Scheme were also reviewed as part of the desk study.²⁹

8.2.30 Wintering bird surveys were carried out using four pre-defined transects. Access was permitted for all survey areas and transects were designed to enable good views across the Site and wider landscape. The habitats within the Site were not considered likely to provide significant value for passage birds, due to its inland location and absence of: large waterbodies that could support migratory wildfowl; large undisturbed fields attractive to large flocks of geese or waders; watercourses that could act as flyways; or other notable habitat features otherwise scarce in the wider landscape that could provide stepping stones. Therefore, it was considered appropriate to target surveys during the core winter months, in line with best practice guidelines.³⁰ Four survey visits were carried out between November 2024 and February 2025 in line with best practice. During each visit, each of the four transect routes was walked slowly and methodically. All birds seen within or adjacent to the Site were recorded using the standard British Trust for Ornithology (BTO) species codes. Stopping points were also incorporated to record species that could flock in significantly large numbers such as winter thrushes, starlings, waterfowl and waders, and to minimise double counting. The surveyors used binoculars and a telescope to assist with bird identification and scaled field maps to record the registrations/numbers of each bird species observed. Details of the weather, as well as constraints and details of any disturbance were all recorded for each survey.

Reptile Survey

8.2.31 A previous survey report produced by Wardell Armstrong was reviewed and informed the methodology for the reptile survey.³¹

²⁷ Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. and Thompson, D. Raptors - A field guide for surveys and monitoring. 2013

²⁸ Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2017; Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2019.

²⁹ FPCR. North Hemel Hempstead – Appendix 13.7: Wintering Bird Survey Report. Report for Bloor Homes & Pigeon. 2025.

³⁰ Bird Survey & Assessment Steering Group. Bird Survey Guidelines for assessing ecological impacts, v.1.1.0. 2023

³¹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Reptile Survey Report. 2017.

8.2.32 Reptile surveys were undertaken over six visits between May and September 2024, with an additional survey visit carried out in April 2025. The survey protocol followed accepted standards for reptile surveys³². The survey involved a combination of visually searching for reptiles (direct observation) and the use of artificial refuges.

Predicting Future Baseline Conditions

8.2.33 In addition to determining the current baseline through field survey, it is important to characterise the likely future baseline conditions as they would be in the absence of the Development, over the same timescale over which the Development is proposed to be in place. These predictions are based on the existing land-use, habitat extent and conditions, current and anticipated management and any existing or proposed developments, based on publicly available information on existing planning applications.

Prediction Methodology

Scope of Assessment

8.2.34 The scope of this assessment has been determined based on the development proposals provided and the baseline information collated and takes account of the following considerations:

- suitable spatial and temporal scales for the assessment;
- potentially important ecological features that could be subject to significant positive or negative impacts;
- proposed activities with potential to give rise to significant ecological effects;
- additional proposals with potential to give rise to cumulative effects in combination with the Development; and,
- relationships with other issues e.g., water, landscape.

8.2.35 The geographic scope of the assessment (i.e., the zone of influence) is defined below in Sections 8.2.37 and 8.2.38.

8.2.36 The temporal scope of assessment is taken to include the lifetime of the Development from initial site works, through to construction and operation.

Identification of the Zone of Influence

8.2.37 The geographic scope of the assessment (i.e., the zone of influence) is defined by the area within which potential ecological impacts are considered likely to occur. This includes the physical extent of land-use associated with the proposals as well as indirect or exported effects of pollution and light or noise disturbance that may affect a wider area. The scope of assessment is determined for each impact based on its likely spatial extent and the distribution of ecological features likely to be affected.

³² Froglife. Reptile Survey, an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. 1999.

8.2.38 The ZoI for the Development varies and is based on the relative sensitivity of a receptor, on a precautionary basis where necessary, and is as follows:

- A 6km radius of the Site in terms of the potential effects on bats, based on the Core Sustenance Zones (CSZs) attributed to the bat species present on-site;
- A 2km radius for Schedule 1 birds;
- A 5km radius for wintering birds;
- A review of the Impact Risk Zones (IRZ) in respect of statutory sites of nature conservation importance, to take account of the potential effects of disturbance from recreational activity on any sensitive habitats present;
- A 2km radius of the Site in relation to potential effects on non-statutory sites, legally protected species, Species and Habitats of Principal Importance, and other notable species and habitats; and
- A 50m radius around sensitive habitats in relation to construction-related dust deposition, and 200m distance from the Affected Road Network (ARN) in relation to effects from air emissions on sensitive habitats and sites (Natural England 2018.³³; IAQM 2020.³⁴).

Assessment of Importance

Importance of Ecological Features

8.2.39 In line with CIEEM guidelines.³⁵, features likely to be important in terms of biodiversity are identified and evaluated on a geographical scale of importance as set out in **Table 8.1**. In descending level of importance, features assessed to be ‘important’ are categorised as: International; national (England); regional (south-east); county (Hertfordshire), local authority-wide area (St Albans District Council/ Dacorum Borough Council) and local (Hemel Hempstead and the parishes of Redbourn, St Michael, Flamstead and Great Gaddesden, Nash Mills). Features of less than local level of importance are classified as being of importance at the Site level, where they have ecological importance within the ZoI of the Site, or otherwise as being of negligible importance.

Table 8.1: Definition of Nature Conservation Policy: Importance/ Sensitivity

Scale of Importance	Examples of Definitions
International	<p>An internationally designated site e.g., SPA, SAC, Ramsar Site, or site considered worthy of such designation;</p> <p>A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller area of such habitat which are essential to maintain the viability of a larger whole; or,</p> <p>A regularly occurring, substantial population of an internationally rare species.</p>

³³ Natural England (2018) Natural England’s approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations.

³⁴ IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites.

³⁵ CIEEM. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester. 2018.

Scale of Importance	Examples of Definitions
National	<p>A nationally designated site e.g., SSSI, or site considered worthy of such designation;</p> <p>A viable area of habitat identified as a Habitat of Principal Importance (also known as a Section 41 habitat), or of smaller areas of such habitat, which are essential to maintain the viability of a larger whole; or,</p> <p>A regularly occurring, substantial population of a nationally rare species.</p>
Regional	<p>Areas of Internationally or Nationally important habitats, which are degraded but are considered readily restored; or,</p> <p>A regularly occurring, substantial population of a regionally scarce species</p>
County	<p>A site designated as a County Wildlife Site (CWS); or,</p> <p>A regularly occurring, substantial population of a species scarce in the county</p>
Local, District, Parish	<p>A site designated as a Local Wildlife Site (LWS); Viable areas of Local Biodiversity Action Plan (BAP) Priority Habitat, or small areas of such habitat which are essential to maintain the viability of a larger whole; or,</p> <p>A regularly occurring, population of a species scarce in the District(s)/ Parish(es)</p>
Site	<p>A regularly occurring population within or immediately adjacent to the Site itself</p>
Negligible	<p>A habitat which offers little value for nature conservation e.g., arable field</p>

Importance Based on Biodiversity Attributes

8.2.40 The ecological importance of areas of habitat and plant communities has been assessed against published selection criteria where available. Local Biodiversity Action Plans (BAPs), where they remain relevant, have been searched to identify whether action has been taken to protect all areas of a particular habitat and to identify current factors causing loss and decline of particular habitats. The presence of legally controlled weeds has also been taken into account.

8.2.41 When assigning a level of importance to a species, its distribution and status, including a consideration of trends based on available historic records, has been taken into account. Other factors influencing the value of a species are legal protection, rarity and Species Action Plans (SAPs). Guidance, where it is available, for the identification of populations of sufficient size for them to be considered of National or International importance has also been taken into account. Additionally, evaluation of importance has been based on inclusion on Annexes II, IV and V of the Habitats Directive, Annex I of the Birds Directive, under Section 41 of the NERC Act (2006) as Species of Principal Importance in England, as Red/Amber under the Birds of Conservation Concern 5 (the UK Red List for birds), under Schedules 1, 5 and 8 of the Wildlife and Countryside Act (1981 as amended) and as Local BAP species.

8.2.42 Factors taken into consideration in determination of importance of ecological features include, in line with CIEEM guidelines³⁶:

- designations and nature conservation status:
 - o statutory and non-statutory designated sites for nature conservation;
 - o Habitats and Species of Principal Importance for nature conservation in England (NERC Act, s.41);
 - o local BAP priority habitats and species;
 - o RDB species of conservation concern (JNCC, 2019);
 - o Birds of Conservation Concern 5 (Stanbury et al., 2021);
 - o nationally rare and nationally scarce species; and,
 - o legally protected species.
- naturalness;
- animal or plant species, sub-species or varieties that are rare or uncommon, either Internationally, Nationally or more Locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/ or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitat diversity;
- habitat connectivity and/ or synergistic associations;
- habitats and species in decline;
- rich assemblages of plants and animals;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of important natural/semi-natural vegetation types, including examples of naturally species-poor communities;
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change; and,
- ecosystem services/natural capital.

³⁶ CIEEM. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester. 2018.

Evaluation of Impacts

- 8.2.43 An assessment of likely ecological impacts has been undertaken with reference to CIEEM guidelines (2018) for receptors assessed as 'important' and only where clear evidence is available to substantiate and justify the findings. In the absence of such evidence, the precautionary principal has been applied and the effect included as significant in the absence of evidence to the contrary. Impacts have been assessed initially without mitigation in accordance with the approach adopted by CIEEM (2018). Following identification of the scale and magnitude of impacts, mitigation measures have then been proposed that are commensurate with the impacts identified. The impact assessment has then been reapplied to determine the scale of any residual impacts to each ecological receptor, to determine potential residual effects. Only those receptors for which effects are considered significant are carried through to the mitigation stage.
- 8.2.44 A level of significance has been assigned to each predicted effect. The geographic scale of the effects has been estimated on the same geographic scale as set out in paragraph 8.2.39 above. Where an ecological feature falls into more than one category of scale (e.g., a site designated at both the international and national level), then the highest category is always selected for evaluation purposes.
- 8.2.45 Activities likely to generate impacts on ecological receptors have been identified by considering the following:
- the design of the overall Development;
 - desk study information;
 - field survey information; and
 - EIA experience and publications relating to similar projects/ schemes.
- 8.2.46 Activities likely to generate effects were then broadly categorised into the following:
- Site preparation, demolition of existing structures and construction of the overall Development; and
 - operation of the overall Development.
- 8.2.47 The assessment takes account of the effects of impacts on ecologically important features according to the following process:
- identifying and characterising impacts and their consequence;
 - taking account of measures to mitigate for these impacts;
 - assessing the significance of any residual effects after mitigation;
 - identifying appropriate compensation measures to offset significant residual effects; and,
 - identifying opportunities for enhancement, including Biodiversity Net Gain.

8.2.48 In accordance with BS42020: 2013 and CIEEM guidelines³⁷, the following factors have been taken into account for each identified impact on each relevant ecological feature:

- positive or negative;
- extent;
- magnitude (size/ amount/ intensity/ volume);
- duration (short, medium or long-term, permanent or temporary);
- timing/ frequency (occurring at a critical stage in lifecycle, regular or irregular); and,
- reversibility (reversible or irreversible).

8.2.49 In line with the mitigation hierarchy, suitable measures have been recommended to:

- avoid negative ecological effects;
- mitigate to reduce negative ecological effects that cannot be avoided;
- provide compensation to offset effects; and,
- deliver ecological enhancements to achieve net gains in biodiversity.

8.2.50 Assessments have been based on available literature and professional judgement as to whether the integrity (of a site or ecosystem) or the conservation status (of a habitat or species) is likely to be affected; in other words, whether the effect would be 'significant' in ecological terms.

8.2.51 'Integrity' in relation to land lacking a designation or objectives for nature conservation is a long-term concept and defined as follows:

*"The integrity of a site is the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/ or the levels of populations of the species for which it was designated."*³⁸

8.2.52 For habitats, conservation status:

*"... is determined by the sum of the influences acting on the habitat and its typical species that may affect its long-term distribution, structure and functions as well as the long-term survival of its typical species within a given geographical area."*³⁹

8.2.53 For species, conservation status:

³⁷ CIEEM. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester. 2018.

³⁸ UK Government. Appropriate assessment. Planning Practice Guidance. 2019.

³⁹ Conservation of Habitats and Species Regulations 2017.

*"... is determined by the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within a given geographical area."*⁴⁰

- 8.2.54 Each effect is then considered significant at the level at which the ecological receptor is important, combined with the scale at which the impact itself is likely to incur an effect. The ecological importance of a given receptor may not, therefore, be the same as the scale of effect significance.
- 8.2.55 Where ecological constraints to development are identified, mitigation measures that are proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the Development are described. In addition, in accordance with the NPPF and the Environment Act 2021, opportunities for the provision of net gains in biodiversity are provided.
- 8.2.56 Where applicable, suitable monitoring or follow-up arrangements to determine whether mitigation has been successful and to specify appropriate remedial actions have been proposed. Lastly, residual effects are assessed using the aforementioned methods employed for the assessment of unmitigated impacts.

Categorising Significant Effects

- 8.2.57 The CIEEM Guidelines state that an effect should be determined as being significant when it "either supports or undermines biodiversity conservation objectives for important ecological features or for biodiversity in general". Significance is a concept related to the weight that should be afforded to effects when decisions are made, and to the consequences, in terms of legislation, policy and/ or development control. So, a significant negative (adverse) effect on a feature of importance at one level would be likely to trigger related planning policies and, if permissible at all, generate the need for development control mechanisms, such as planning conditions or legal obligations, as described in those policies.
- 8.2.58 An effect on an important ecological feature may be significant at the same geographic scale at which the feature is determined to be important, or at a lesser geographical scale, depending on the characterisation of the impact. By way of example, limited impacts on a woodland of county importance might be assessed as being significant at a local level of importance. This methodology supports an evidence-based approach which supersedes previous matrix-based assessment methodologies.

Conversion to a Matrix-based Approach

- 8.2.59 In order to provide a comparison across the other chapters in this ES, the geographical scale effects have been converted to a scale level of negligible, minor, moderate, and major. Effects are considered to be adverse or beneficial with major and moderate effects considered to be 'significant' and minor and negligible effects considered to be 'not significant'.

⁴⁰ Conservation of Habitats and Species Regulations 2017.

8.2.60 For ease of reference, **Table 8.2** below provides a means of relating the two approaches and is provided in order to allow the Ecology Chapter to be integrated into the wider EIA without compromising the CIEEM best practice approach.

Table 8.2: Criteria for Determining Significance

Criteria	Scale	Nature	Significance
A positive effect (determined by extent, duration or magnitude) significant from county to regional and international level on the status of ecological features of interest	Major	Beneficial	Significant
A limited positive effect (determined by extent, duration or magnitude) significant at local level on the status of ecological features of interest	Moderate	Beneficial	Significant
Positive effect significant at Site level on the status of ecological features of interest.	N/A	N/A	Not significant
No noticeable effect on the status of ecological features of interest.	N/A	N/A	Not significant
Negative effect significant at Site level on the status of ecological features of interest.	N/A	N/A	Not significant
A limited negative effect (determined by extent, duration or magnitude) significant at local level on the status of ecological features.	Moderate	Adverse	Significant
A considerable negative effect (determined by extent, duration or magnitude) significant from county to regional and international level on the status of ecological features of interest.	Major	Adverse	Significant

Assessment of Cumulative Effects

8.2.61 Where other developments are proposed in the vicinity of the Site, there is potential that these could give rise to cumulative effects in combination with the Development.

8.2.62 An overarching list of Cumulative Schemes is provided in **ES Volume 2, Chapter 2: EIA Methodology**. A review of this list was undertaken to identify the schemes that could give rise to cumulative effects and is presented in Section 8.6 of this Chapter.

Limitations and Assumptions

8.2.63 The following section summarises the key limitations and assumptions relevant to the assessment of features of ecological importance. For full details, please refer to the technical reports provided in **Appendices 8.1–8.13**.

Preliminary Ecological Appraisal (PEA)

8.2.64 Small parts of the Site were not accessible, due to it being fenced off, access restricted by vegetation or presence of horses, or considered unsafe as adjacent to busy roads. Aerial imagery has been used to map these areas and a precautionary approach with regard to their assessment has been taken. For areas of woodland, historic woodland data has also been used to aid in assessment. Despite these limitations, it is considered that the PEA accurately reflects the habitats present, their biodiversity importance and the potential of the Site to support protected and otherwise notable species.

Hedgerow Survey

8.2.65 H58 was inaccessible due to horses kept for equestrian purposes that were in the fields. H126 was inaccessible due to its proximity to a dangerous road. Despite this limitation, it is considered that this assessment accurately reflects the importance of hedgerow habitats surveyed under The Hedgerows Regulations 1997.

Bat Survey

Ground Level Tree Assessment

8.2.66 Some trees were unable to be fully surveyed for roost features during the Ground Level Tree Assessment in 2024 and 2025, either due to land access issues or excessive foliage. Therefore, a precautionary approach has been adopted for the purpose of this impact assessment. Trees which were not assessable were denoted FAR (further assessment required) on a precautionary basis and, where confirmed as requiring removal, subject to further climber tree inspection and/or dusk emergence surveys. Therefore, this is not considered to be a significant limitation to the assessment.

8.2.67 The surveys were conducted between May and October 2025. All trees had at least one survey during the optimum survey period (before the end of August). Due to the nature of design iterations and confirmations, it was not possible to conduct two of three surveys during the optimum period and spaced 3 weeks apart (as recommended by the Good Practice Guidelines), with the second and third surveys conducted in September and/or early October (T68, T176, T184, T274, T36 and G2, G3, T4-T9). September and early October are within the recognised active season, and can identify mating or transitional/occasional roosts that would otherwise be missed; however, there is the potential that maternity roosts could have been missed if these have disbanded or switched location prior to the August/September surveys conducted. This has been considered in the assessment and a precautionary approach taken where necessary.

Preliminary Roost Assessment

8.2.68 Internal inspections during the PRA were carried out for 18 buildings (B1, B3–B8, B10, B12, B14, B16–B19, B21–B23, and B27). Access restrictions prevented internal inspections of the remaining 9 buildings (B2, B9, B11, B13, B15, B20 and B24–B26).

8.2.69 The voids could only be inspected partially for B1, B3, B4, B8, B19, B22 and B27 due to access restrictions. Assessments on the suitability of the buildings for roosting bats were made on a precautionary basis taking into account any access restrictions, and therefore this is not considered a significant limitation.

8.2.70 The presence of numerous bird droppings in the western section of B6 made it difficult to identify the presence of any bat droppings. However, this has been taken into account when assessing the building's suitability for roosting bats and is therefore not considered a significant limitation.

8.2.71 Some of the eastern slope on the roof of B24 could not be viewed due to presence of vegetation and a wall meaning a better viewpoint could not be accessed. Therefore, a precautionary assessment of the suitability of the building for roosting bats was made.

Dusk Emergence Surveys

8.2.72 The first and second survey of B18 had possible bat emergences. The IR footage could not be reviewed at the specific times of these potential emergences due to recording errors. Therefore, a precautionary assessment has been made with regard to the evaluation of this building for roosting bats.

Crossing Point Surveys

8.2.73 Two crossing point surveys were conducted covering August and September 2024 which is less than the 6 recommended under Berthinussen and Altringham (2005), for reviewing the effectiveness of mitigation at linear transport route crossing locations. However, the survey protocol was extended both in terms of recording duration (doubled) and by use of static detectors (recording for 10 days). During Discretionary Advice Service consultations Natural England agreed that sufficient information from wider activity surveys across the active flight season, would enable interpretation of likely results from crossing point surveys at different times of the year.

Great Crested Newt Survey

8.2.74 Waterbodies 7, 17, 28, and 42 were dry in 2024, meaning eDNA surveys could not be carried out. The surveys were conducted during the summer months (June), a time when many shallower ponds naturally dry out. A repeat visit the following year in April 2025 revealed that the ponds had remained dry and therefore it is unlikely that the ponds present a suitable breeding resource for great crested newts.

8.2.75 Access to 18 waterbodies (1, 2, 8, 10, 11, 12, 13, 14, 16, 18, 20, 21, 24, 25, 38, 39, 40, and 43) was not possible for survey in 2024. Fourteen of these were offsite and access consent was either not received or denied. Four were within the application boundary, two of which (Ponds 8 and 20) were surveyed in 2025 following successful gated-access arrangements (both found to be dry with low suitability and health and safety concerns). Pond 24 is within a horses paddock and was accessed in 2025, with HSI results indicating poor suitability and no further surveys were considered necessary. One waterbody (Pond 18) was a highways drainage basin within Highways England control. Access was not permitted from the hard shoulder of the A414 for health and safety reasons and it could not be alternatively accessed due to fencing and impenetrable vegetation.

8.2.76 Although overall survey results indicate that GCN are unlikely to be present on site, due to the access restrictions for 15 (mostly offsite) waterbodies, it is not possible to completely rule out that individual/small numbers of newts may be present.

Hazel Dormice Survey

8.2.77 There were no significant limitations to the hazel dormice survey and assessment.

Badger Surveys

8.2.78 Access restrictions meant that most of the scrub and woodland strip along the eastern boundary of the Site, adjacent to the M1 motorway, could not be inspected. The density of the scrub and understorey vegetation in this area is also severely limited visibility from adjacent land.

Barn Owl

8.2.79 Some areas within the red-line boundary could not be fully accessed due to livestock within the fields and under health and safety considerations. These habitats were viewed from a distance using binoculars and this was deemed sufficient for the survey.

8.2.80 Surveys within Building 4 were limited on health and safety grounds. It is in a state of disrepair with an asbestos roof. It is open on the north and so the survey was completed using binoculars from this entrance way using a high-powered torch. This allowed for a good assessment to be made of the building to determine the presence/absence of any PNS or evidence of use by barn owl. Protected species surveys carried out around the building (breeding birds and bats) also revealed no observations of barn owl.

8.2.81 B6 was being actively used to store machinery. It is swept regularly, and so ground-based evidence of barn owls could have been removed. However, the presence/absence of any PNS could be determined from the inspection and faecal staining/ splashes or pellet indicative of use, would likely have been observable higher up in the building if present. Further protected species surveys carried out around the building (breeding birds and bats) revealed no observations of barn owl.

8.2.82 Three of the trees could not be climbed during Stage 2 & 3 surveys and therefore a detailed inspection could not take place. Trees T36, and T80 were unsafe to climb for health and safety reason and T169 could not be accessed. T36 and T80 were subsequently subject to bat emergence surveys where no observations of barn owls were recorded. T169 was surveyed from the ground from the roadside only, using binoculars and features were checked for feathers and pellets.

Breeding Bird Surveys

8.2.83 Land access was an issue on Transect 4 in the west of EH South due to the presence of horses during some survey visits. Timings were adjusted to try and avoid the times when horses were present, but where this was not possible, the survey was undertaken from the boundary of the relevant areas which was generally considered to provide sufficient results to prevent a gap in the dataset.

Wintering Bird Surveys

- 8.2.84 Land access was restricted on Transect 4, where much of the Site in the west of EH South was managed as paddocks. The livery owners requested that surveyors should not enter when horses were being grazed in this area. Timings were adjusted to try and avoid the times when horses were present, but where this was not possible, the survey was undertaken from the boundaries of the affected fields. The fields were, individually, small and this was considered to provide sufficient results to prevent a gap in the data sets.
- 8.2.85 The eastern edge of most of the transects is contiguous with the M1 motorway corridor. As a result, traffic noise was high and may have obscured lower volume or distant bird sounds.
- 8.2.86 Individual birds and different bird species vary in their behaviour and detectability, and it is unlikely that registrations were detected for all birds during each survey visit. Nevertheless, it is considered that the majority of the wintering bird assemblage was recorded over the course of the surveys and the data collected is therefore considered sufficiently robust for evaluating the wintering bird assemblage present within the Site.

Scoping and Consultation

- 8.2.87 An EIA Scoping Opinion was requested from St Albans City and District Council and Dacorum Borough Council, accompanied by an EIA Scoping Report (**ES Volume 3, Appendix 2.1**) summarising the likely significant effect of the Development on the environment.
- 8.2.88 The EIA Scoping Opinion issued by St Albans City and District Council confirmed that Ecology and Nature Conservation should be scoped into the EIA. Specifically, it advised that the assessment should consider lighting impacts on ecology, incorporate comments from Herts and Middlesex Butterfly Conservation, and include the Rivers Gade and Bulbourne, both chalk streams, as receptors within the ES chapter. Similarly, the EIA Scoping Opinion issued by Dacorum Borough Council also confirmed the inclusion of Ecology and Nature Conservation within the EIA and advised that lighting impacts on ecology should be considered. These matters have been addressed: consultation with Herts and Middlesex Butterfly Conservation has taken place and is ongoing, as they are identified consultees in the Scoping Opinion and a lighting strategy has been developed to assess and manage ecological impacts and is provided in **ES Volume 3, Appendix 8.14**. As stated in Section 8.3.12, the Site is located outside the catchment areas of the Rivers Gade and Bulbourne, and as such, there are no identified impact pathways; these receptors have therefore been scoped out of the assessment.
- 8.2.89 Consultation with Natural England was carried out through the Discretionary Advice Service (DAS) to gain their advice with respect to three areas: biological survey methodology, landscape visual impact assessments (ecological mitigation plans) and information for a draft Habitats Regulation Assessment. Relevant information was submitted as part of the DAS request on 20 February 2025, including figures and a supporting document which set out the key questions and advice requested within each of the three areas to be covered. Further updated information regarding protected species (specifically bats, hazel dormouse, and great crested newt) was issued to Natural England on 27 May 2025. A written response was received on 10 June 2025, and the matters were subsequently discussed in a follow-up meeting alongside other species and related issues. Hazel dormouse was initially included

in the DAS request to Natural England based on preliminary on-site acoustic recordings and third-party footprint tunnels evidence from an adjacent site suggesting their potential presence. However, subsequent investigations determined that neither form of evidence was attributable to hazel dormouse. As a result, this species was considered likely absent from site and subsequently scoped out.

8.2.90 Consultation with the Dacorum Borough Council, Hertfordshire County Council and Herts Nature Recovery Partnership was carried out in order to gain their opinion on the proposed scope of surveys and mitigation measures and, where required, put forward alternative strategies.

8.2.91 Consultation with Butterfly Conservation (Herts & Middx Branch) was carried out in response to a scoping opinion request from the Local Planning Authority (LPA). The aim was to gather insights into local butterfly records and distribution, as well as to obtain their views on appropriate mitigation and enhancement measures.

8.2.92 A summary of the key dates and key points / comments is provided below in **Table 8.3**.

Table 8.3: Summary of consultations

Date	Summary of meeting topics	Summary of comments and how these have been addressed
Meetings with Hertfordshire County Council, St Albans District Council, Dacorum Borough Council and Herts Nature Recovery Partnership		
11/12/2024	Meeting to understand the emerging Local Nature Recovery Strategy in respect of the Site Landscaping/Ecology	The Hertfordshire County Council Senior Ecology Officer advised that the Herts Ecological Network (HEN) is a high-level tool not based on detailed, site-specific surveys, and supported using specific survey data for the site instead, as it provides more accurate, context-specific evidence.
21/11/2024	Updates on the ecology progress to date and approach including discussions regarding hazel dormouse, farmland bird mitigation and green buffers	Survey approach and progress discussed and agreed with Hertfordshire County Council Senior Ecology Officer including bats, badger, hazel dormouse, GCN, Breeding birds and BNG. HCC officer noted many (e.g., Mammal Trust) consider hazel dormouse effectively extinct in County. Requirements for green consider widths was not prescriptive but should be context specific, no pervasive minimum imposed. Recommendation for disturbance sensitive/ ground nesting bird mitigation to be off-site to east of M1.
11/09/2024	Discussions regarding the scope of ecological surveys, any findings to date and key issues	Hertfordshire County Council Senior Ecology Officer agreed with the proposed scope of surveys for protected species. Hertfordshire County Council Senior Planning Officer provided feedback on crossing points scope and asked for location 10 to be retained. Location 10 was surveyed in August and September 2024.

Date	Summary of meeting topics	Summary of comments and how these have been addressed
05/03/2025	Feedback from the Local Nature Recovery Strategy Team on development of the strategy and implications for development	Herts Nature Recovery Partnership provided an overview of the habitats of strategic significance in the vicinity of the Site and within the Site. This has been considered in the BNG assessment.
09/05/2025	Requirements for Biodiversity Net Gain, Lighting Assessment details, ecological surveys and mitigation proposals in relation to bats and the HRA approach to air quality impacts on the Chilterns Beechwoods Special Area of Conservation (SAC).	<p>Hertfordshire County Council Senior Planning Officer agreed to separate metric being provided for the Site and the proposed SANG</p> <p>Hertfordshire County Council Senior Planning Officer recommended working alongside the Hertfordshire Guide for Lighting. This has been considered when devising the sensitive lighting strategy for the Site.</p> <p>Hertfordshire County Council Senior Planning Officer agreed with Temple’s assessment that habitats present on Site are of poor quality for barbastelle and considered the crossing point survey effort to date sufficient to assess impacts and inform mitigation.</p> <p>Hertfordshire County Council Senior Planning Officer agreed with proposed HRA approach with regards to screening in air quality in relation to Chilterns Beechwoods Special Area of Conservation (SAC).</p>
Meetings with Butterfly Conservation		
24/06/2025	Mitigation and enhancement measures for invertebrates (specifically butterflies/ moths)	Butterfly Conservation agreed site-specific surveys not required. However, they recommended targeting key species with enhancements to include white letter hairstreak, small blue, dingy skipper and white admiral. Recommended enhancement measures to include planting of Dutch-elm disease resistant elm trees and creation of butterfly banks with chalk grassland. These measures have been agreed in principle; the exact location and quantity of elm planting and butterfly banks will be confirmed at a later stage
Meetings with Natural England		
23/04/2025	Sustainable Accessible Natural Greenspace (SANG), Biodiversity Net Gain provision, and information required for draft (shadow) HRA	Natural England confirmed noise levels thresholds for SANG, the guidelines to use for the creation of SANG, provision of two separate BNG metrics for the SANG area and the remainder of the Site. Natural England advised that air quality could potentially be screened out based on appropriate thresholds but noted that this would ultimately depend on the position of the relevant determining authority

Date	Summary of meeting topics	Summary of comments and how these have been addressed
09/07/2025	Sustainable Accessible Natural Greenspace (SANG) and biological survey methodology	Discussions with Natural England included noise level thresholds for the SANG and feedback on the proposed design of Country Park and Valley Park SANG. Natural England agreed with the timing and level of survey effort for bats, including the approach to crossing point surveys subject to sufficient wider information to enable interpretation across the active flight season, and confirmed that most recent survey data would be taken as the current status for licensing purposes. Natural England also approved the proposed mitigation measures for barn owl.

8.3 Relevant Baseline Conditions

8.3.1 This section describes the ecological baseline and assesses the importance of ecological features relevant to the assessment for the designated sites, habitats and species recorded in this area. It includes field survey data and relevant existing information gathered from the key documents relating to the Site.

Designated Sites

Statutory Designated Sites

8.3.2 There is one international statutory designated site located within 15km of the Site, Chilterns Beechwoods SAC. An additional three sites of national importance have been included in this assessment, since the Site falls within their Impact Risk Zone (IRZ) as follows: Ashridge Commons and Woods Site of Special Scientific Interest (SSSI), Roughdown Common SSSI, Bricket Wood Common SSSI. These sites are shown in **Table 8.4** and are illustrated on Figures 1.2 and 1.3 of the Preliminary Ecological Assessment (**ES Volume 3, Appendix 8.1**). Moor Mill Quarry West SSSI is also located within 15km of the Site and has been scoped out as it was designated for geological reasons.

Table 8.4: Statutory Designated Sites

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation / description
Chilterns Beechwoods SAC	7.8km north-west	International	<p>Annex I habitats that are a primary reason for selection of this site: 9130 <i>Asperulo-Fagetum</i> beech forests</p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (* important orchid sites)</p>

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation / description
			Annex II species present as a qualifying feature, but not a primary reason for site selection: 1083 Stag beetle <i>Lucanus cervus</i>
Roughdown Common SSSI	4.2km west	National	An old chalk quarry forms part of the site and a mosaic of chalk grassland exists amongst adjacent hawthorn scrub. One of Hertfordshire's few remaining examples of unimproved calcareous grassland.
Bricket Wood Common SSSI	4.7km south	National	An important example of lowland heath in Hertfordshire. Part of the site is ancient woodland of the pedunculate oak/ hornbeam type.
Ashridge Commons and Woods SSSI	7.8km west	National	The site comprises a mosaic of different habitats: a mixture of ancient semi-natural and secondary woodland, plantation, scrub, a more open component dominated by bracken, and grassland. The site supports an exceptionally rich breeding bird community including both county and national rarities.

Non-Statutory Designated Nature Conservation Sites

8.3.3 There are 37 non-statutory sites designated as Local Wildlife Sites (LWS) within 2km of the Site. Westwick Row Wood LWS is located within the Site boundary and two sites are partly within the Site boundary: the Nicky Way Dismantled Railway LWS and Disused Railway Line, Hemel Hempstead LWS. These sites are considered to be of **Local Importance** and are shown in **Table 8.5**.

Table 8.5: Non-Statutory Designated Sites

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation/ description
Westwick Row Wood LWS	Within Site	Local	An old, possibly ancient, semi-natural broadleaved woodland with a diverse canopy and understorey, supporting abundant bluebells and other ancient woodland indicator plants. Wildlife Site criteria: Old/ ancient semi-natural broadleaved woodland with a semi-natural canopy and varied structure and field evidence suggesting an ancient origin; woodland indicators.
Nicky Way Dismantled Railway LWS	Partly within Site	Local	A disused railway supports a mosaic of habitats including rough neutral grassland, tall herbs, scrub, and species-rich hedgerows. Wildlife Site criteria: Mosaic; woodland and grassland indicators.

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation/ description
Disused Railway Line, Hemel Hempstead	Partly within Site	Local	A dismantled railway route featuring predominantly old secondary woodland and scrub with small areas of rough grassland and tall herbs. Wildlife Site criteria: Old secondary woodland with a semi-natural character and varied structure; woodland indicators.
Blackwater Wood LWS	240m south	Local	Semi-natural ancient woodland with a canopy of pedunculate oak and ash plus some beech and wild cherry. Woodland indicators present.
Westwick Hall LWS	280m east	Local	Designated due to the presence of protected species within the building and its environs. Records held by HERC for this site include brown long-eared bat and Natterer’s bat.
Potters Crouch Plantation	290m south	Local	Plantation woodland containing ancient semi-natural woodland remnants (including Great Furzefield and Little Furzefield Woods) mainly to the north and around the margins, with 30 Ancient Woodland Indicator species throughout
Holy Trinity Church, Leverstock Green LWS	330m west	Local	Designated because of its grassland indicator species. The churchyard contains old neutral grassland with species including pignut, lady’s bedstraw, burnet-saxifrage, and bulbous buttercup, with scattered old trees.
Kettlewell’s Farm Area LWS	530m east	Local	Designated due to the presence of protected species within the building and its environs. Records held by HERC for this site include roosting brown long-eared bat, serotine and Natterer’s bat.
High Wood (Hemel Hempstead) LWS	630m north-west	Local	Ancient woodland site with some semi-natural canopy and field evidence suggesting an ancient origin, and woodland indicators.
Prae Wood LWS	720m east	Local	Extensive ancient semi-natural woodland site predominantly replanted with conifers or a mix of broadleaf and conifer species of varying ages. Restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features; woodland indicators.
Woodhall Wood LWS	800m west	Local	Ancient semi-natural woodland remnant dominated by a high canopy of ash and wild cherry. Woodland indicators present.
Appspod Wood LWS	850m south-east	Local	Ancient semi-natural woodland largely replanted with pine leaving a belt of broadleaved species around the edge. Woodland indicators present.
Windmillhill Wood and	898m east	Local	The area is designated for its ancient woodland fragments, with a semi-natural canopy and ancient features, with woodland

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation/ description
adjoining woodland LWS			indicator species. There is a landscape avenue and a planted woodland with ancient woodland fragments. Some standards, pollarded and coppiced trees.
Great Revel End Farm LWS	920m north	Local	Site supporting a wide range of species characteristic of old and relatively undisturbed neutral grassland
Widmore Wood LWS	980m west	Local	Designated due to its Ancient Woodland Inventory site with woodland indicators. It features ancient semi-natural oak/hornbeam coppice with standards woodland containing some old marl pits, and a ground flora containing woodland indicator species.
Birch Wood (near Potters Crouch) LWS	1.02km south-east	Local	Ancient semi-natural woodland bisected by a major road, which has been largely replanted with conifers leaving remnant canopy of broadleaved species around the perimeter. Restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features
Redbourn Common LWS	1.16km north	Local	A common mostly supporting semi-improved neutral grassland but with several areas of more acidic grass present.
Bury Wood (near Redbourn) LWS	1.17km north	Local	Ancient semi-natural woodland and woodland indicators.
Maylands Wood LWS	1.17km west	Local	Ancient semi-natural pedunculate oak/ ash woodland with hazel and with rare, coppiced hornbeams. Woodland indicators present.
Gorhambury Cottage Area LWS	1.25km east	Local	Designated due to the presence of protected species within the building and its environs. Records held by HERC for this site include Natterer’s bat.
Gorhambury Icehouse LWS	1.27km east	Local	Designated due to the presence of protected species. The icehouse is situated in the north-west corner of a small area of ancient semi-natural woodland. Records held by HERC for this site include Natterer’s bat.
Long Deans Wood LWS	1.31km south-west	Local	Old secondary woodland with a semi-natural canopy and varied structure; woodland indicators.
Wellfield Spring LWS	1.42km south	Local	Ancient woodland with a semi-natural canopy and field evidence suggesting an ancient origin; woodland indicators.
Temple Cottage Area,	1.45km east	Local	Designated due to the presence of protected species within the building and its environs. Records held by HERC for this site include brown long-eared bat.

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation/ description
Gorhambury LWS			
Ver Valley by Chequer Lane LWS	1.51km north-east	Local	Disused watercress beds plus hybrid black poplar and white willow plantations adjacent to the River Ver. Fen and swamp indicators present.
Rant Meadow Wood/ Bennets End Pit LWS	1.59km west	Local	Old secondary broadleaved woodland with many deep hollows and pits indicating previous digging for gravel. Old secondary woodland with a semi-natural canopy and varied structure; >2ha; woodland indicators.
Featherbed Lane Copse by Serge Hill LWS	1.60km south	Local	Wooded green lane with features of ancient origins; woodland indicators.
Potterscrouch Section LWS	1.63km south-east	Local	Ancient woodland with a semi-natural canopy and field evidence suggesting an ancient origin; woodland indicators
Long Spring (Potters Crouch) LWS	1.65km south-east	Local	Thin strip of ancient woodland mostly replanted with Scots pine and a little beech in the north. A more natural canopy survives around the woodland edge and in an old disused pit in the south. Restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features
Serge Hill Meadow LWS	1.70km south	Local	The best-fit NVC community is MG1e but with strong affinities to MG5
Redbournbury Meadows LWS	1.73km east	Local	Meadows representing one of the finest, sizeable stretches of relatively undisturbed river valley in Hertfordshire. They consist of a mosaic of marsh, grassland and scrub which border the River Ver and its associated streams and ditches. Qualifying criteria include grassland indicators, fen and swamp indicators and birds.
Hay Wood (Holtmere) LWS	1.77km north-west	Local	Ancient broadleaved woodland site with a semi-natural canopy. The ground flora supports numerous indicator species.
Scrubs Wood LWS	1.88km south-east	Local	Ancient semi-natural woodland supporting a high canopy dominated by pedunculate oak. Woodland indicators present.
New Wood (W. of Redbourn) LWS	1.93km north	Local	Small area of ancient semi-natural pedunculate oak woodland, and woodland indicators.

Site Name	Distance and orientation from Site	Ecological Importance	Reason for designation/ description
Park Wood (near Chiswell Green) LWS	1.94km south-east	Local	Large ancient woodland bisected by a road and almost completely replanted with conifers. Restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features; woodland indicators
Piecorner & Hanging Wood LWS	1.99km south	Local	Ancient woodland inventory site with restorable elements of its previous semi-natural character including some semi-natural canopy and ancient features; woodland indicators.

Habitats and Flora

Ancient woodland, ancient and veteran trees

8.3.4 There are 16 areas of woodland within a 2km radius of the Site that appear on the Ancient Woodland Inventory including some within LWSs, with the closest being Blackwater Wood LWS located 240m south of the Site. Whilst ancient woodland is an irreplaceable habitat, it is locally abundant and widespread and is therefore considered to be of **Local Importance**.

Habitats of Principal Importance

8.3.5 There are 147 parcels of Habitats of Principal Importance (HPIs) located within 2km of the Site. These consist of deciduous woodland, traditional orchards, coastal and floodplain grazing marsh, and wood pasture and parkland.

8.3.6 Deciduous woodland is the most frequent HPI within 2km of the Site, with 134 parcels. There are three areas of deciduous woodland recorded as HPI within the Site. These are located within EH North, adjacent to Westwick Row within EH South and in the south-east corner of EH South. The area in the east of EH South forms part of a larger extent of deciduous woodland HPI that is not within the boundary of the Site. However, during the Site visit it was noted the eastern section within EH South does not qualify as deciduous woodland HPI due to it being a plantation woodland and having a lack of variety in species composition in both the canopy layer and ground flora. Deciduous woodland is locally abundant and widespread and is considered to be of **Local importance** and therefore **scoped in** for further assessment.

8.3.7 There are eight parcels of traditional orchard within 2km of the Site, the closest of these is adjacent to the south-west of EH South, along Westwick Row. This habitat is considered to be of **Local importance** and therefore **scoped in** for further assessment.

8.3.8 There are four parcels of coastal and floodplain grazing marsh within 2km of the Site. The nearest parcel is located approximately 1.5km to the north-east of the Site, along the River Ver. The other three parcels are also located along the River Ver to the east of the Site. Floodplain grazing marsh is rare in Hertfordshire and therefore it is considered to be of **County importance** and **scoped in** for further assessment.

- 8.3.9 There is only one area of wood pasture and parkland within 2km of the Site, centred in Gorhambury House, and located approximately 400m to the east of the Site. This is one of a limited number of areas of wood pasture and parkland within Hertfordshire and therefore it is considered to be of **County importance** and **scoped in** for further assessment.
- 8.3.10 There are also 88 hedgerows on Site, of which 86 qualify as HPI. Sixty-one of these hedgerows are also classified as important in accordance with the criteria specified in The Hedgerows Regulations 1997. Given that hedgerows are locally abundant and widespread within the wider landscape, they are assessed as being of **Local importance** and therefore **scoped in** for further assessment.
- 8.3.11 The Site lies within the catchment of the River Ver, which is a chalk stream HPI. This habitat is considered to be of **Local importance** and therefore **scoped in** for further assessment.
- 8.3.12 The Scoping Opinion issued by St Albans City and District Council advised that the Rivers Gade and Bulbourne, both chalk stream HPIs, should be considered as receptors and these habitats are considered to be of **Local importance**. However, the Development is located outside the catchment areas of both rivers, with no potential hydrological connections or impact pathways identified. As such, the Rivers Gade and Bulbourne have been **scoped out** of this assessment.

Habitats

- 8.3.13 The following habitats were identified during the course of the field surveys. For full details refer to **ES Volume 3, Appendix 8.1** as brief summaries only are provided below.

w1g – Other broadleaved woodland

- 8.3.14 There were 13 areas of 'other broadleaved woodland' across the Site, including five areas of plantation woodland. These woodlands support a variety of native and non-native tree species, with varying levels of understorey, ground flora, and deadwood presence. The majority of woodland areas were in moderate condition at the time of the survey, with two areas being in poor condition and two in good condition. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

w1h – Other woodland; mixed

- 8.3.15 An area of mixed woodland was present within EH North. It comprised a mixture of coniferous and broadleaved species and a variety of tree ages, with understorey being denser in the northern end and scarce in the southern end. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

w1h6 – Other woodland; mixed; mainly conifer

- 8.3.16 EH Central contained two areas of mainly coniferous plantation in moderate condition, while another area in poor condition was present within EH South. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

w1f – Lowland mixed deciduous woodland

- 8.3.17 An area of old, possibly ancient, semi-natural broadleaved woodland was located within the west of EH South, forming Westwick Row Wood LWS, and a second area of semi-natural broadleaved woodland was present within EH North. These woodlands qualify as lowland mixed deciduous woodland HPI and are considered to be of **Local importance** and therefore **scoped in** for further assessment.

c1c7 – Other cereal crops

- 8.3.18 The majority of the Site was dominated by intensively managed arable farmland comprising largely broad bean and winter wheat crops. The small area of the Site that lies to the north of Hemel Hempstead Road was surveyed by FPCR in support of the North Hemel Hempstead development for Bloor and Pigeon in 2025⁴¹, and included an additional area of non-cereal crops. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

c1c7 – Other cereal crops, 81 - Ruderal or ephemeral

- 8.3.19 A small patch of ruderal species was located at the edge of an arable field in the west of EH North. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

g4 – Modified grassland

- 8.3.20 Across the Site there were numerous areas of modified grassland. Those in the southern section of the Site were in the form of horse paddocks that were intensively grazed. A few small areas of modified grassland with a longer sward were located around the Site near field boundaries in the east and by farm buildings. There were also areas of modified grassland at road verges which were regularly mown. Modified grassland is considered to be of **Site importance** and has been **scoped out** of further assessment.

- 8.3.21 g3c – Other neutral grassland

- 8.3.22 Small strips of other neutral grassland are scattered across the Site, primarily along roadsides, within islands of vegetation between the M1 motorway and slip roads in the centre of the Site, and near sustainable drainage features. Other neutral grassland is considered to be of **Site importance** and has been **scoped out** of further assessment.

h3d – Bramble scrub

- 8.3.23 Four small areas of dense scrub dominated by bramble are scattered across the Site, associated with field boundaries and roadsides. Bramble scrub is considered to be of **Site importance** and has been **scoped out** of further assessment.

⁴¹ FPCR. North Hemel Hempstead - Biodiversity ES Chapter 13. Report for Bloor Homes & Pigeon 2025

h3f – Hawthorn scrub

- 8.3.24 A small area of dense scrub dominated by hawthorn was located in the west of the Site. Hawthorn scrub is considered to be of **Site importance** and has been **scoped out** of further assessment.

h3h – Mixed scrub

- 8.3.25 There were several areas of mixed scrub, mainly associated with farm buildings and roadside verges. Mixed scrub is considered to be of **Site importance** and has been **scoped out** of further assessment.

h3g – Rhododendron scrub

- 8.3.26 A small patch of dense scrub dominated by cherry laurel was present in the centre of the Site, forming a boundary feature of a residential garden. Rhododendron scrub is considered to be of **Site importance** and has been **scoped out** of further assessment.

r1f – Temporary water bodies, 848 Sustainable drainage system

- 8.3.27 Three adjoining areas of temporary water bodies were present in an inaccessible area in the east of the Site, and another two adjoining areas of temporary water bodies were present in an inaccessible area in the south of the Site, both forming part of a sustainable drainage system. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

32 - Scattered trees

- 8.3.28 Several individual mature and semi-mature trees were located within arable fields; none of these were considered to be ancient or veteran. Scattered trees are considered to be of **Site importance** and have been **scoped out** of further assessment.

u1 – Built up areas and gardens, 828 vegetated garden

- 8.3.29 Vegetated gardens were found associated with the residential areas in the north of the Site. In the majority of these areas the grass was mown short. This habitat is considered to be of **Site importance** and has been **scoped out** of further assessment.

u1 – Built up areas and gardens, 847 introduced shrub

- 8.3.30 There was an area of introduced shrub in the centre of Phoenix Gateway roundabout between Breakspear Way and the A414 in the west of the Site.

u1b – Developed land – sealed surface, u1b5 - Building and u1b6 - Other developed land

- 8.3.31 There were 49 buildings/ structures on Site which include residential buildings, farm buildings, stables, storage facilities and ancillary buildings. The buildings were largely surrounded and connected to areas of hardstanding in

the form of concrete and used for vehicle access. There were also tarmac roads within the Site boundary. These habitats are considered to be of **negligible importance** and have been **scoped out** from further assessment.

u1c – Artificial unvegetated – unsealed surface

- 8.3.32 Areas of artificial unvegetated - unsealed surface were present along the Nickey Line within EH North, around farm buildings in EH North and EH South, and residential buildings within EH Central. These consisted of a gravel pathways and areas to move and store vehicles. This habitat is considered to be of **negligible importance** and has been **scoped out** from further assessment.

u1f – Sparsely vegetated urban land, 510 bare ground

- 8.3.33 An area of bare ground was present in the north of the Site, adjacent to the farm buildings and farmhouse. The area was in use to store farm machinery and materials. This habitat is considered to be of **negligible importance** and has been **scoped out** from further assessment.

h2a - Native hedgerow

- 8.3.34 A native hedgerow consisting of hawthorn was present in the west of the Site adjacent to the A414 (H125). The hedgerow was heavily pruned. However, it qualified as an HPI. However, it did not classify as important in accordance with the criteria specified in The Hedgerows Regulations 1997. The north of Hemel Hempstead Road was surveyed by FPCR in support of the North Hemel Hempstead development for Bloor and Pigeon in 2025⁴² and included an additional native hedgerow (H109), which classifies as important in accordance with the criteria specified in The Hedgerows Regulations 1997. Given that hedgerows are locally abundant and widespread within the wider landscape, they are considered as being of **Local importance** and therefore **scoped in** for further assessment.

h2a5 - Species-rich native hedgerow,

- 8.3.35 There were three species-rich native hedgerows with no standard trees (H112, H114 and H119). Species-rich native hedgerows qualify as HPIs. These hedgerows were also classified as important in accordance with the criteria specified in The Hedgerows Regulations 1997. However, given that hedgerows are locally abundant and widespread within the wider landscape, they are assessed as being of **Local importance** and therefore **scoped in** for further assessment.

h2a5 - Species-rich native hedgerow, 11 - Hedgerow with trees

- 8.3.36 There were 61 species-rich native hedgerows with trees on Site, the majority of which bound and intersect many of the fields within the Site. Species-rich native hedgerows qualify as HPIs. Forty of these hedgerows (H3, H4, H6, H9-H11, H16, H19, H21, H26, H27, H29, H35-H38, H40-H43, H46-H50, H52, H57, H59, H62, H65-H67, H105, H110, H111, H117, H120, H123, H127 and H128) are also classified as important in accordance with the criteria specified

⁴² FPCR. North Hemel Hempstead. Appendix 13.8: Biodiversity Net Gain Assessment Report for Bloor Homes and Pigeon.

in The Hedgerows Regulations 1997. However, given that hedgerows are locally abundant and widespread within the wider landscape, they are assessed as being of **Local importance** and therefore **scoped in** for further assessment.

h2a6 - Other native hedgerow, 11 - Hedgerow with trees

8.3.37 There were 22 other native hedgerows with trees. These hedgerows had less than five UK-native or archaeophyte woody species in a 30m section. All other native hedgerows qualify as HPis as they comprise predominantly native species. Seventeen of these hedgerows (H1, H2, H5, H7, H13, H15, H18, H28, H32, H39, H45, H54, H58, H60, H63, H108, H121) are also classified as important in accordance with the criteria specified in The Hedgerows Regulations 1997. However, given that hedgerows are locally abundant and widespread within the wider landscape, they are assessed as being of **Local importance** and therefore **scoped in** for further assessment.

r2b - Other river/ stream, 50 - Ditch

8.3.38 There are four ditches present on the Site. One in the east of the Site is seasonally wet and was partially dry at the time of survey. The other three are located in the east of EH South. The ditches are considered to be of **Site importance** and have been **scoped out** of further assessment.

Fauna

Bats

Roosting bats

8.3.39 There are five non-statutory sites within 2km of the Site which are designated due to the presence of bats within buildings and their environs, although other protected species such as certain birds or amphibians may also be present. One of the designated sites is an icehouse, which is a classic bat hibernation site. These designated sites are:

- Westwick Hall Local Wildlife Site (LWS) 280m east of the Site, with desk study records indicating presence of brown long-eared bat and Natterer's bat;
- Kettlewell's Farm Area LWS 530m east of the Site, with desk study records indicating presence of roosting brown long-eared bat, serotine and Natterer's bat;
- Gorhambury Cottage Area LWS 1.25km east of the Site, with desk study records indicating presence of Natterer's bat;
- Gorhambury Icehouse LWS 1.27km east of the Site, with desk study records indicating presence of Natterer's bat; and
- Temple Cottage Area, Gorhambury LWS 1.45km east of the Site, with desk study records indicating presence brown long-eared bat.

- 8.3.40 Hedgerows, tree lines, woodlands and open fields provide potential habitat connectivity between these sites and the Site for bats. The M1 motorway (8 traffic lanes) and A414/slip road (4 traffic lanes) to the east of the Site however, present a notable potential barrier/deterrent for bats to the majority of the Site, which lies to the east of these transport corridors. Whilst there are motorway underpasses at Hogg End Lane, Punchbowl lane (and Redbourn Road and the Nickey Line to the north), whether bats associated with these sites use the underpasses to access habitats on the Site is unknown. Land within the application boundary to the east of the M1 motorway (EH East) includes a SuDS basin, grassland and hedgerows of potential foraging value to bats, however, more extensive and higher value habitats are present in closer proximity to these sites associated with the Gorhambury Estate and further afield, along the River Ver.
- 8.3.41 A total of 55 records roosts/ possible roosts of brown long eared bat, pipistrelle species and unidentified bat species were returned by the desk study. One record is from within the Site: from 2014, a possible maternity roost due to hundreds of probable brown-long eared bat droppings recorded in single barn (B6) beneath and in line with the central beam, and evidence of feeding remains. This record is likely from the surveys carried out by Wardell Armstrong in 2014.
- 8.3.42 A desk study of Magic Maps returned 30 records for bat mitigation licences within 6km of the Site boundary, with three of these within 3km of the Site pertaining to resting places of common pipistrelle and brown-long eared bat.
- 8.3.43 The GLTA undertaken in 2024 assessed 432 individual or groups of trees for bat roosting suitability. The survey identified a total of 165 trees with features suitable for roosting bats. Of these, 111 trees were categorised as having suitability for multiple roosting bats (PRF-M) and the remaining 54 as having suitability for individual or very small numbers of roosting bats (PRF-I) based on the features identified. Ninety individual or groups of trees were identified as further assessment required (FAR) as it was not possible to fully assess these trees or potential features from the ground. The remaining 195 trees were assessed as being of negligible suitability. A further 124 trees on the Site could not be assessed due to access issues.
- 8.3.44 The GLTA Surveys undertaken in 2025 on 18 individual trees and four groups of trees on the Site that are due to be removed identified one tree as having potential to support individual bats (PRF-I) and 13 individual trees and two groups of trees as having features which could potentially support multiple bats or maternity colonies (PRF-M). Three individual trees and two groups of trees had no features suitable for roosting bats and the remaining tree (T295) could not be safely assessed from the ground due to the tree being hazardous.
- 8.3.45 Eight trees identified as requiring further surveys during either 2024 or 2025 GLTAs were subject to climbed inspections in 2025. All other trees that needed further inspection were subject to emergence surveys as they were deemed unsafe or impractical to climb. On completion of the inspection the trees were re-classified for their suitability for roosting bats. Two were retained as PRF-M, two were re-classified as PRF-I, one was classified as FAR and the remaining three were re-classified to negligible suitability. The emergence surveys undertaken in 2025 confirmed the presence of a common pipistrelle day roost in Tree 68.

- 8.3.46 Trees within the areas to the north of Redbourn Road within the red line boundary were assessed by FPCR for their suitability to support roosting bats, as part of the ecological baseline assessments conducted for the North Hemel Hempstead scheme⁴³. They were considered unlikely to support roosting bats.
- 8.3.47 Previous surveys confirmed that either T12 or T13 supported a common pipistrelle roost. During a bat activity transect survey in 2014, two common pipistrelles were observed emerging from the vicinity of these trees, although it was not possible to determine with certainty which tree was in use. The low number of bats recorded suggests the presence of a day roost. These trees were subject to a GLTA survey in 2024 and assessed as PRF-M. They were not subject to further surveys in 2025 as they were confirmed as retained within the Development. In the absence of further surveys and based on incidental findings of 2014 surveys, on a precautionary basis it is considered T12 / T13 continue to support a day roost for common pipistrelle.
- 8.3.48 The PRA undertaken in 2024 found approximately 20 brown long-eared bat droppings in B18, which indicates that this is a day roost for brown long-eared bats. No other droppings or individual bats were recorded in any other building during this survey. Previous surveys confirmed that B18 also supported a day roost for common pipistrelle, based on the 2016 dusk emergence survey, which recorded two common pipistrelles emerging from the building. Subsequent dusk emergence surveys undertaken in 2024 and 2025 identified low numbers of common pipistrelle, soprano pipistrelle and three unidentified bats were recorded emerging from and/ or returning to B18. It is likely that two of the unidentified bats were common pipistrelles as three common pipistrelles were recorded emerging from the barn at the same location during the same survey and were flying in a similar way. The third unidentified bat was likely to be a brown long-eared bat as it was recorded 83 minutes after sunset, which is within the range for typical brown long-eared bat emergence time, and from a feature above where the brown long-eared bats dropping were recorded. Based on this results, B18 is considered to continue supporting a day roost for common pipistrelle alongside a day roost for soprano pipistrelle and a day roost for brown long-eared bat.
- 8.3.49 B2 was assessed as having high suitability for roosting bats during the PRA undertaken in 2024. This building was previously confirmed as a common pipistrelle day roost, based on the presence of bat droppings and emergence/re-entry surveys conducted in 2016, during which a single common pipistrelle was recorded re-entering the building on two separate occasions. During one of the surveys conducted in 2025, one common pipistrelle was observed emerging from Building B2, another was seen re-entering, and a further emergence was recorded later. It is not possible to confirm whether these observations relate to the same individual or multiple bats. This building is considered to support a day roost for common pipistrelle.
- 8.3.50 B3 was assessed as having high suitability for roosting bats during the PRA undertaken in 2024. This building was previously confirmed as a common pipistrelle day roost based on a single dropping found in 2016. Further emergence/re-entry surveys conducted in 2016, 2024 and 2025 did not record any bats emerging or re-entering the building. It is therefore considered that this building no longer supports an active bat roost.

⁴³ FPCR. Bat Survey Report. North Hemel Hempstead. Report for Bloor Homes and Pigeon. 2025.

- 8.3.51 The previous surveys in 2014 and 2016 confirmed that the northern void in Building B6 contained numbers of brown long-eared bats droppings that indicated a maternity roost (though this was not confirmed during emergence surveys) as well as feeding remains indicative of a brown long-eared bat feeding roost. In addition, common pipistrelle droppings were recorded at Building B6, and a common pipistrelle was observed re-entering the building during one of the dawn re-entry surveys in 2016, confirming the presence of a day roost for this species. Surveys undertaken in 2024 and 2025 did not identify any droppings or bats emerging from Building B6; however, unidentified bat species were seen flying inside the building during two of the emergence surveys on four occasions with the flight pattern and behaviour indicative of light sampling. Therefore, on a precautionary basis, and given its past usage, a day roost for brown long-eared bats is also assumed present in B6.
- 8.3.52 During the PRA undertaken in 2024, an additional four buildings were assessed as having high suitability for roosting bats (B1, B8, B19 and B27), one building was assessed as having moderate suitability to support summer roosting bats (B24) and five buildings were assessed as having low suitability to support summer roosting bats (B4, B7, B12, B20 and B22). No bats were observed emerging from buildings B1, B3, B4, B7, B8, B12, B19, B20, B22, B24 and B27 during the 2024 and 2025 bat surveys.
- 8.3.53 The PRA undertaken in 2024 identified features with suitability to support hibernating bats including features suitable for crevice-dwelling species such as under lifted roof and hanging tiles, and roof voids suitable for void-dwelling species. There are 14 buildings with low potential for hibernating bats (B1, B2, B3, B4, B6, B7, B8, B12, B18, B19, B20, B22, B24, and B27).
- 8.3.54 Research by O'Malley et al., (2023)⁴⁴ suggests that four emergence recordings within the first hour after sunset may be effective as an indicator of the presence of a barbastelle colonies in woodland, though it was also noted that woodland size may be a constraint on barbastelle colony formation. The static detector located on the southern side of Westwick Row Wood recorded 17 barbastelle passes within the first hour after sunset on one evening in May and therefore it is assumed this woodland was used for roosting by a small numbers of bats at that time. Whilst records of barbastelle were recorded on the static detector near this woodland in other months also, only April (2No.) and July (1No.) also had recordings within 1hr of sunset, suggesting no roost usage at other times of year. Activity was also lower in months around the maternity period. The detector stationed at the woodland in the area of the proposed Country Park in EH North has 3 passes recorded on 2 nights separately in October within the first hour. Whilst this does not meet the threshold, on a precautionary basis the potential for an occasional/transitional barbastelle roost in this location is assumed. Research relating to Bechstein`s bats which have similar woodland structure requirements, notes a 70ha wood is required to support a colony of 20-30 bats (Mathews, et al, 2018)⁴⁵. Westwick Row Wood and the woodland block in EH North are considered to potentially support non-breeding day roosts of Barbastelle bats as indicated by peaks of activity in early and late season.

⁴⁴ O'Malley KD, Schofield H, Wright PGR, Hargreaves D, Kitching T, Bollo Palacios M, Mathews F. 2023. An acoustic-based method for locating maternity colonies of rare woodland bats. PeerJ 11:e15951 <https://doi.org/10.7717/peerj.15951>

⁴⁵ Mathews, F.; Kubasiewicz, L.M.; Gurnell, J.; Harrower, C.A.; McDonald, R.A.; Shore, R.F.. 2018 A review of the population and conservation status of British mammals. Peterborough, Natural England, 702pp. (Natural England Joint Publication JP025, CEH Project no. C06029, C06940)

- 8.3.55 With reference to the bat mitigation guidelines⁴⁶, common pipistrelle, soprano pipistrelle and brown long-eared bats are considered widespread in Hertfordshire based on the rarity categories for south-eastern England. The building roosts identified for these species to date include two-day roosts of brown long-eared bat (B6 and B18), two-day roosts of common pipistrelle bats (B2 and B18) and one day roost for soprano pipistrelle (B18). The tree roosts include individual/ small numbers of common pipistrelle transitional, occasional or day roosts. Based on Table 3.1 in Reason & Wray⁴⁷, these roosts are considered to be of **Site importance** given the widespread nature of these species within south-east England and **scoped out** of further assessment in Environmental Impact terms but considered for legal compliance. The presence of non-breeding day roost(s) for Barbastelle are considered to be of **District importance** and **scoped in** for further assessment.
- 8.3.56 As some buildings on the Site have hibernation potential, summer roosts of common/widespread species are present in three buildings (B2, B6 and B18), and rarer species of bat are known to use the Site, the importance of the hibernation roost resource on-site is precautionary and considered to be of **Local importance** and **scoped in** for further assessment.
- 8.3.57 Additionally, due to the number of trees with PRF categories I and M which may also be assumed to have hibernation potential the tree roosting resource on-site is considered to be up to **District importance** and **scoped in** for further assessment.

Foraging and commuting bats

- 8.3.58 The data search returned a total of 249 records of bats and/or bat roosts from within the past ten years from at least nine species. Species included common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule, Leisler's bat, Natterer's bat, Daubenton's bat, barbastelle and serotine. There were also records for unspecified bats, unspecified pipistrelle species, unspecified *Myotis* species and unspecified *Nyctalus/ Eptesicus* species.
- 8.3.59 There are three areas of deciduous woodland recorded as Habitats of Principal Importance (HPI) within the Site. These are located within EH North, adjacent to Westwick Row in EH South and in the eastern corner of EH South. The area in the east of EH South forms part of a larger extent of deciduous woodland HPI that is not within the boundary of the Site. However, during the PEA site visit it was noted the south-east section within the Site boundary does not qualify as deciduous woodland HPI due to it being a plantation woodland and having a lack of variety in species composition in both the canopy layer and ground flora. All three areas of woodland on Site, however, provide suitable commuting and foraging opportunities for bats locally. There are also four SuDS (sustainable drainage system) ponds located on Site which provide suitable foraging areas for bats.
- 8.3.60 The Nickey Line (Nicky Way Dismantled Railway LWS and Disused Railway Line, Hemel Hempstead LWS), a former railway line now a footpath and cycleway forming a green corridor, cuts across the Site east-west within EH North

⁴⁶ Reason, P.F. and Wray, S. UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield. 2023

⁴⁷ Reason, P.F. and Wray, S. UK Bat Mitigation Guidelines: a guide to impact assessment, mitigation and compensation for developments affecting bats. Version 1.1. Chartered Institute of Ecology and Environmental Management, Ampfield. 2023

and provides a commuting resource for bats, connecting the Site to other suitable habitats off-site to the east and west.

- 8.3.61 The wider landscape to the north, east and south comprises a large proportion of tree and hedgerow-lined arable fields, small and medium size areas of ancient and semi-natural woodland (ASNW) and deciduous woodland, and a network of watercourses and several waterbodies.
- 8.3.62 The Site is surrounded by several areas of woodland classified as Ancient and Semi-Natural Woodland (ASNW) which have good connectivity to the Site via mature tree lines and hedgerows. The closest area of woodland, named 'Blackwater Wood' according to inventory mapping, lies approximately 240m south and has good connectivity providing suitable commuting and foraging opportunities for bats locally. A larger area named 'Prae Wood' is located 820m south-east of the Site. It is designated as a LWS and has connectivity to the east of the Site via mature tree and hedgerow lined fields, and small areas of woodland and via the A4147 underpass. These small pockets of woodland include several found within The Gorhambury Estate which lies just north of Prae Wood.
- 8.3.63 Various waterbodies and watercourses are present within the surrounding landscape. These are likely to provide good foraging and commuting resources for bats locally. Marchmont Pond is located approximately 456m west of the Site and is well connected to the Site via tree lines and hedgerows. Two ponds within Centurion Golf Club approximately 116m and 124m south are well connected to the Site via mature trees and woodland. The River Ver is situated parallel to the Site running north to south approximately 2.65km to the east of the Site. It is connected to the east of the Site by hedgerow and tree-lined fields, and pockets of woodland and by Punchbowl Lane which runs across the Site. There is also connectivity to the rest of the Site west of the M1 motorway by tree-lined roads and The Nickey Line which passes under the motorway.
- 8.3.64 At least seven species of bat were recorded on Site during the dusk emergence surveys including common pipistrelle, soprano pipistrelle, noctule, barbastelle, brown-long-eared bat, Leisler's bat, and bats within the *Myotis* genus. Commuting and foraging common and soprano pipistrelle bats were recorded on Site. Noctules and a *Myotis* species of bat were recorded commuting on Site. One barbastelle was recorded foraging on Site. In general, foraging and commuting behaviour was mostly observed near hedgerows and mature trees near the buildings within EH North and in the west of EH South.
- 8.3.65 During the transect walkovers, four species of bat were recorded within the Site for foraging and commuting activities; common pipistrelle, soprano pipistrelle, noctule and brown long-eared bat. A further seven species; whiskered bat, barbastelle, Daubenton's bat, Leisler's bat, serotine, Natterer's bat, and Nathusius' pipistrelle bats were recorded during the static surveys. Bats were recorded utilising the Site for both commuting and foraging behaviour, with foraging activity most commonly associated with hedgerows, treelines, mature trees, and open field margins.
- 8.3.66 During the crossing point surveys common pipistrelle and soprano pipistrelle were observed foraging and commuting on site. A number of other species were heard but not seen during the surveys including *Myotis* species, noctule, brown long-eared bat and barbastelle. The static detectors deployed at the crossing point locations recorded common pipistrelle as the most frequent species across all locations. Other species recorded were

soprano pipistrelle, Nathusius’ pipistrelle, Daubenton’s bat, Natterer’s bat, Whiskered bat, barbastelle, brown long eared bat, serotine, noctule and Leisler’s bat.

8.3.67 Numbers of individual bats observed during the emergence, nighttime walkover transects and crossing point surveys were however low, indicating that where larger numbers of passes were present on the static detectors these were likely due to individual or small numbers of bats passing the detector multiple times whilst foraging rather than larger numbers of bats passing. A Bat Activity Index (BAI) assessment indicating the average and maximum number of passes per night recorded during the site-wide static detector activity surveys is provided in **Table 8.6** below.

Table 8.6 Rarity Category, Bat Activity Index (passes per night) and EclIA Importance Level for bats on the Site

Species	Rarity Category S/E England*	National Rarity Score*	Local (Hertfordshire & Middlesex) Rarity Score**	Site-wide BAI overall / BAI max)***
Common pipistrelle	Widespread all geographies	1	1	3746 / 6018 (May)
Soprano pipistrelle	Widespread all geographies	1	1	131 / 337 (October)
Brown Long-eared Bat	Widespread all geographies	1	1	7 / 13 (July)
Whiskered Bat	Rarer of restricted distribution	3	3	2 / 10 (May)
Nathusius’ pipistrelle	Rarer of restricted distribution	3	2	1 / 4 (September)
Daubenton’s Bat	Widespread in many geographies, but not abundant in all	2	1	9 / 25 (August)
Noctule	Widespread in many geographies, but not abundant in all	2	2	42 / 120 (August)
Serotine	Rarer of restricted distribution	3	2	4 / 11 (May)
Leisler’s bat	Rarer of restricted distribution	3	2	36 / 67 (September)
Barbastelle	Rarest Annex II species and very rare	4	4	19 / 30 (May and September)
Natterer’s bat	Widespread in many geographies, but not abundant in all	2	2	2 / 4 (May, June and August)
	Total	23	17	N/A

*From Bat Mitigation Guidelines (Reason and Wray, 2025)

** From Hertfordshire and Middlesex Bat Group

*** BAI Overall is the total number of passes divided by the total number of survey nights overall. BAI maximum is the highest number of passes recorded over one survey / number of survey nights in that survey event.

- 8.3.68 The majority of the recorded activity related to common pipistrelles. These were observed foraging and commuting primarily along hedgerows and tree lines across the Site. Areas of particular focus were around Westwick Row Wood (EH South), hedgerows east of Cherry Tree Farm in EH North, the Nickey Line and the woodland in the north-east of EH North, where high numbers of passes were recorded during the activity surveys. Static detectors deployed as part of the crossing point survey in August and September also recorded their highest numbers along Cherry Tree Lane and Punchbowl Lane in EH North.
- 8.3.69 Common pipistrelles were recorded on multiple occasions close to the mean emergence time in relation to sunset (Collins, 2023): in the north of the Site around Wood End Farm and Wood End Farm Cottages; in the centre-east of the Site (near Breakspear Way / M1 slip-road); and in the south of the Site (near Westwick Row Farm and Corner Farm). These recordings indicate common pipistrelle roost(s) nearby these buildings. Common pipistrelle roosts were recorded in Wood End Farm Cottages and Westwick Row Farm and so records within typical emergence times near these buildings may be from individuals roosting in these buildings.
- 8.3.70 Far fewer passes of soprano pipistrelle were recorded at the Site. Activity levels were highest on the Nickey Line, with a large spike in passes in October, and on the opposite side of the M1 close to the balancing pond south of the junction with the A414. Here, the number of passes recorded was significantly higher in August compared with other months. The marked spike in activity in these months suggest the features may be of seasonal value for the species for commuting and foraging. There is a known day roost within B18 at Westwick Row in the south and bats were recorded foraging in this area and near B27 close to emergence time. Soprano pipistrelles were also recorded on several occasions close to the mean emergence time in the north of the Site (near B2) and in the centre of the Site (near B24), although activity levels here were generally low.
- 8.3.71 Brown long-eared bats were predominantly recorded within higher quality foraging habitat such as the Nickey Line and in proximity to the woodland in the north-east of the Site (EH North) and Westwick Row Wood in the south. Data from the crossing point statics also show a smaller peak in activity along Cherry Tree Lane in the north, and Westwick Row (close to Westwick Row Farm and Corner Farm) in the south, close to where a day roost has been confirmed (in B18). A day roost is also confirmed in B6 at Wood End Farm in the north, close to the Nickey Line.
- 8.3.72 Low numbers of Nathusius' pipistrelle passes were recorded during the activity and crossing point static survey. A slight peak of activity was observed on the statics in October along the vegetated bund adjacent to the M1 motorway in EH South and may suggest some importance to low numbers of bats for commuting - Nathusius' pipistrelle is a migratory species, and most bats are encountered in autumn, although some do remain all year and breed in the UK. Other areas with higher activity were the hedgerow habitat to the north of the A414 Breakspear Way in EH Central, and on the opposite side of the M1 close to the balancing pond where there was a small spike in activity in June.

- 8.3.73 Serotine passes were recorded on Site in relatively low numbers with most activity in May and August. Activity was primarily focused on the woodland in the north-east of the Site (EH North), particularly in May, and around the balancing pond on the opposite side of the M1 motorway (EH Central).
- 8.3.74 Noctule activity was observed across the Site in most months in modest numbers. Most activity was detected around the balancing pond on the opposite side of the M1 motorway, especially in July and August. Crossing point static data also revealed hotspots of activity at Hogg End Lane and, to a lesser extent, at the A414 Breakspear Road monitoring location in September. Noctules were recorded twice close to the mean emergence time in the north of the Site (near Wood End Farm) and in the south of the Site (near Westwick Row Farm) during emergence surveys which could suggest a small roost nearby; however, general activities levels in these areas were not markedly higher than elsewhere on Site.
- 8.3.75 Leisler's bat activity was recorded in modest numbers across the Site and relatively consistently across all months. Areas with highest activity were the woodland in the north-east of the Site (EH North) and around the balancing pond on the opposite side of the M1 motorway. A smaller peak of activity was recorded in August along Cherry Tree Lane on the western boundary of the Site (EH North) and at Westwick Row Wood in April.
- 8.3.76 Daubenton's bats were recorded across the Site with most activity around Westwick Farm (EH South) and hedgerow habitat to the east of Cherry Tree Farm (EH North). Significantly more activity was recorded in August and September than other months with very little activity in these locations during other months. This suggests the activity is unlikely to be associated with a breeding roost in nearby farm buildings.
- 8.3.77 Low numbers of Natterer's bat passes were recorded on Site, primarily in the vicinity of the Nickey Line to the west, along the vegetated M1 motorway bund in the south-western corner of the Site and, to a lesser extent, around the woodland in the north-east of the Site. Slight peaks in activity were observed in May and August. Activity is consistent with small numbers of bats utilising the Site for foraging and commuting purposes.
- 8.3.78 Barbastelle passes were recorded in most parts of the Site across the survey season in low number. Peaks in the number of calls recorded were observed along the Nickey Line, along Cherry Tree Lane and in association with woodland at Westwick Row Wood and in the north-east of EH North. Notable numbers of passes were also detected on the static placed along Redbourn Road in September as part of the crossing point survey. Activity levels showed two seasonal peaks in May and September/ October. Numbers of passes are consistent with low numbers of bats using the higher quality, dark wooded habitats for both foraging and commuting. Barbastelles were recorded twice close to the mean emergence time in relation to sunset (Collins, 2023) in the north of the Site (near Wood End Farm) during emergence surveys, which may also suggest small roosts close by.
- 8.3.79 A summary of the main locations and features associated with each species of bat recorded on the Site as informed by the surveys is provided in **Table 8.7** below.

Table 8.7: Key locations/features of bat activity and months of highest activity for each bat species present on the Site

Species	Key Location/Feature	Months with highest activity	Notes
Common pipistrelle	Nickey Line (EH North); NE woodland (EH North); Hedgerows east of Cherry Tree Farm (EH North); Westwick Row Wood (EH South); Cherry Tree Lane (EH North); Punchbowl Lane (EH North)	May, Jun, Jul, Aug	
Soprano pipistrelle	Nickey Line (EH North); Balancing pond area E of M1 (EH Central)	Aug, Oct	
Nathusius' pipistrelle	Balancing pond area E of M1 (EH Central); Hedgerows W of Breakspears (EH Central); vegetated bund along M1 in centre of EH South	Jun, Aug, Sept	
Brown long-eared bat	Nickey Line (EH North); NE woodland (EH North); Westwick Row Wood (EH South); Cherry Tree Lane (EH North); Westwick Row hedgerows / treelines (EH South); hedgerows/tree lines near Corner Farm on A4147 (EH South)	Jul	Small peak activity in July but fairly uniform across season except April and Oct which are lower
Daubenton's bat	Westwick Row hedgerow/treelines (EH South); Hedgerows east of Cherry Tree Farm (EH North); along Punchbowl Lane and Hogg End Lane (EH North/Central).	Aug, Sept	The highest activity was recorded along hedgerow/treelines on Westwick Row and to a lesser extent east of Cherry Tree Farm, Punchbowl Lane and Hogg End Lane, but peak levels were not markedly higher than at some other locations such as Westwick Row Wood, the vegetated bund along the M1 in the south of the Site.
Natterer's bat	Nickey Line (EH North); NE woodland (EH North); vegetated bund along M1 in SW corner of Site (EH South)	May, Aug	Small peaks in crossing point static data also at Nickey Line, Hogg End Lane close to M1, and hedgerows/tree lines near Corner Farm on A4147 (EH South)
Whiskered bat	Westwick Row Wood	Apr and Jul	Small peaks – only 5 and 8 passes respectively
Noctule	Balancing pond area E of M1 (EH Central)	Jul, Aug	Crossing point statics also showed a peak in activity at Hogg End Lane

Species	Key Location/Feature	Months with highest activity	Notes
			and A414 Breakspear Way (EH Central)
Leisler's bat	Nickey Line (EH North); Balancing pond area E of M1 (EH Central)	Jul, Aug, Sept	Crossing point static data also showed a peak in activity on Cherry Tree Lane (EH North)
Serotine	Nickey Line (EH North); Balancing pond area E of M1 (EH Central)	May, Aug	Crossing point static data also showed a small peak in activity on B487 Redbourn Road
Barbastelle	Nickey Line (EH North); NE woodland (EH North); Westwick Row Wood (EH South); Westwick Row hedgerows/treelines; Cherry Tree Lane	May, Sept, Oct	Crossing point static data also showed a peak in activity on B487 Redbourn Road

8.3.80 The Site was assessed as having high suitability to support bat commuting and foraging activity with connectivity to the wider landscape. The bat assemblage includes common and soprano pipistrelle and brown long-eared bat (all widespread), Natterer’s bat, Daubenton’s bat and noctule (widespread but less abundant), whiskered bat, Nathusius’ pipistrelle, serotine and Leisler’s bat (rarer or more restricted in distribution), and barbastelle (a rare, Annex II species). With reference to the Bat Mitigation Guidelines (Reason and Wray, 2025), based on the diversity of species present on site and their conservation status, for South-eastern England, the bat assemblage at the Site, meets the threshold for National importance. However, as per these guidelines, this has been assessed on the basis of the status of bats in Hertfordshire and Middlesex, based upon local abundance as documented by Hertfordshire and Middlesex Bat Group.⁴⁸ Therefore, the bat assemblage using the Site for foraging and commuting is assessed as **Regional importance** and **is scoped in** for further assessment.

Great Crested Newt

8.3.81 The data search did not return any recent (less than 10-years old) records of great crested newts; however, there were seven historic (more than 10-years old) records within a 2km radius of the Site, the most recent being from 1999 located approximately 440m from the Site. There are no records of European Protected Species licence returns for ponds within 2km of the Site. The majority of the Site falls within the green zone of the Natural England District Level Licensing (DLL) scheme for Hertfordshire indicating that great crested newts are likely to be sparsely distributed in this area. However, the northern extent of the Site falls within the amber zone, where waterbodies 1, 2 and 42 are located. In this zone there is a moderate likelihood that great crested newts are present based on habitat suitability and modelled distribution. FPCR conducted HSI and eDNA surveys for the North Hemel

⁴⁸ <https://hmbg.org.uk/bats-in-hertfordshire-middlesex/>

development in 2023 and 2024, which revealed no evidence of great crested newt and HSI surveys considered ponds to be of below average score for HSI.

- 8.3.82 Wardell Armstrong conducted great crested newt HSI and eDNA surveys in 2015, which revealed no evidence of great crested newt. The desk study identified a total of 49 waterbodies ponds, either within the Site boundary or within 500m of the Site boundary. A total of 13 waterbodies (8, 9, 17, 18, 19, 20, 23, 24, 28, 29, 30, 31 and 32) were located within the Site boundary, while a total of 36 were located within 500m of the Site boundary.
- 8.3.83 The Site is largely sub-optimal for great crested newts, with habitats present within the Site that are suitable to support terrestrial great crested newts include woodland, scrub, grassland and hedgerow bases. There are also rubble piles and deadwood in various locations across the Site which provide suitable habitat for hibernation. There is limited connectivity to waterbodies present within 500m of the Site via hedgerows and field margins. To the east of the Site lies the M1 motorway, which acts as a major barrier to great crested newt movement; however, there are two underpasses (Punchbowl Lane and Hogg End Lane) that go under the motorway and provide some east/west connectivity.
- 8.3.84 Of the nine ponds subject to eDNA (i.e. three onsite and six off-site) none were found to support great crested newts. All other ponds were either inaccessible, dry and/or otherwise scoped out (e.g., due to lack of habitat connectivity with the site). Of the three located within the DDL amber zone (all off-site), one was scoped out from further survey due to being dry (Pond 42), one had no access (Pond 2) and one was only subject to HSI (Pond 1) due to access limitations.
- 8.3.85 The desk study returned no recent records of great crested newts and the Site is considered largely sub-optimal for this species in its terrestrial phase. However, as a large number of waterbodies could not be accessed for survey and two of these ponds are located within an amber risk zone (see 8.3.84) the presence of small numbers/individual GCN cannot be ruled out. As a result, it is assumed that the presence of GCN is unlikely, and if found would be unlikely to be of anything more than **Site importance**. They are therefore **scoped out** of further assessment in EIA terms but are considered for legal compliance within section 8.4.6.

Hazel Dormouse

- 8.3.86 Nest tube surveys undertaken in 2024 identified no evidence of hazel dormice being present; however, returns from the British Trust for Ornithology (BTO) following their automated analysis of acoustic calls from static bat detectors, suggested hazel dormice calls had been recorded.
- 8.3.87 Subsequent consultation with the BTO was undertaken and sound files assigned by the automated process as being hazel dormouse with an above 0.5 confidence level were manually assessed by Dr Stuart Newson (a senior research ecologist in data science and bioacoustics at the BTO). Dr Stuart Newson concluded from his analysis of the recordings that none were correctly assigned as hazel dormice. All of the calls were considered to be "confusion sounds", either due to the location of the static detectors or from confusion with either brown rat calls or poor quality *Nyctalus* bat species calls. Additionally, third-party survey results (detailed below) confirmed the presence

of edible dormouse *Glis glis*, in adjacent areas, which is another species known to produce calls that can lead to misidentification.

- 8.3.88 Surveys conducted in 2024 by a third party on a small adjacent parcel of land for a potential planning application.⁴⁹ which lies opposite the Site, on the other side of Westwick Row, initially suggested hazel dormice were present at that location, with footprints consistent with those of dormice species recorded from 30 of the 50 footprint tunnels during the first check completed in August 2024 across the three species-rich, intact hedgerows. However, while the footpads had the characteristic triangular shape of hazel dormouse, they were larger in size and were suspected to have been produced by edible dormouse, a non-native species with a well-established distribution in the local area. Unpublished data provided by the Crown Estate confirmed that eight Bushnell infrared trail cameras and eight footprint tunnels were set up across the three hedges and surveys were completed over the period between August and September 2025. Camera footage confirmed the presence of edible dormouse entering the footprint tunnels, with no hazel dormice recorded during the monitoring period and were therefore considered absent.
- 8.3.89 The areas of woodland, hedgerow and scrub across the Site comprise pedunculate oak, hazel, hawthorn, blackthorn and bramble, and provide potential cover and a food source for hazel dormice. Significant landscape features in the wider surroundings include blocks of woodland which are connected to the Site through hedgerows. This includes Blackwater Wood, located around 240m south of the Site. A larger area named 'Prae Wood' is located 820m south-east of the Site. It is designated as a LWS and has connectivity to the east of the Site via mature tree and hedgerow lined fields, and small areas of woodland. The M1 motorway running north-south to the east of the Site is likely to provide a significant barrier to dispersal.
- 8.3.90 In England hazel dormice have shown declines in both numbers and distribution over the last 100 years, with recent data suggesting the species has become extinct in about half of its former distributional range.⁵⁰ Dormice are now largely confined mostly to southern England and Wales and are regarded as lost from Hertfordshire where the Site is located. However, all the counties adjacent to Hertfordshire remain within the known current range of the species and/ or have been the focus of reintroduction efforts.
- 8.3.91 Given the lack of confirmed records of hazel dormouse within the Site or its immediate surroundings and considering the fact that the Site is located within the species' historic range, hazel dormouse is considered to be likely absent from the Site and is **scoped out** of further assessment.

Badger

- 8.3.92 The data search returned 110 records of badger from within the past ten years. The most recent of these is located 2km to the south-east in 2022.

⁴⁹ Applied Ecology Ltd Land west of Westwick Row, Leverstock Green, Hemel Hempstead Ecology Report 2024

⁵⁰ Bullion, S., Wolton, R. & White, I. Hazel Dormouse Conservation Handbook. Third Edition. The Mammal Society. 2025.⁵¹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Additional Targeted Raptor and Owl Report. 2019.

- 8.3.93 The Site comprises extensive areas of arable field with pockets of woodland within EH North and EH South, which are well-connected to Site via hedgerows and tree lines. These habitats are likely to provide important resources for badgers both on Site and in the wider surrounds, featuring numerous opportunities for the construction of setts and a large and moderate diversity of foraging resources. While large extents of suitable habitat are present to the east of the Site, they are separated by the M1 motorway, which is considered a major, although not complete, dispersal barrier.
- 8.3.94 The walkover survey recorded a total of 42 active, four partially active, and two disused setts within the survey area. A range of badger field signs including fresh and old latrines, snuffle holes, mammal pathways and badger hairs were recorded across the Site but were most frequently associated with the areas of woodland and hedgerows.
- 8.3.95 The active badger setts identified during the walkover included eight main setts (Sett A-C, TEM5, 18, 31/14, 37, 11, TEM14 and 5), seven annex setts (Sett E, D, F, H, 35, 66 and 6), one subsidiary sett (Sett 70) and 26 outlier setts. The partially active and disused setts consisted of six outlier setts.
- 8.3.96 The bait marking survey carried out in spring 2024 subsequently concluded that Setts TEM5 and 18 were not main setts, with Sett TEM5 being classed as disused and Sett 18 being an annex sett associated with main sett A-C. As such there are six main setts present within the survey area with three of these being present within the redline boundary of the Site; Sett A-C within EH North (Area A), Sett 31/14 within EH Central (Area B) and Sett TEM14 within EH South (Area C).
- 8.3.97 The survey showed that the Site was utilised by five different family groups for foraging. Three family groups were recorded as holding territories within EH South (Sett 5, sett 11 and sett TEM14), a single family group was found to hold a territory within EH Central (Sett 31/14), with another family group holding a territory within EH North (Setts A-C and 18).
- 8.3.98 Badgers from a sett outside of the Study Area within the North Hemel development were found to use the hedge boundary to the north of Redbourn Road, but do not appear to cross over the road. This indicates that Redbourn Road is a territorial boundary between this family and the one holding territory within EH North.
- 8.3.99 Given that badgers are common and widespread in the Hertfordshire countryside, and taking into account their legal protection, the five badger groups using the Site for sett-building and foraging are considered to be of **Local importance** and therefore have been **scoped in** for further assessment.

Barn Owl

- 8.3.100 Barn owl is a Schedule 1 species due to its vulnerability to disturbance affording the highest level of protection under the Wildlife and Countryside Act (1981, as amended). Barn owl is also a Species of Principal Importance (SPI) under Section 41 of the Natural Environment and Rural Communities Act, 2006.

- 8.3.101 The HERC provided 17 records of barn owl which informed the 2019 Additional Targeted Raptor and Owl Report⁵¹. The 17 barn owl records included five breeding records, the most recent record was from 2012 with the nearest being approximately 1km east of the Site. Consultation with the Barn Owl Conservation Network (BOCN) was undertaken and they provided more detailed and recent barn owl breeding records, confirming 12 breeding records within 2km in the last 5 years (from 2019) and confirming an occupied breeding site at Kettlewells Farm, approximately 500m east of the Site. This site was un-occupied by barn owl in the first half of 2019, as the nest box was occupied by starlings; however, later in the year the box became re-occupied by breeding barn owl.
- 8.3.102 Barn owl surveys were undertaken in 2015-16⁵² and in 2019 as part of targeted raptor and owl survey/assessment⁵³ following barn owl being recorded within the wider suite of breeding bird surveys undertaken at that time between March-June 2019.
- 8.3.103 The surveys undertaken in 2015-16 comprised Stage 1, Stage 2 and Stage 3 survey in accordance with best practice guidelines⁵⁴ (Shawyer, 2011). Surveys comprised a mix of climbed inspection and vantage point surveys where trees could not be safely climbed or accessed. Buildings and trees with suitability for nesting were recorded.
- 8.3.104 During the Stage 1 survey, over 300 individual trees, 160 tree groups and five woodlands were reviewed. Of these, 21 individual trees and 2 tree group were identified that had features suitable to support barn owl. It was possible to fully inspect those features suitable to support barn owl within three of the 21 trees and no signs of use by barn owl were identified. It was possible to partially inspect those features suitable to support barn owl within four trees and one tree group (i.e., G145). It was not possible to inspect those features suitable to support barn owl within 12 trees. Whilst one tree had whitewash on its exterior, this could not be identified to a species and a buzzard nest was recorded in another of the trees.
- 8.3.105 It was considered that no evidence of barn owl breeding was identified on the Site during the surveys. Tree group G145 included a mature ash with barn owl pellets and a barn owl feather recorded. Based on the age they were classified as indicating a TRS and very low occasional winter usage.
- 8.3.106 A total of 10 groups of building complexes (B1, B3, B4, B6, B7, B8 and B9) were identified within the survey area during the Stage 1 scoping survey, three buildings (B2, B5 and B9) were subject to internal inspection after the other seven were scoped out. No evidence of current occupation was found in any of the buildings. Full details of buildings B1, B3, B4, B6, B7, B8 and B9 were not available within the report⁵⁵. The report did not confirm conclusively suitability for nesting and roosting across all structures and though no evidence was recorded the structures shown appear to show suitability for either roosting or nesting.
- 8.3.107 No barn owl observations were made during other dusk or dawn field surveys between 2015-16 and the presence of barn owl undertaking foraging and commuting activity had not been recorded.

⁵¹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Additional Targeted Raptor and Owl Report. 2019.

⁵² Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Barn Owl Survey Report. 2017.

⁵³ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Additional Targeted Raptor and Owl Report. 2019.

⁵⁴ Shawyer, C. R. Barn Owl *Tyto alba* Survey Methodology and Techniques for use in Ecological Assessment: Developing Best Practice in Survey and Reporting. 2011

⁵⁵ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Barn Owl Survey Report. 2017.

- 8.3.108 At that time (2015-17) barn owls were known to be breeding in the local area (with the nearest record being at Kettlewells Farm, Gorhambury, 380m east of EH East. EH North, EH Central and EH South were deemed to have an occasional barn owl 'winter' presence that was considered likely to be either a dispersing juvenile or sub-adult from the wider countryside to the north or south of the Site.
- 8.3.109 Barn owl were not recorded during the breeding bird surveys in 2019; however, during bat surveys during that time barn owl were observed foraging over EH South and EH East for the first time. VP surveys were undertaken as part of targeted surveys for barn owl⁵⁶. These recorded an adult barn owl hunting over arable fields in EH South and carrying prey to a tree line near Westwick Row which was likely provisioning a nest site. Stage 3 climbing inspections of trees identified a confirmed nest site with three young present.
- 8.3.110 In May and June 2019 barn owl foraging and commuting activity was recorded in EH Central, South and East.
- Barn owl were recorded flying over EH Central and south over the A414 Breakspear Way between EH Central and EH South and heading in the direction of the M1 motorway verge.
 - Barn owl in flight over EH East at 23:00 over field and SuDS pool south of the Hogg End Lane M1 motorway underpass.
 - Adult Barn Owl observed hunting over arable fields in EH South.
 - Adult Barn Owl observed hunting over arable fields in EH South and carrying prey towards tree line south of Westwick Row.
- 8.3.111 Wintering bird surveys were undertaken 2024-25, breeding bird surveys in 2024 and targeted raptor surveys, which included barn owl as a target species in 2024. Barn owl were not recorded during any of these surveys.
- 8.3.112 A stage 1 assessment of trees suitable for nesting barn owl was undertaken alongside ground level tree assessment (GLTA) for bats. There were 13 trees that were identified as having the potential to support features barn owl might use for nesting or roosting. These trees were subject to climbed tree inspections in July 2025. T141, located within EH South, was confirmed to be an Occupied Breeding Site. A nest of four eggs was observed in a trunk cavity, alongside 2-3 owl pellets and moulted barn owl feathers. No evidence of barn owl was recorded in any of the other 12 trees subject to survey.
- 8.3.113 The suitability of structures to support nesting or roosting barn owl was broadly assessed during the Preliminary Roost Assessment (PRA) for bats. Detailed survey for barn owl of roosting resource (trees and buildings) including Stage 2 and 3 survey and Potential Foraging Habitat (PFH) for additional areas introduced following updates to the red line boundary were undertaken alongside these surveys for the original trees identified as having potential, between June and August 2025. No additional trees were found to be confirmed breeding sites.

⁵⁶ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Additional Targeted Raptor and Owl Report. 2019.

- 8.3.114 Following additional changes to the red-line boundary to include land north of Redbourn Road, data from surveys for the North Hemel proposed development, undertaken in April – July 2023 and again in April – July, were reviewed. No evidence of barn owls or potential barn owl breeding sites was recorded within this area.
- 8.3.115 Based on the previous survey findings it is considered likely the Site supports three breeding pairs. The nests of two pairs are located on Site, with the nest of the third off-site near EH East. Barn owl activity recorded in EH East was likely from an occupied nest 380m east and activity in EH Central and EH South from birds from the occupied nest recorded within EH South (within tree line to south of Westwick Row), in addition to the occupied nest recorded in T141. This assessment is based on extensive survey information collected between 2015 and 2025.
- 8.3.116 The Site is 356.8ha in size. There is suitable foraging habitat present (grassland) and a mix of other habitats providing commuting features and potential grassland edges or habitat for prey species (hedgerow, woodland and scrub). The UKHab survey undertaken in March, April and July 2024 identified there were a few small areas of modified grassland comprising 36.93ha found around the Site near field boundaries in the east and by farm buildings. Species included dominant perennial ryegrass, frequent curled dock, creeping thistle and spear thistle, occasional wild carrot and, rarely, ribwort plantain and burdock. These areas were not frequently mown.
- 8.3.117 A small strip of other neutral grassland is present at a roadside verge within EH North. Another strip is present near a road and path at a field edge in the east of the Site. The extent of other neutral grassland comprises 7.84ha. The total grassland habitat recorded on Site comprised 44.77ha.
- 8.3.118 The habitat surveys recorded 17.37km h2a5 - Species-rich native hedgerow with trees, 6.41km h2a6 - Other native hedgerow with trees and 0.03km w1h - Other woodland; mixed 34 - Ecologically valuable line of trees which totals 23.81km of suitable linear habitat for commuting barn owl with the potential for nesting or roosting suitability depending on the age and structure of the trees. There is additionally the potential for habitat immediately adjacent to support prey species and foraging barn owl.
- 8.3.119 Barn owl can reach high densities within arable landscapes, though research has shown that they only infrequently hunt within the crops themselves because they do not directly provide suitable conditions for prey, the arable landscape often indirectly provides prey rich habitat in the form of grassy margins along the edges of fields (Barn Owl Trust, 2012). Rough grassland in arable landscapes is usually in field margin strips rather than patches. It has been estimated that barn owls require about 35km of rough grass margin 4-6m wide within 2km of the nest in order for the population to be self-sustaining. Where patches of rough grassland do exist in the arable landscapes it is estimated that barn owl require between 14 – 21ha within 2km of the nest. In the wider arable landscape between 1.1 and 1.7% of the total land area needs to be rough grassland (Askew, 2006).
- 8.3.120 The total grassland habitat recorded on Site comprised 44.77ha. The potential foraging habitat has not been classified and will be undertaken within ongoing ecology surveys on Site including Stage 1, 2 and 3 barn owl survey and PFH classification.
- 8.3.121 Using the precautionary principle this assessment assumes that the 44.77ha of grassland comprises Type 1 (optimal) habitat. The habitat is likely to comprise a mix of Type 2 (sub optimal) and Type 3 (poor) which will be

determined following further survey. 44.77ha of foraging habitat based on Askew (2006) can support up to two breeding pairs undertaking a nesting attempt (within 2km).

- 8.3.122 Based on this precautionary approach to habitat suitability and previous survey data, including observations of barn owl, it is estimated that the Site can support either fully or in conjunction with surrounding habitat up to three breeding pairs undertaking a nesting attempt and it is likely this has been the case during the period of survey.
- 8.3.123 In Hertfordshire barn owl are considered to be a frequent breeding resident (Transactions of the Hertfordshire Natural History Society, 2024). The Hertfordshire 2023 Bird Report stated there were a total of 215 reports that year which was similar to the previous two years suggesting a stable population.
- 8.3.124 It is considered that the breeding barn owl population on Site and functionally linked habitat is of **Local importance** and is **scoped in** for further assessment.

Breeding Birds

- 8.3.125 Assessment of the Site for Schedule 1 birds is addressed within the section pertaining to barn owl and raptors. The likelihood of the Site supporting other Schedule 1 species has been scoped out due to an absence of suitable habitats. Desk study records of Cetti's warbler and black redstart were reported within the data search. These species are not anticipated to be present on Site due to an absence of suitable habitats and ecological features to support them during the breeding period.
- 8.3.126 Desk study information pertaining to protected sites relevant to breeding birds was reviewed. The desk study identified one statutory designated site within the zone of influence, Ashridge Commons and Woods SSSI which has the diverse breeding bird assemblage included in the citation. In total, 26 non-statutory sites are present within 2km of the Site that either include mention of ornithological interest in their citation, or are considered to provide opportunities for significant bird assemblages and/or notable species. Of these, three non-statutory designated sites are located either fully or partially within the Site boundary. Westwick Row Wood LWS is located fully within the Site boundary and Nickey Way Dismantled Railway LWS and Disused Railway Line, Hemel Hempstead LWS are partly located within the Site boundary.
- 8.3.127 A review of the survey data for the proposed North Hemel development, relating to the additional land North of Redbourn Road⁵⁷, concluded that this does not add any additional constraints relating to breeding birds.
- 8.3.128 Field surveys for breeding birds were conducted within the breeding bird season in 2015, 2019 and 2024. All datasets are considered within the assessment of the baseline.
- 8.3.129 During 2015 breeding bird surveys a total of 62 species were recorded within the study area during the survey, including 47 breeding species (probable/ confirmed breeding). Of the 47 breeding species, 29 were of 'species of conservation importance'. The following species of conservation significance were recorded within the survey area.

⁵⁷ FPCR. North Hemel Hempstead – Appendix 13.6: Breeding Bird Survey Report. Report for Bloor Homes & Pigeon. 2025

Conservation classifications were assigned using Birds of Conservation Concern 4⁵⁸ and at the time of writing this has been superseded by Birds of Conservation Concern 5.

- Twelve 'Species of Principal Importance' listed under Section 41 of the NERC Act (i.e., bullfinch, dunnoek, herring gull, house sparrow, lapwing, linnet, reed bunting, skylark, song thrush, starling, yellow wagtail and yellowhammer), 11 of which were breeding within the study area (herring gull was not breeding);
- Five Hertfordshire LBAP species (i.e., bullfinch, linnet, reed bunting, skylark and song thrush), all five of which were breeding within the study area;
- Four species listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) (i.e., fieldfare, peregrine, red kite and redwing), one of which was breeding (red kite);
- Thirteen species on the 2015 BoCC red-list; and
- Fourteen species on the 2015 BoCC amber-list.

8.3.130 The Site was considered to be of County importance regarding species richness and support a locally important breeding assemblage, but did not qualify as a Local Wildlife Site (LWS) for breeding birds following the Selection Criteria for LWS In Hertfordshire.

8.3.131 The breeding bird assemblage recorded in 2019 surveys are summarised below (details of raptors are outlined within a separate section below). Conservation classifications have been updated in line with Birds of Conservation Concern 5.

Red listed BoCC:

- Seven breeding – skylark (27 territories), yellow wagtail (7 territories), mistle thrush (5 territories), starling (6 pairs), house sparrow (4 colonies), linnet (11 territories), and yellowhammer (16 territories).

Amber listed BoCC:

- Seven breeding – kestrel (1 pair), stock dove (5 pairs), tawny owl (3 pairs), dunnoek (42 territories), bullfinch (3 pairs) and reed bunting (5 territories) and song thrush (8 territories).

SPI:

- Ten breeding – skylark, yellow wagtail, dunnoek, song thrush, starling, house sparrow, linnet, bullfinch, yellowhammer and reed bunting.

LBAP (Hertfordshire):

- One breeding – song thrush.

8.3.132 The Site was considered to support a breeding bird assemblage of Local (District) importance. The number of different species recorded is a reflection of the size of the Site and the species recorded are those typical of arable

⁵⁸ Eaton, M. A., Aebischer, N. J., Brown, A. F., Hearn, R. D., Lock, L., Musgrove, A. J., Noble, D. G., Stroud, D. A., & Gregory, R. D. Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. 2015

farmland with hedgerows, in southern England. The Site qualified as a Local Wildlife Site (LWS) for breeding birds following the Selection Criteria for LWS In Hertfordshire under the Scrub and Farmland habitat definitions.⁵⁹.

8.3.133 Field surveys undertaken in 2024 recorded a total of 61 species including 29 notable species. This included two Wildlife and Countryside Act (WCA) Schedule 1 list species, 14 red-list Birds of Conservation Concern (BoCC) and 13 amber-list BoCC. Thirteen species were listed as Species of Principal Importance (SPI), one of which appears in the Local Biodiversity Action Plan (LBAP).

8.3.134 Of the notable species recorded the following species were recorded and breeding status assigned:

- **Three species were recorded as confirmed breeding species within the survey area: red list species** – linnet and two amber list species – dunnock and wren.
- **Ten notable species were recorded as probable breeding species within the survey area: five red-list species** – greenfinch, house sparrow, mistle thrush, skylark and yellowhammer and four amber list species – kestrel, song thrush, tawny owl and woodpigeon and one WCA Schedule 1 species – red kite.
- **Thirteen notable species were recorded as possible breeding species: seven red list species** – corn bunting, grey partridge, house martin, lapwing, starling, swift and yellow wagtail, five amber list species – mallard, meadow pipit, reed bunting, rook and stock dove and one WCA Schedule 1 species – peregrine.
- **Three notable species were recorded as non-breeding: one red list species** – herring gull and two amber list species – lesser black-backed gull and wheatear.

8.3.135 During the 2024-25 winter surveys the arable habitat and hedgerows on Site provided nesting and habitat with potential to support a range of notable species including ground nesting species such as grey partridge and skylark and species associated with hedgerows such as linnet, dunnock and yellowhammer. Crops were growing in stages providing greater opportunity for skylark and other ground nesting birds that prefer open nest sites with clear sightlines (Winspear & Davis, 2005) to produce later or multiple broods.

8.3.136 The pockets of woodland and areas of scrub within the Site varied in structure and species, with the potential to support notable breeding bird species including song thrush, tawny owl, reed bunting and greenfinch. The grassland field margins on the Site provided hunting habitat for raptors such as kestrel and foraging habitat for numerous other species.

8.3.137 The results of the 2024-25 winter surveys support previous findings. Using the nature conservation evaluation for notable bird species assemblages, the breeding bird assemblage recorded on the Site during 2024 surveys was considered to be of **Local importance** which is consistent with the previous assessment. Based on the importance assigned breeding birds are **scoped in** for further assessment. Note breeding raptors are considered separately.

⁵⁹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Breeding Bird Survey Report. 2019.

Raptors

- 8.3.138 The habitats present on Site are considered suitable to support a range of breeding raptors, this assessment is supported by desk study data and previous surveys and assessment of the Site. Assessment of barn owl and the assemblage of overwintering raptor are considered within respective separate sections of this Chapter.
- 8.3.139 Previous field survey and assessment of the Site to support breeding raptors was undertaken in 2019. These surveys identified a confirmed nesting attempt by hobby off-site but within the Zol and a confirmed nesting attempt by red kite within the Site boundary. Surveys for the North Hemel development north of Redbourn Road identified two potential red kite nest sites within the Zol in 2024. These were recorded as being unoccupied in 2025, but there is potential for them to be re-occupied in the future.
- 8.3.140 The desk study conducted as part of the Preliminary Ecological Assessment⁶⁰ identified 11 records of hobby and 307 records for red kite with 2km of the Site. The closest record for hobby was 1.12km south of the Site and related to one bird in nesting habitat.
- 8.3.141 In 2024 targeted raptor surveys were undertaken, the main target species were hobby and red kite, with secondary species comprising peregrine, barn owl and long-eared owl. A scoping survey was undertaken alongside the breeding bird surveys and identified suitable nesting habitat and features for all primary and secondary target species. Targeted raptor surveys were undertaken to supplement data collected within the standard suite of breeding bird surveys.
- 8.3.142 Targeted raptor surveys and the suite of breeding bird surveys within 2024 identified breeding behaviour of three notable raptors. Confirmed and potential nests for red kite were recorded, peregrine activity which was classified as possible breeding and kestrel activity recorded as probable breeding. Non-notable species recorded included buzzard.
- 8.3.143 A summary of current (2024) and historic field survey results (2017, 2019) per species is detailed below:
- **Red Kite** – Targeted surveys in 2024 confirmed one red kite nest and one potential red kite nest site, with significant activity also correlating with locations of a previously identified nest site. Within the suite of breeding bird surveys red kites were recorded on all survey visits, with behaviour including territorial aggression, carrying nest material and alarm calling. They were recorded as probable breeding species. Previous field surveys have recorded multiple nesting attempts by this species on the Site. A red kite nest with young was observed in an area of woodland in the west of EH South in 2016⁶¹ and again in 2019⁶². This species has a historic breeding presence on the Site. Following a scoping survey in 2015 subsequent red kite surveys were completed in the spring and summer of 2016, 2017 and 2018, during which breeding red kite were recorded within the Site. The 2019 red kite surveys confirmed one occupied nest within the Site which has been occupied since at least 2015 when surveys commenced and remaining in use until the 2019 surveys (see

⁶⁰ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Preliminary Ecological Appraisal. 2015.

⁶¹ Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Red Kite Survey Report. 2017.

⁶² Wardell Armstrong. East Hemel Hempstead, Hertfordshire. Red Kite Survey Report. 2019.

report Wardell Armstrong⁶²: located at PNS 14 in EH South). The 2019 survey recorded in addition to the confirmed red kite nest at PNS 14, another nesting attempt recorded for the first time during surveys at PNS 4, in EH North. This was recorded early in the season in March and following surveys confirmed it was unsuccessful and abandoned in April. Although these were not active in 2025 surveys, there is potential for them to be re-occupied in the future⁶³.

- **Peregrine** – Within the suite of breeding bird surveys, a single peregrine was observed calling on the fourth survey visit in May, with three other records of birds taking off or flying over in April and May survey visits. The pylons on Site provide potential nesting habitat and peregrine qualify as a possible breeding species. 2024 targeted survey did not record peregrine. Previous surveys in 2019 did not record peregrine on or adjacent to Site.
- **Hobby** – This species was not recorded within any ornithology field surveys within 2024 and classified as non-breeding during that survey period. Previous field surveys in 2019 recorded a confirmed nesting attempt off-site and within the zone of influence south of EH East.
- **Long-eared owl** – This species was not recorded within any ornithology field surveys within 2024 and classified as non-breeding during that survey period. Previous survey in 2019 did not record breeding activity by long-eared owl. Foraging activity was recorded in EH South, although no conclusive evidence of breeding long-eared owl was identified in 2019, the potential for breeding within the Site remains due to the highly secretive nature of this species.
- **Other raptors** – Kestrel were recorded on four of the six breeding bird survey visits and indicative territory analysis suggests a single territory. Kestrel was assessed as a probable breeding species in 2024. Previous field survey in 2019 recorded one occupied nest for tawny owl (PNS 5) and one occupied nest for sparrowhawk (PNS 13).
- **Non-notable raptors** - Targeted survey in 2024 recorded a potential buzzard nest at VP9. Previous field survey in 2019 recorded four occupied nests for buzzard (PNS 5, 7, 9 and 15).

8.3.144 Based on the conservation significance of the raptor species recorded and the assemblage of breeding raptors record on Site and in adjacent functionally linked habitat within the zone of influence, breeding raptor are considered to be of **Local importance** and are **scoped in** for further assessment.

Wintering Birds

8.3.145 Winter bird surveys have been undertaken at the Site over the winter periods 2014-2015 and 2016-2017⁶⁴, 2018-19⁶⁵ and 2024-25. Following surveys undertaken by Wardell Armstrong and Temple, a small extension of the red line boundary was added to the north of Redbourn Road in the north of the Site. Surveys of this area were

⁶³ FPCR. North Hemel Hempstead – Appendix 13.6: Breeding Bird Survey Report. Report for Bloor Homes & Pigeon. 2025

⁶⁴ Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2017

⁶⁵ Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2019.

undertaken for the proposed North Hemel development across the winter seasons of 2023/24 and 2024/25.⁶⁶ The results of these surveys did not introduce any additional constraints relating to wintering birds.

8.3.146 The key findings of the wintering bird surveys undertaken over the survey period 2014-15 and 2016-17.⁶⁷ are summarised below. A total of 52 species were recorded within the survey area over these two winter periods including the following species of conservation concern (note that species may be assigned multiple conservation designations or protections):

Three species listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

- redwing, fieldfare and red kite;

Ten Species of Principal Importance listed under Section 41 of The NERC Act

- bullfinch; dunnock; herring gull; house sparrow; lapwing; reed bunting; skylark; song thrush; starling and yellowhammer;

Five Hertfordshire region LBAP

- bullfinch; long-eared owl; reed bunting; skylark and song thrush;

Nine Red-listed BoCC species

- fieldfare; herring gull; house sparrow; lapwing; mistle thrush; skylark; starling; woodcock and yellowhammer;

Twelve Amber-listed BoCC species

- black-headed gull; bullfinch; common gull; dunnock; great black-backed gull; kestrel; lesser black-backed gull; mallard; meadow pipit; reed bunting, song thrush; grey wagtail; redwing and stock dove.

8.3.147 Following surveys over 2016-17 the Site was considered to be of **Local (District) Importance** in relation to species richness for over-wintering farmland and woodland bird species and did not qualify as a Local Wildlife Site, for wintering birds, following the selection criteria for Local Wildlife Sites in Hertfordshire.

8.3.148 During the 2016-17 winter period, the areas of highest ornithological value on the Site were the stubble fields with associated field margins, species-rich hedgerows, woodland blocks and mature trees that support a diverse range of overwintering bird species.

8.3.149 The key findings of the wintering bird surveys undertaken in 2019.⁶⁸ are summarised below. A total of 54 species were recorded within the survey area including the following species of conservation concern:

Five species listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

- Red kite, peregrine falcon, fieldfare, redwing and brambling.

Nine Species of Principal Importance listed under Section 41 of The NERC Act

⁶⁶ FPCR. North Hemel Hempstead – Appendix 13.7: Wintering Bird Survey Report. Report for Bloor Homes & Pigeon. 2025.

⁶⁷ Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2017

⁶⁸ Wardell Armstrong. Wintering Bird Survey Report. Report for The Crown Estate. 2019.

- Skylark, dunnock, song thrush, starling, house sparrow, linnet, bullfinch, yellowhammer and reed bunting.

One Hertfordshire region LBAP

- Song thrush.

Ten species on the BoCC Red-List

- Woodcock, skylark, grey wagtail, fieldfare, redwing, mistle thrush, starling, house sparrow, linnet, and yellowhammer.

Twelve species on the BoCC Amber-List

- Mallard, kestrel, black-headed gull, common gull, lesser black-backed gull, stock dove, song thrush, tawny owl, meadow pipit, dunnock, bullfinch and reed bunting.

8.3.150 In the 2018-19 winter period, the areas of highest ornithological value on the Site were the open arable fields and horse paddocks in conjunction with associated field margins, species-rich hedgerows, woodland blocks and mature trees that supported a range of common overwintering bird species.

8.3.151 The Site was considered to support a wintering bird assemblage of **Local (District) Importance**. The number of different species recorded is a reflection of the size of the survey area and the species recorded were those typical of arable farmland with hedgerows, in southern England. The survey area did not qualify as a Local Wildlife Site, for wintering birds following the selection criteria for Local Wildlife Sites in Hertfordshire.

8.3.152 The 2023/24 and 2024/25 surveys by FPCR found that the North Hemel site, which includes a small extension to the Development Site red line boundary to the north of Redbourn Road, supported an assemblage of wintering birds typical of the habitats present, with large flocks of winter thrushes, starlings and woodpigeon, low numbers of raptors and flocks of skylark using the habitat for foraging.

8.3.153 A total of 51 species were recorded by Temple during the 2024-25 surveys, including 28 notable species. One Schedule 1 breeding bird species was recorded, ten species were BoCC Red-list and 17 species were BoCC Amber list. One Amber List species, song thrush, is also a Hertfordshire BAP species.

8.3.154 A summary of notable species recordings is detailed below (note that species may be assigned multiple conservation designations or protections):

Three species listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

- Redwing, red kite and fieldfare.

Nine Species of Principal Importance listed under Section 41 of The NERC Act

- Dunnock, reed bunting, song thrush, herring gull, house sparrow, linnet, skylark, ng and yellowhammer.

One Hertfordshire region LBAP

- Song thrush.

Ten species on the BoCC Red-List

- Fieldfare, greenfinch, herring gull, house sparrow, linnet, mistle thrush, skylark, starling, woodcock and yellowhammer.

Seventeen species on the BoCC Amber-List

- Black-headed gull, common gull, dunnock, green sandpiper, kestrel, mallard, oystercatcher, redshank, redwing, reed bunting, rook, song thrush, sparrowhawk, stock dove, tawny owl, wood pigeon and wren.

8.3.155 Using the nature conservation evaluation for notable bird species assemblages (CIEEM, 2018), the wintering bird assemblage recorded within the Site during 2023 and 2024 surveys are considered to be of **Local importance**, due to the presence of 28 notable bird species. This evaluation is consistent with previous assessments of the wintering bird assemblage on the Site. Based on the importance assigned wintering birds are **scoped in** for further assessment

Reptiles

8.3.156 The data search provided a total of eight records for reptiles, none within the last ten years. The most recent is from 2007, a record of slow worm located 330m from the Site.

8.3.157 The Site contained habitats with the potential to support locally common/ widespread reptile species. The arable fields on the Site offered limited suitable foraging habitat for reptiles; however, the field margins, hedgerows, scrub and woodland edge within and adjacent to the Site were of greater suitability. No reptiles were recorded throughout the seven survey visits.

8.3.158 Given the reptile surveys did not identify any reptiles, they are **scoped out** of further assessment; however, due to the Site's connectivity to suitable reptile habitat within the wider environment, in the absence of mitigation, there is potential for the killing or injury of individual reptiles during the development works. Therefore, consideration for these species has been given in Section 8.4.2 to 8.4.21 to be sure of legal compliance.

Invertebrates

8.3.159 The desk study from HERC returned records for stag beetle, white admiral, cinnabar moth, shaded broad-bar moth, small blue and small heath butterflies, all of which are Species of Principal Importance. Small heath butterflies were observed adjacent to the west of the Site in 2019. There was a single record for purple emperor, a Hertfordshire BAP species, 690m west from Site in 2014. Stag beetle are a qualifying feature of the Chilterns Beechwoods Special Area of Conservation (SAC) located 10km to the north-west.

8.3.160 The desk study records provided by Butterfly Conservation for Westwick Row Wood LWS, which is located within the Site, included 22 species. Of these, the small heath, a Butterfly Conservation high priority species, is listed on the GB Red List (2022) as vulnerable and is a Species of Principal Importance. Another species of note recorded at Westwick Row Wood LWS was the small tortoiseshell, a Butterfly Conservation "low priority (but concern over recent decades)" species, which is listed on the GB Red List (2022) as Least Concern.

8.3.161 Information sourced from the Friends of The Nickey Line website (<https://www.nickeyline.org/>) suggests that butterfly species commonly seen at the Nickey Way Dismantled Railway LWS, which is partly located within the

Site, mostly include those with Butterfly Conservation low priority and GB Red List (2022) status least concern. These include meadow brown, orange-tip, peacock, brimstone, small white, holly blue, green-veined white, speckled wood, large skipper, ringlet, marbled white, painted lady, common blue and small tortoiseshell. The wall butterfly, a Butterfly Conservation high priority species, listed on the GB Red List (2022) as endangered and an SPI has not been recorded in recent years.

8.3.162 The majority of the Site comprises arable land, which is of limited value for invertebrates. However, small areas of other neutral grassland, scrub, woodland (together accounting for approximately 7.5% of the total site area), as well as features such as log piles and deadwood, mostly associated with site boundary areas, which provide suitable invertebrate habitats to support notable terrestrial invertebrates, including Species of Principal Importance such as stag beetle and small heath butterfly, which are known to occur in the local area. Ragwort was recorded on Site which is the main food source of the cinnabar moth caterpillar. Higher quality habitats of larger extent are present in the wider environment.

8.3.163 While several of the species recorded have Species of Principal Importance (SPI) status, the majority are common and typical of arable habitats prevalent in the wider local landscape. Due to the limited extent of suitable habitat on Site, and the predominance of widespread species in the records, the invertebrate assemblage associated with the Site is considered to be of **Site importance** and therefore **scoped out** of further assessment.

Other Species

8.3.164 Based on the findings of the desk study and of the habitat survey, brown hare, hedgehog, polecat, harvest mice and common toad, which are all SPIs, have the potential to be present on the Site.

8.3.165 During the habitat survey a brown hare was observed running from an off-site arable field towards a hedgerow, which was connected to other arable fields and hedgerows within the Site. Records from the desk study also confirmed the presence of brown hare on the Site and from Gorhambury Estate to the east. Arable fields surrounded by field margins with tall grass, woodlands, young plantations, hedgerows and scrub provide suitable habitat for brown hares. Brown hare is a Species of Principal Importance; however, given the abundance of suitable habitats in the wider landscape, this species is considered to be of **Site importance** and therefore **scoped out** of further assessment.

8.3.166 The desk study provided 74 records for hedgehog within the last ten years, including records on Site at Hogg End Lane in 2015, and in Leverstock Green 20m west of the Site. The Site contains suitable habitat for hedgehog, such as areas of scrub, and semi-natural and plantation woodland including areas of leaf litter and log piles. There are areas of suitable foraging habitat, as well as breeding and hibernating opportunities, which are connected to other areas of suitable habitat. Hedgehog is a Species of Principal Importance; however, given their widespread occurrence in the surrounding area, as demonstrated by the abundance of records, and availability of suitable habitats in the wider landscape, this species is considered to be of **Site importance** and therefore **scoped out** of further assessment.

8.3.167 The Site provides a range of suitable foraging and breeding habitats for polecats, including tall grasses along road verges, cereal crops, hedgerows and woodland edges. There were two records for polecat returned in the data search, including one 10m from Site in 2019 along Hemel Hempstead Road which runs adjacent to the south Site boundary. The Hertfordshire Atlas of mammals, amphibians and reptiles 2015-24 suggests polecat is locally distributed in Hertfordshire. Polecat is a Species of Principal Importance and is classified on the Red List for Britain's Mammals as 'Least Concern' in England. Given the species restricted distribution and only two recent records being returned by the desk study, it is likely the species is present however not in large numbers or representing a significant population. While the Site provides suitable habitat (hedgerows, woodland edges, road verges, cereal crops), these habitats are also present in the surrounding landscape. Therefore, this species is considered to be of **Site importance** and **scoped out** of further assessment.

8.3.168 The Site provides a range of suitable foraging and breeding habitats for harvest mice, including tall grasses along road verges, cereal crops, hedgerows and woodland edges. The data search returned only one historic record with limited connectivity to site. The Hertfordshire Atlas of mammals, amphibians and reptiles 2015-24 shows a localised distribution in Hertfordshire with presence confirmed only in 10 tetrads. Given the lack of recent records and the species' localised distribution in Hertfordshire, harvest mouse might be present in low numbers on Site. Therefore, this species is considered to be of **Site importance** and **scoped out** of further assessment.

8.3.169 The Site provides both aquatic and terrestrial habitat for common toads for both breeding and hibernating, including ponds, woodland, hedgerows, and log piles. There were ten records for common toads returned in the data search, with the most recent being from 2002, 760m west of the Site, with limited connectivity. The Hertfordshire Atlas of mammals, amphibians and reptiles 2015-24 shows that common toad is moderately widespread but with a scattered distribution across the county, occurring in 97 tetrads out of 504. Although common toad is a Species of Principal Importance and the Site provides suitable aquatic and terrestrial habitat for this species, there are numerous ponds within 500 m of the Site and extensive suitable terrestrial habitat in the wider surroundings. Therefore, any population is likely to be of **Site importance** and **scoped out** of further assessment.

Ecological Receptor and Scoping Summary

8.3.170 A summary of the ecological receptors identified in the above baseline analysis is detailed in **Table 8.8** below. Impacts to receptors classified as Local Importance or above only are considered further within this assessment.

Table 8.8: Summary of Ecological Importance

Ecological Feature	Geographic Scale of Importance	Scoped in/ out of further assessment
Designated Sites – Statutory Designated Sites		
Chilterns Beechwoods SAC	International	In
Roughdown Common SSSI	National	In

Ecological Feature	Geographic Scale of Importance	Scoped in/ out of further assessment
Bricket Wood Common SSSI	National	In
Ashridge Commons and Woods SSSI	National	In
Designated Sites – Non-Statutory Designated Sites		
Westwick Row Wood LWS	Local	In
Nicky Way Dismantled Railway LWS	Local	In
Disused Railway Line, Hemel Hempstead	Local	In
Blackwater Wood LWS	Local	In
Westwick Hall LWS	Local	In
Potters Crouch Plantation	Local	In
Holy Trinity Church, Leverstock Green LWS	Local	In
Kettlewell's Farm Area LWS	Local	In
High Wood (Hemel Hempstead) LWS	Local	In
Prae Wood LWS	Local	In
Woodhall Wood LWS	Local	In
Appspond Wood LWS	Local	In
Windmillhill Wood and adjoining woodland LWS	Local	In
Great Revel End Farm LWS	Local	In
Widmore Wood LWS	Local	In
Birch Wood (near Potters Crouch) LWS	Local	In
Redbourn Common LWS	Local	In
Bury Wood (near Redbourn) LWS	Local	In
Maylands Wood LWS	Local	In
Gorhambury Cottage Area LWS	Local	In
Gorhambury Icehouse LWS	Local	In
Long Deans Wood LWS	Local	In
Wellfield Spring LWS	Local	In

Ecological Feature	Geographic Scale of Importance	Scoped in/ out of further assessment
Temple Cottage Area, Gorhambury LWS	Local	In
Ver Valley by Chequer Lane LWS	Local	In
Rant Meadow Wood/Bennets End Pit LWS	Local	In
Featherbed Lane Copse by Serge Hill LWS	Local	In
Potterscrouch Section LWS	Local	In
Long Spring (Potters Crouch) LWS	Local	In
Serge Hill Meadow LWS	Local	In
Redbournbury Meadows LWS	Local	In
Hay Wood (Holtmere) LWS	Local	In
Scrubs Wood LWS	Local	In
New Wood (W. of Redbourn) LWS	Local	In
Park Wood (near Chiswell Green) LWS	Local	In
Piecorner & Hanging Wood LWS	Local	In
Habitats		
Ancient Woodland	Local	In
Habitats of Principal Importance – Floodplain grazing marsh and Woodpasture and parkland	County	In
Habitats of Principal Importance – Rivers Gade and Bulbourne chalk streams	Local	Out
Other Habitats of Principal Importance	Local	In
w1g – Other broadleaved woodland	Site	Out
w1h – Other woodland; mixed	Site	Out
w1h6 – Other woodland; mixed; mainly conifer	Site	Out
w1f – Lowland mixed deciduous woodland	Local	In
c1c7 – Other cereal crops	Site	Out
c1c7 – Other cereal crops, 81 - Ruderal or ephemeral	Site	Out
g4 – Modified grassland	Site	Out

Ecological Feature	Geographic Scale of Importance	Scoped in/ out of further assessment
g4 – Modified grassland, 16 – Tall forbs	Site	Out
g3c – Other neutral grassland	Site	Out
h3d – Bramble scrub	Site	Out
h3f – Hawthorn scrub	Site	Out
h3h – Mixed scrub	Site	Out
h3g – Rhododendron scrub	Site	Out
r1f – Temporary waterbodies 848 Sustainable drainage system	Site	Out
u1 – Built up areas and gardens 828 vegetated garden	Site	Out
u1 – Built up areas and gardens, 847 introduced shrub	Site	Out
u1b – Developed land – sealed surface, u1b5 - Building and u1b6 - Other developed land	Negligible	Out
u1c – Artificial unvegetated – unsealed surface	Negligible	Out
u1f – Sparsely vegetated urban land, 510 bare ground	Negligible	Out
h2a - Native hedgerow	Local	In
h2a5- Species-rich native hedgerow	Local	In
h2a5 - Species-rich native hedgerow, 11 - Hedgerow with trees	Local	In
h2a6 - Other native hedgerow, 11 - Hedgerow with trees	Local	In
w1h – Other woodland; mixed, 16 – Ecologically valuable line of trees	Site	Out
r2b – Other river/stream, 50 – Ditch	Site	Out
32 - Scattered trees	Site	Out
Fauna		
Bats – known summer roosts in buildings	Site	Out (legal only)
Bats – hibernation roosts in buildings	Local	In
Bats – Potential summer & hibernation roosts in trees	District	In
Bats – foraging and commuting	Regional	In

Ecological Feature	Geographic Scale of Importance	Scoped in/ out of further assessment
Great crested newt	Site	Out (legal only)
Hazel Dormouse	None*	Out
Badger	Local	In
Barn owl	Local	In
Breeding birds	Local	In
Raptors	Local	In
Wintering birds	Local	In
Reptiles	Site	Out (legal only)
Invertebrates	Site	Out
Other SPI species (brown hare, hedgehog, polecat, harvest mouse and common toad)	Site	Out

* hazel dormouse is considered likely absent from Site and therefore not assigned any level of geographic importance

Future Baseline

- 8.3.171 If the Development did not proceed as planned, some changes in baseline conditions within the Site may occur over time but are considered likely to be limited. The Site would likely continue to be managed as agricultural land.
- 8.3.172 Under this land use, a 'do nothing' scenario is not considered to result in significant changes but there may be change to the presence of protected species dependant on various factors including surrounding land use, weather patterns and broader climate trends. Future baseline conditions are likely to be increasingly affected by the combined impacts of more frequent and severe droughts and altered precipitation patterns driven by climate change. These changes are expected to reduce soil moisture and water availability, particularly during the summer months, placing additional stress on terrestrial and freshwater habitats. In particular, smaller waterbodies such as ponds may be at risk of seasonal drying or permanent loss, especially where they are shallow, lack shading, or are disconnected from reliable water sources.
- 8.3.173 Over time, further decay of buildings or trees on or adjacent to Site could occur, potentially increasing the availability of roosting opportunities for bats. However, a 'do nothing' scenario is not considered unlikely as the site has been identified as a strategic site for housing by SADC and DBC.

8.4 Likely Effects of the Development and their Significance

The Works

8.4.1 The assessment has considered activities associated with the Works phase (enabling and construction) and whether these have the potential to result in significant effects on biodiversity, considering the key elements of the design and construction programme. For the purpose of this Chapter, ecological features of local importance or higher are assessed as being 'important' *sensu* CIEEM 2018.⁶⁹ and are carried forward into the assessment.

Embedded Mitigation Measures

8.4.2 The identification of impacts on biodiversity during the Works phase takes account of primary and tertiary mitigation (those measures regarded as 'embedded' in the design of the Development) and the following assessment describes the potential effect for each important ecological feature assuming all embedded design measures are in place, but in the absence of additional, or secondary, mitigation (i.e., mitigation which would not be adopted regardless of the EIA process).⁷⁰

8.4.3 The Works phase will be completed in accordance with a Construction Environmental Management Plan (CEMP). An outline CEMP is submitted as part of the planning application (**ES Volume 3, Appendix 6.1**) and will be updated where necessary prior to the start of each phase of Works commencing and which will detail all mitigation measures to be undertaken during construction. The Development shall comply with all legal requirements as identified in the CEMP.

8.4.4 Relevant industry guidance includes Pollution Prevention Guidelines (PPGs) which contain a mix of regulatory requirements and good practice advice. They have been withdrawn by the Environment Agency but are still considered good practice advice to avoid pollution of (off-site) watercourses. Other sources of best construction practice and environmental management include CIRIA guidance.⁷¹ and the various Defra/ Environment Agency guidelines.⁷² Mechanisms to avoid pollution will be implemented to make sure all forms of pollution will be prevented/ contained within the construction sites including airborne particles, dust and groundwater contamination wherever possible.

8.4.5 Any construction lighting at night will be controlled as detailed in the CEMP such that light spill onto retained habitats of value to biodiversity, including woodland, hedgerows, trees, particularly those with suitability as, or known bat roosts. Mitigation measures will be in-line with those given by the Bat Conservation Trust and Institution of Lighting Professionals.⁷³ and include restriction of lighting levels at night to the minimum required for safe

⁶⁹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester.

⁷⁰ IEMA (2024) Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction

⁷¹ Connolly, S. & Charles, P. (2015). Environmental good practice on site guide. CIRIA, London.

⁷² Defra/Environment Agency. Guidance included via various links on the gov. website. <https://www.gov.uk/government>

⁷³ Institution of Lighting Professionals (2023) Bats and Artificial Lighting in the UK. Guidance Note 08/23. Institution of Lighting Professionals and Bat Conservation Trust <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting>

working, use of directional lighting, the use of warm tone LED lighting and the locations of temporary site compounds and lay down areas to be used at night away from areas of sensitive habitat.

- 8.4.6 While potential impacts on great crested newts and reptiles are not considered to be significant and have been scoped out, in order to comply with legislation, the CEMP will include precautionary measures to protect them in case they are present to prevent killing or injury – see below.
- 8.4.7 Where works would otherwise result in an offence under the Conservation of Habitats and Species Regulations 2017 (as amended) or the Protection of Badgers Act 1992, mitigation licences will be required from Natural England to derogate from the relevant legislation and make sure the long-term favourable conservation status of the species. This will set out the requirements for mitigation and compensation, working practices and timings of operations in line with accepted guidelines, and any necessary post-development monitoring to make sure the mitigation provided is effective and remedial measures can be taken to address this if not. This will apply to badgers and bats. Measures required as part of the mitigation licences, which would be granted following planning consent, but prior to works commencing, and required in order to be sure of compliance with the nature conservation legislation are considered embedded mitigation.

Legal compliance – protected species

Great crested newt

- 8.4.8 The presence of GCN on site is considered unlikely, and if any individuals/small numbers are present they would be of at most importance at the Site level (see above). Therefore, they are not taken forward for detailed assessment of effects. However, they are subject to legal protections under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats & Species Regulations 2017 (as amended) and precautionary measures should be taken where appropriate to make sure no offence is committed.
- 8.4.9 This should include completion of up-to-date surveys where possible/appropriate, and where necessary, precautionary working methods to be included within the CEMP to avoid/minimise the risk of killing or injury through precautionary working practices. Owing to the very low risk of presence on site, a proportionate and pragmatic approach should be adopted.
- 8.4.10 Dry ponds will be checked and removed as per the above. If holding water at the time, they will be subject to an update eDNA survey and, where it remains negative, will be drained down under the supervision of a suitably experienced ecologist. Screens with a fine (<1.5mm) mesh will be fitted to pumps to prevent any wildlife from being drawn through. If possible, a narrow trench will be dug from the pond from which the water will be drawn off, rather than from the pond directly, with a fine mesh screen across the mouth of the trench, or water will be trenched away by gravity to a nearby ditch. The attending ecologist will search through the water as it becomes shallower and remove fish and other wildlife to pre-filled buckets for transfer to retained ponds. In the highly unlikely event that great crested newts are found during this operation these will be left in situ and drainage will stop immediately. Water will be pumped back into the pond and a licence will be sought to allow works to legally

proceed again. Should update eDNA surveys suggest presence, then a licence will be obtained prior to any pond works commencing.

- 8.4.11 Should evidence of presence of great crested newt be found or suspected at any time during works, potentially damaging operations will cease immediately, and a District Level Licence (DLL) will be obtained. The obligations under this scheme will need to be met before works could proceed further such that significant effects on great crested newts will not occur.
- 8.4.12 The CEMP will also set out how materials and spoil will be stockpiled to prevent the creation of favourable habitat to newts. Piles of soil and materials will be stored on hardstanding or raised off the ground to prevent newts accessing it for shelter. As part of standard measures to prevent dust pollution and runoff, stockpiled materials may also be covered.
- 8.4.13 The locations of proposed habitat connectivity across the STC will include appropriate consideration of the safe passage of amphibians, including GCN, where necessary/appropriate in view of any updated survey findings/licensing requirements and the potential future value of the site for amphibians following the creation of open water and terrestrial habitats on the Site. This will be further considered at the detailed design stage and included within the Ecological Mitigation, Enhancement and Management Strategy (EMEMS).

Bats

- 8.4.14 The CEMP will limit working hours as outlined below and will avoid illumination/light spill on trees and woodland. This will avoid disturbance effects from artificial lighting upon bat during construction during the active flight season.
- *Monday to Friday – 7:30am to 6:00pm;*
 - *Saturdays – 8:00am to 1:00pm; and*
 - *No noisy works allowed on Sundays and Bank and Public Holidays.*
 - *Start-up and close-down periods of up to an hour before and after core working hours (6:30am to 7:00pm Monday – Friday / 7:00am to 2:00pm Saturday) will be used for activities such as arrival of workforce and staff on-Site; deliveries and unloading; maintenance and checking of plant and machinery; general refuelling; site inspections, and safety checks prior to commencing work; site meetings; and general site clean-up and departure.*

Reptiles

- 8.4.15 Reptiles have not been recorded on Site during surveys but habitats with the potential to support them are present within the Site boundaries. As such, it cannot be discounted that very low numbers of common and widespread reptiles are present. Reptiles such as grass snake, adder, slow worm and common lizard are protected from killing and injury under the Wildlife & Countryside Act 1981 (as amended).
- 8.4.16 If present, the killing or injury of reptiles could occur during the clearance of suitable terrestrial vegetation such as scrub, grassland, hedgerow bases and woodland, including plantation woodland. It may also occur during the

dismantling or removal of rubble and deadwood piles, and during the excavation of areas of ground with mammal burrows or deep fissures in which reptiles may be sheltering or hibernating.

- 8.4.17 The inclusion of precautionary working methods within the CEMP as proposed for great crested newts above, will also serve to make sure that, in the unlikely event that any reptiles are present on Site, they will not be killed or injured during habitat clearance as part of the enabling and construction phase.

Nesting birds

- 8.4.18 All wild birds and their active nests (including those in the process of being built) are legally protected under the Wildlife & Countryside Act 1981 (as amended). A full assessment of the significance of effects of the Development on the status of the breeding bird assemblage at the Site has been undertaken below. This takes account of measures within the CEMP to make sure that individual birds are not killed or injured and their nests not damaged or destroyed. Such measures include clearance of suitable habitat outside of the main bird breeding season (typically March to August inclusive.⁷⁴) and pre-works checks or surveys prior to clearance during other times, as well as the establishment of suitable buffer zones around any nest found. Where vegetation clearance is not possible outside the main bird breeding season, works will be supervised by a competent ecologist following the pre-works check.

Embedded green network

- 8.4.19 The Development has embedded within it an extensive green network which incorporates existing habitats of biodiversity value such as hedgerows, woodland (including Westwick Row Wood and an area of plantation woodland in EH South, and an area of HPI deciduous woodland in EH North) and trees wherever possible. Up to 76.8 ha of Suitable Alternative Natural Greenspace (SANG) will be provided on the Site. A large SANG provision in EH North, in the form of the Country Park, has been designed to follow the existing landscape character and topography and will enhance greatly the biodiversity value of the Site from its largely arable baseline. In EH South, the Valley Park will provide green space through the dished valley with floodable meadows, wetlands, and SuDS features proposed alongside other habitat creation for wildlife. With the interconnecting links formed by green corridors and landscape buffers, over 45% of the Site west of the M1 motorway is to be open space.
- 8.4.20 Together, this green network will provide an increase in area and quality of foraging and refuge for many species known to be present in and around the Site, as well as wildlife corridors enabling connectivity across the Site and with off-site habitats. Landscaping within the Development should follow best practice guidelines and incorporate native species of local provenance and fruit, nut and seed-bearing species with consideration given to using translocated soils and/or species removed from Site.

⁷⁴ Newton, J., Nicholson, B., Saunders, R., Willets, R. & Venables, R. (2011) Working with wildlife: guidance for the construction industry (2nd Ed.). CIRIA, London.

Effects scoped into the assessment

8.4.21 As set out in the EIA Scoping Report and subsequent consultation responses the potential for the following likely significant effects to arise during Site preparation, demolition and construction works are considered:

- Negative effects on designated sites, notably the Chilterns Beechwoods SAC and Ashridge Commons and Woods SSSI, resulting from the pollution of habitats caused by accidental contamination including impacts due to likely changes in air quality.
- Loss, degradation and/or fragmentation of habitats on Site or within the Zone of Influence (ZoI) of the Works, including woodland, trees and hedgerows through damage to soils, roots and vegetation and changes to drainage and air quality.
- Disturbance to species on Site through construction activities such as noise, light, vibration and the movement of people and machinery, including potential disturbance to bat roosts, Schedule 1 list nesting birds, badger setts and badger.
- Harm to species on-Site through construction activities, including potential damage and destruction of habitat, bat roosts, active bird nests and Schedule 1 list nesting birds, wintering bird habitat, bat foraging areas and commuting routes, and badger setts.
- Potential release of contaminants, dust and emissions that could affect habitats and species.

Traffic modelling and air quality

8.4.22 Traffic modelling has been undertaken to assist with the development of the evidence base for the draft St Albans District Council (SADC) and Dacorum Borough Council (DBC) Local Plans, as well as supporting the planning submission for the Proposed Development at East Hemel. The model includes main links such as the M1 motorway, A414, A4147 Hemel Hempstead Road and Redbourn Road plus lower classified roads in the immediate vicinity of the Site such as Green Lane, Three Cherry Trees Lane and Cherry Tree Lane.

8.4.23 The extent of the model, which forms the basis of the Transport Assessment for the Development (**ES Volume 3, Appendix 10.1**), has been agreed with SACDC, DBC, Hertfordshire County Council (HCC) and National Highways parties as suitable for the East Hemel Development. The construction phase is anticipated to commence in 2028, with first occupation in 2030. Traffic data, representative of the construction phase has been provided for the year 2030, which corresponds to the year in which construction traffic is at its highest, in combination with the elements of the Development which are anticipated to be operational by 2030.

8.4.24 The traffic modelling established whether estimated traffic levels on the road network around the Site during the construction phase are predicted to fall above the critical thresholds of ≥ 1000 vehicles (LDV) or 200 Heavy Duty

Vehicle (HDV) Average Annual Daily Traffic (AADT).^{75,76} (the Affected Road Network or ARN) (see **ES Volume 2: Chapter 10 – Transport**).

- 8.4.25 IAQM guidance (IAQM, 2017) states that it is unlikely that any significant adverse impacts on local air quality would be caused by construction traffic and in the vast majority of cases, quantitative assessment is not needed. As set out in the CEMP, construction vehicles will primarily access the Site from the A414 and M1 motorway to the east. Some construction traffic from local businesses may approach Site via Breakspear Way and other local traffic networks but only along pre-approved, designated routes.
- 8.4.26 The traffic modelling has shown that there are considerably fewer affected links during the construction phase than during the operational development and that the volume of construction traffic is far less than at the same links during the operational phase.
- 8.4.27 Only one ecological receptor (HPI woodland around Marchmont Pond) falls within the construction ARN and this is scoped in for further assessment. Air quality effects on all other ecological receptors are scoped out as predicted levels of traffic movements in proximity to these sites or habitats do not exceed the relevant thresholds.

Statutory Designated Sites

Chilterns Beechwoods SAC

- 8.4.28 Information required by the competent authority in respect of Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) is presented in the shadow Habitats Regulations Assessment (HRA) (**ES Volume 3, Appendix 8.13**).
- 8.4.29 There will be no direct impacts on the SAC during the construction phase of the Works, with no land-take or loss of habitats within or functionally linked to, the SAC. Given the distance of the Site from the SAC, neither will there be effects from disturbance or air quality effects through dust deposition or surface/ groundwater contamination from construction activity on the Site.
- 8.4.30 Construction vehicles will primarily access the Site from the A414 and M1 motorway to the east. Some construction traffic from local businesses may approach the Site via Breakspear Way and other local traffic networks but only along pre-approved, designated routes. Traffic modelling using a cumulative scenario, using 2030 as the year in which peak construction will occur, whilst at the same time allowing for a degree of overlap with first occupation of c. 250 dwellings (operational use) has demonstrated that the SAC lies beyond the extent of the construction ARN and the CEMP includes for the avoidance of use of the B4506 past the nearest part of the SAC at Ashridge Commons and Woods SSSI. The links on which AADT does exceed IAQM 2020 thresholds during the Works are along the A414 Breakspear Way (East) and Green Lane (south of Boundary Way) which form some of the primary construction routes to Site, and these do not pass close to the SAC. Furthermore, during the operational phase when the volume

⁷⁵ Natural England (2018) Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations.

⁷⁶ IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites.

of traffic is expected to be much greater, the AADT threshold at modelled links along routes towards the SAC are not exceeded, even when those data at different link locations are combined to account for the possibility that more than one route may be used.

- 8.4.31 In addition, embedded within the CEMP is the production of a staff travel plan for each development parcel or plot to encourage staff to use sustainable means of transport (i.e., public transport). No effects from changes to air quality as a result of construction traffic road emissions are therefore anticipated from the Development in isolation or in-combination with those committed developments within the model.
- 8.4.32 Construction phase effects on the SAC in relation to direct habitat loss and other impacts such as dust deposition, water quality and air quality are **not considered significant**.

Roughdown Common SSSI

- 8.4.33 This SSSI is a former chalk quarry notified for its CG2 lowland calcareous grassland (of the type *Festuca ovina* – *Avenula pratensis*) which supports a rich assemblage of plant species with bryophytes integral for this habitat. The Jersey Mocha moth has also been recorded on the site and the sealed-off mine supports a small colony of hibernating brown long-eared bats⁷⁷, although neither are notified features of the site. The SSSI is, as of 2019 (the date it was last assessed) in favourable condition⁷⁸.
- 8.4.34 The SSSI is located 4.2km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the mainline railway, and the River Gade corridor. At this distance, there is no realistic scope for disturbance of protected species from construction activities, for example, the brown long-eared bats at roost at the site. There is no direct hydrological connectivity between the Site and the SSSI which could otherwise lead to waterborne pollution, and it is beyond the distance that any potential effects from dust deposition generated as a result of construction activities on site would be felt.
- 8.4.35 The position of the SSSI adjacent to the A41, however, which could be used by construction site traffic accessing the Site via the A414 to the west, may mean that levels of pollutants, namely NO_x, NH₃, SO₂ and N deposition, increase temporarily during the construction phase, particularly if routes that pass close to the Chilterns Beechwood SAC are actively avoided as part of a travel plan or CEMP. Calcareous grassland habitats such as that present within the SSSI are sensitive to such pollutants and acidity, and typical effects can include a reduction in species richness and/ or species diversity/ changes species composition, the loss of rare or endangered species and calcicolous mosses and lichens, and changes to soil chemistry.
- 8.4.36 Construction traffic will, however, primarily access the Site via the A414 and M1 to the east, rather than from the west and through Hemel Hempstead, although some construction traffic from local businesses may approach via Breakspear Way and pre-approved, designated local traffic networks. It is not anticipated, however, that the A414 to the west will form a major route to Site.

⁷⁷ [Roughdown-Common-Management-Plan.pdf](#)

⁷⁸ <https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1001729&SiteName=Roughdown%20Common%20SSSI>

8.4.37 The traffic modelling has shown that there are considerably fewer affected links during the Works than during the Completed and Operational Development and that the volume of construction traffic is far less than at the same links during the operational phase. The routes close to the SSSI that could theoretically be used to access the Site do not form part of the construction ARN and during the operational phase when flow is greater, the AADT threshold is not exceeded, even when data at different links onto the road network past the SSSI are combined. As such, air quality effects on the SSSI as a result of construction traffic flow is considered **not significant**.

8.4.38 Construction phase effects on the SSSI in relation to direct habitat loss and other impacts such as dust deposition, and water quality are considered **not significant**.

Bricket Wood Common SSSI

8.4.39 The eastern section of EH South lies within the Impact Risk Zone for this SSSI. This SSSI is an area of formerly extensive lowland heath that developed on heavy, base deficient soils of the Boulder Clay. The site contains wetlands in the form of ponds and seasonal streams and areas of wet heath. Part of the site is ancient woodland of the Pedunculate Oak/ Hornbeam type. The woodland supports the largest colony of violet helleborine *Epipactis purpurata* in Hertfordshire, and there is a rich bryophyte flora including species of Sphagnum characteristic of lowland heath in wetter areas where drainage is poor. Heathland species include heather *Calluna vulgaris*, purple moor-grass *Molinia caerulea*, heath grass *Danthonia decumbens*, heath milkwort *Polygala serpyllifolia* and heath spotted orchid *Dactylorhiza maculata*, all of which are uncommon or rare in the county. It is understood also to support a population of great crested newts, bats, badger, and various butterflies including white admiral, purple emperor and silver-washed fritillary although these do not form part of the citation.⁷⁹ Birds of note that are confirmed or considered possibly breeding on the site include lesser spotted woodpecker, red kite, and hobby.

8.4.40 The SSSI is located 4.7km to the south of the Site on the opposite side of the M1 motorway and within the M25 east of Abbots Langley and North Watford. Despite this, the intervening landscape between the Site and the SSSI is relatively rural and undeveloped, including areas of woodland, farmland and small villages.

8.4.41 At this distance, there is no realistic scope for disturbance of protected or otherwise notable species from construction activities on the Site, for example, Schedule 1 birds, badger or great crested newt. There is no direct hydrological connectivity between the Site and the SSSI which could otherwise lead to waterborne pollution and impacts on wetland habitats or its inhabitants, and it is beyond the distance that any potential effects from dust deposition generated as a result of construction activities on site would be felt.

8.4.42 The SSSI lies, at its closest point (Mutchetts Wood - Unit 4), within 75m of the M1 motorway, but the vast majority (98.19%) of this 70ha site is well over 200m from the motorway. At the last assessment in 2010, the SSSI unit is regarded as being in unfavourable condition due to inappropriate woodland management and deer browsing⁸⁰. It is feasible that the M1 motorway at this point could see higher than baseline traffic movements during the construction phase, and that levels of pollutants namely NO_x, NH₃, SO₂ and N deposition, increase temporarily on

⁷⁹ Bricketwood Common GAP 2017-22 Site Specific Plan Draft

⁸⁰ <https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1004687>

the SSSI unit during the construction phase. Broadleaved woodland habitats such as those present on the unit are particularly sensitive to such emissions, with typical effects being increased risk of drought stress and uprooting, crown discoloration, changes in mycorrhizal flora and reduction in the numbers of large sporocarps, fruiting bodies, increased defoliation by leaf feeders; a loss of understory species diversity and lichens, adverse effects on epiphytic growth on oaks, and changes to soil chemistry and fauna.

- 8.4.43 Traffic data at the nearest modelled link location (M1 Junction 7 south) shows that predicted construction traffic flow will not exceed the AADT threshold (at 724 LDV and 64 HDV. In addition, only a very small proportion of the SSSI falls within 200m of the M1 (c. 1.81%) and the habitat in this zone consists of a mosaic of secondary woodland with a very dense structure caused by self-set young oaks, rather than high forest ancient woodland⁸¹. As such it is highly unlikely that there will be a significant effect on sensitive woodland habitats sufficient to affect the integrity of the SSSI. This is therefore assessed as **not significant**, both alone and in-combination.
- 8.4.44 Construction phase effects on the SSSI in relation to direct habitat loss and other impacts such as dust deposition, water quality and disturbance are considered **not significant**.

Ashridge Commons and Woods SSSI

- 8.4.45 This SSSI, which underpins Chilterns Beechwoods SAC, comprises a mosaic of different habitats including ancient semi-natural and secondary woodland (including types *Fagus sylvatica-mercurialis perennis* and *Fagus sylvatica-Rubus fruticosus*), plantation, scrub, a more open component dominated by bracken, and grassland, including *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland. The site supports an exceptionally rich breeding bird community of both county and national rarities, including species rarely found elsewhere in Hertfordshire such as redstart, nightingale and wood warbler. The nationally rare firecrest is found here at one of its two known county localities. Other species breeding in good numbers at this site include tree pipit, lesser spotted woodpecker and hawfinch. The ancient semi-natural stands on the scarp slopes are usually of beech. In areas with a more basic soil, the plant community is rich and includes locally uncommon fly orchid *Ophrys insectifera*, violet helleborine and yellow bird's-nest *Monotropa hypopitys*, as well as the nationally rare narrow-lipped helleborine *Epipactis leptochila*, green flowered helleborine *E. phyllanthes* and stinking helleborine *Helleborus foetidus*. Small areas of unimproved calcareous grassland is characterised by locally uncommon yellow-wort *Blackstonia perfoliata* and autumn gentian *Gentianella amarella*, whilst of county important in the acidic grassland is the presence of heath-grass and trailing St John's wort *Hypericum humifusum*. Additional interest is provided by small ponds scattered throughout the site which support amphibians and various invertebrates with stag beetle one of the qualifying interest features of the SAC.
- 8.4.46 The Site lies within the Impact Risk Zone for this SSSI which is located 7.8km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the River Gade corridor, farmland and small areas of woodland. At this distance, there is no realistic scope for disturbance of protected or otherwise notable species such as the Schedule 1 firecrest from construction activities. There is no direct hydrological connectivity between

⁸¹ <https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1004687>

the Site and the SSSI which might otherwise lead to waterborne pollution, and it is beyond the distance that any potential effects from dust deposition generated as a result of construction activities on site would be felt.

8.4.47 Ashridge Commons and Woods SSSI lies adjacent to the B4506 which, theoretically, could be used by construction site traffic accessing the Site via, for example, the A4251 and A414 and may mean that levels of pollutants, namely NO_x, NH₃, SO₂ and N deposition, increase temporarily during the construction phase. The beech woodland and grassland habitats present within the SSSI are sensitive to such pollutants and an exceedance of critical levels can modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it. The SSSI is, as of 2022 (the date it was last assessed) in favourable condition⁸². Air quality is not flagged in the SSSI condition assessment, Views about Management (VAM) or Operations requiring Natural England Consent (ORNEC) documents as a concern, but maintaining the concentrations and deposition of air pollutants below the site-relevant Critical Load or Levels is a target within the SACO for the Chilterns Beechwoods SAC⁸³.

8.4.48 Traffic data at the nearest modelled link locations that would allow access onto roads past the SSSI (e.g. the A4251 west of Box Lane near Winkwell, and the B440 Leighton Buzzard Road and Piccotts End Road (north of Link Road) show that predicted construction traffic flow falls well below the AADT thresholds. At link 81 further east (A4251 west of Featherbed Lane) traffic flow is higher at 255 LDV and 45 HDV, but still well below the threshold. In addition, the CEMP includes for the avoidance of the use of the B4506 past the SSSI for construction purposes. As such it is highly unlikely that there will be a significant effect on sensitive woodland habitats sufficient to affect the integrity of the SSSI. Air quality effects during the construction phase on this SSSI are therefore assessed as **not significant**.

8.4.49 Construction phase effects on the SSSI in relation to direct habitat loss and other impacts such as dust deposition, water quality and disturbance are considered **not significant**.

Tring Woodlands SSSI

8.4.50 The SSSI, which underpins Chilterns Beechwoods SAC, is located 16.4km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the River Gade corridor, farmland and small areas of woodland. Potential impact pathways on the SSSI during the construction phase are in relation to air quality only owing to the SSSI's proximity adjacent to the A41.

8.4.51 Traffic data at the nearest modelled link locations that would allow access onto roads past the SSSI (e.g., the A4251 west of Box Lane near Winkwell, and Two Waters Way south of the A4251 show that predicted construction traffic flow falls well below the AADT thresholds. At link 81 further east (A4251 west of Featherbed Lane) traffic flow is higher at 255 LDV and 45 HDV, but still well below the threshold. As such it is highly unlikely that there will be a significant effect on sensitive woodland habitats sufficient to affect the integrity of the SSSI. Air quality effects during the construction phase on this SSSI are therefore assessed as **not significant**.

⁸² <https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1001729&SiteName=Roughdown%20Common%20SSSI>

⁸³ Natural England (2018) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Chilterns Beechwoods Special Area of Conservation (SAC) Site Code: UK0012724. <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012724.pdf>

- 8.4.52 Construction phase effects on the SSSI in relation to direct habitat loss and other impacts such as dust deposition, water quality and disturbance are considered **not significant**.

Non-Statutory Designated Nature Conservation Sites

Westwick Row Wood LWS

- 8.4.53 Lying within the Site boundary, Westwick Row Wood LWS comprises a 0.75ha area of old, possibly ancient, semi-natural broadleaved woodland with an understorey of hazel and ancient woodland indicator species at ground level. It is bounded to the north by the Westwick Row Road, and on other sides by farmland. It is linked to hedgerow habitat along the A4147 Hemel Hempstead Road by a native hedgerow with trees which runs from the south-west corner of the woodland.
- 8.4.54 Although the woodland itself is to be retained in its entirety, there is potential for damage and degradation of the habitat during construction, without appropriate safeguard measures. This might include physical damage to trees and shrubs and compaction of soils within the root zone by the passing of heavy vehicles and plant, or the inappropriate storage of materials. This may lead to root damage such that sufficient water and nutrients cannot be absorbed and the root system can no longer provide an anchoring function for the tree, making it susceptible to windthrow. Damage may occur to branches and trunks of trees on the edges of the woodland which increases the risk of disease and rot and potentially reduces the longevity of the tree. Pollution of soils from oil and fuel spills and other chemicals, may also adversely affect soil chemistry and toxicity.
- 8.4.55 The deposition of dust generated by nearby construction activities has the potential to affect photosynthesis, respiration, transpiration and to allow the penetration of phytotoxic gaseous pollutants, all of which may ultimately alter community structure. Where present, epiphytic lichens and bryophytes can be particularly sensitive. The woodland lies within 50m of areas expected to be under active construction works on all sides.
- 8.4.56 To prevent such effects, the CEMP will set out the measures required to avoid impacts in line with good practice guidelines for works on construction sites. An appropriate buffer or stand-off from the woodland edge will be clearly demarcated and signed to prevent accidental incursion by vehicles and plant, the inappropriate storage or dumping of materials and waste, and in order to reduce the risk of dust deposition. Vehicles will not be stored or refuelled close to the woodland and spill kits will be available on-site. Dust deposition will be further managed by employing measures to wet or cover/ contain material and due diligence exercised during loading and unloading materials to suppress dust creation within construction areas, and water sprays will be used to manage dust and prevent it drifting to the woodland during site operations and vehicle and plant movements, particularly in dry conditions.
- 8.4.57 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on Westwick Row Wood LWS during the construction phase from habitat loss, damage, contamination and dust deposition, and this is therefore **not significant**.

Nickey Way Dismantled Railway LWS

- 8.4.58 This 4.07ha linear site comprises part of the disused railway within EH North bordered by areas of rough neutral grassland, tall herbs, wooded hedgerow and scrub. It links with the Disused Railway Line, Hemel Hempstead LWS at its western end, and together they form an important, more or less connected, landscape feature linking Hemel Hempstead with the M1 motorway corridor and Redbourn village and river valleys (Ver and Red) beyond.
- 8.4.59 The Sustainable Transport Corridor (STC) which is to run north-south through the Site will bisect the LWS at grade towards the west, approximately a sixth of the way along its the length. This will result in the loss of two sections of species-rich native hedgerow with trees and areas of rough neutral grassland and tall herbs. The option to cross at grade (as opposed to the construction of a road bridge over the Nickey Line, or underpass under it) was deemed favourable as it minimises the earthworks required and the impact on the landscape and allows for greater retention of the hedgerows. It is expected that the construction of the crossing will result in the loss of at least 12.4m (comprising 6.4m of carriageway, and 3m either side for proposed footway/ cycleway) of hedgerow with trees on either side of the Nickey Line, together with small losses of associated neutral grassland and tall herb vegetation.
- 8.4.60 There is potential for damage and degradation of the retained habitat during construction, without appropriate safeguard measures. This might include physical damage to trees and hedgerow and compaction of soils within the root zone by the passing of heavy vehicles and plant, or the inappropriate storage of materials, damage to branches and trunks of trees and the pollution of soils from oil, fuel spills and other chemical spills.
- 8.4.61 Nearby construction activity, such as cut and fill operations, building demolitions such as that at Wood End Farm, and vehicle and plant movements, has the potential to generate dust which may be deposited on vegetation along the Nickey Line. This may affect photosynthesis, respiration, transpiration and to allow the penetration of phytotoxic gaseous pollutants, all of which may ultimately alter community structure. Where present, epiphytic lichens and bryophytes can be particularly sensitive. A proportion of the habitat along the Nickey Line within the Site lies within 50m of areas expected to be under active construction works, both to the north and south (road construction and residential areas).
- 8.4.62 The LWS lies within a dry valley and sits at a lower elevation to the Site to the north and south. There is a 1 in 30 chance of surface water flooding each year in places along the feature⁸⁴. Should contaminated runoff from active construction areas accumulate in these areas, there is a risk of effects from oil, fuel and other chemicals on the soil and habitat within the LWS.
- 8.4.63 To prevent such effects, the CEMP will set out the measures required to avoid impacts in line with good practice guidelines for works on construction sites as set out in the proposed mitigation for LWSs.
- 8.4.64 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on the LWS during the construction phase from damage to, or contamination of, retained habitats and dust deposition and is therefore **not significant**.

⁸⁴ [Map - Flood map for planning - GOV.UK](#)

- 8.4.65 The extent of habitat removed when considered relatively in view of the total length of the Nickey Line (~2km) will be a very small proportion and therefore habitat loss to construction is considered to be **not significant**.
- 8.4.66 There is the potential for disturbance and injury of species associated with the Nickey Line associated with construction traffic and works. This will be addressed within the CEMP, with appropriate measures put in place to minimise disturbance and speed restrictions will be in place for construction traffic. Features to provide habitat connectivity across the STC (e.g., 600mm tunnels with planting/fencing to funnel small mammals to safe crossing and 'hop-overs' for bats/birds) will be established at the earliest opportunity.
- 8.4.67 The Nickey Line will be within the Country Park setting and associated works in proximity to it will be relating to habitat creation and enhancement in the main (e.g., construction of multi-value SuDS features, tree and scrub planting). These will cause temporary disturbance effects, noting that farm machinery and activities form part of the current land-use context, and will lead to overall ecological enhancement of the context and biodiversity value of the Nickey Line in the medium to long-term. Habitat severance and the potential for injury/mortality of species associated with the Nickey Line are therefore considered likely to result in a minor adverse effect, considered to be **not significant**.

Disused Railway Line, Hemel Hempstead LWS

- 8.4.68 This linear site extends west from the Nicky Way Dismantled Railway LWS above west of Cherry Tree Lane. A small proportion of the 4.90ha site lies adjacent to the western corner of EH North. The banks are predominantly lined with old secondary woodland (mainly ash, oak and beech but with some hybrid black poplar, and other species, including hazel and holly in the shrub layer. Scrub is also present with rare small areas of rough grassland and tall herbs where the canopy opens out.
- 8.4.69 No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The LWS also lies at a higher elevation than the Site.⁸⁵ making potential effects from any contaminated surface water runoff unlikely, particularly given the presence of Cherry Tree Lane between the Site and the habitats of the LWS.
- 8.4.70 As for the Nicky Way Dismantled Railway LWS above, nearby construction activity and vehicle and plant movements associated with the residential development (within c. 50m) has the potential to generate dust which may be deposited on vegetation along the Disused Railway Lane. To prevent such effects, the CEMP will set out the measures required to avoid impacts in line with good practice guidelines for works on construction sites, as set out above for the Nicky Way Dismantled Railway LWS.
- 8.4.71 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on the Disused Railway Line, Hemel Hempstead LWS during the construction phase from loss, damage or contamination of habitats and dust deposition and is therefore **not significant**.

⁸⁵ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

Blackwater Wood LWS

- 8.4.72 This 3.24ha ancient semi-natural woodland lies c. 240m to the south of the Site on the opposite side of the A4147 Hemel Hempstead Road and within a parcel of farmland. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The LWS also lies at a higher elevation than the Site⁸⁶ making potential effects from any contaminated surface water runoff unlikely. Indirect effects from dust deposition are also unlikely at these distances.
- 8.4.73 The woodland lies over 200m from the A4147 Hemel Hempstead Road and Blackwater Lane and just shy of 200m of Bedmond Road to the south. At these distances, it is considered that there will be no noticeable effects on air quality from any increase on these roads by construction traffic.
- 8.4.74 As such, effects on Blackwater Wood LWS during the construction phase are **not significant**.

Westwick Hall LWS

- 8.4.75 This site is designated for its population of brown long-eared bats and Natterer's bats. It site lies c. 280m east of the Site on the opposite side of the M1 motorway, near the Gorhambury Estate. No direct impacts on habitats or features within the LWS will occur as a result of construction activities.
- 8.4.76 At this distance, it is possible that bats present within the LWS could use the Site for foraging; however, far higher quality habitats are present in and around the Gorhambury Estate and along the River Ver to the east of the LWS. The presence of the illuminated and busy M1 motorway corridor and A414 between the LWS and Site is also likely to deter Natterer's and brown long-eared bats from significant movements to the west onto the Site and present a notable mortality risk to these low flying species. Underpasses are present at Hogg End and Punchbowl Lane, though these are 2km from the LWS. As such, it is not considered that the Site is likely to represent a supporting foraging or commuting resource as part of the core sustenance zone for bats at this LWS.
- 8.4.77 Temporary loss of habitat to the east of the M1 (at EH East) will occur, affecting a highway's drainage basin, grassland and scrub habitats but again this is subject to potential lighting and noise disturbance from the road network in comparison with closer habitats to the east of the LWS.
- 8.4.78 Indirect effects of construction noise and visual intrusion from lighting on bats within the LWS itself is highly unlikely given the distance and the presence of the M1 motorway which will already be a significant source of noise and artificial lighting. Disturbance associated with night-time working will be avoided under the CEMP.
- 8.4.79 The effects on Westwick Hall LWS as a result of temporary habitat loss on the Site during the construction phase are considered likely negligible and **not significant**.

Potters Crouch Plantation LWS

⁸⁶ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

8.4.80 This c. 54ha plantation woodland containing ancient semi-natural woodland lies c. 290m to the south of the Site on the opposite side of the A4147 Hemel Hempstead Road beyond the golf course. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. Indirect effects from dust deposition are unlikely at these distances. Such effects are therefore considered **not significant**.

Holy Trinity Church, Leverstock Green LWS

8.4.81 This 0.64ha LWS lies within the churchyard of the Holy Trinity Church located c. 330m west of the Site adjacent to the south side of A4147 Hemel Hempstead Road at Leverstock Green. It comprises old neutral grassland with indicator species. No direct impacts such as habitat loss or fragmentation will occur as a result of construction activities on Site, and there is no direct hydrological connectivity via overground watercourses. The LWS also lies at a higher elevation than the Site⁸⁷ making potential effects from any contaminated surface water runoff unlikely. Indirect effects from dust deposition are also unlikely at these distances.

Kettlewell's Farm Area LWS

8.4.82 The buildings and environs of this LWS are important for bats. Records indicate the presence of a maternity colony of brown long-eared bats, an occasional serotine roost and an unspecified Natterer's bat roost within buildings at the site.

8.4.83 The site lies c. 530m east of the Site on the opposite side of the M1 motorway, south of Hogg End Lane, and c. 240m north-west of Windmill Hill Wood and Adjoining Woodland LWS and the Gorhambury Estate. The consideration of potential effects relevant to Westwick Hall LWS above are equally relevant to Kettlewell's Farm Area LWS, with the exception that serotine bats can be positively affected by lighting at the landscape scale⁸⁸ and serotine foraging activity was recorded around the balancing pond onsite to the east of the M1 (East EH) during the activity surveys. During the GCN surveys in 2025, the pond was however noted to be dry. The construction of two new larger multi-value SuDS ponds, with permanent water areas and associated habitat creation during the construction phase is considered to be of potential short-term disturbance but long-term benefit to serotine bats. However, serotine bats have core sustenance zones of around 4km⁸⁹ which includes the extensive resource of habitats associated with the Gorhambury Estate and River Ver. The majority of habitat within the site within East EH, and across the rest of the site west of the M1 is arable land of limited value to foraging bats and is therefore not considered likely to represent a notable supporting factor for an occasional serotine roost at this LWS.

8.4.84 Overall the likely effects on the LWS as a result of temporary habitat loss on the Site during the construction phase is considered negligible and **not significant**.

High Wood (Hemel Hempstead) LWS

⁸⁷ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

⁸⁸ Institution of Lighting Professionals (2023) Bats and Artificial Lighting in the UK. Guidance Note 08/23. Institution of Lighting Professionals and Bat Conservation Trust <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting>

⁸⁹ Collins, J. (ed.) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 4th edition. The Bat Conservation Trust, London. 2023.

8.4.85 This 2.29ha remnant ancient woodland lies c. 630m to the north-west of the Site to the north of the B487 Hemel Hempstead Road (Redbourn Road) and on the outskirts of the Cupid Green area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The LWS also lies at a higher elevation than the nearest areas of the Site⁹⁰ around B487 Hemel Hempstead Road (Redbourn Road) and the Nickey Line, making potential effects from any contaminated surface water runoff unlikely. Indirect effects from dust deposition are also unlikely at these distances.

Prae Wood LWS

8.4.86 This 110.4ha ancient semi-natural woodland with ancient fishponds lies c. 720m to the east of the Site on the opposite side of the M1 motorway and adjacent to the north of the A4147 Hemel Hempstead Road. Although not mentioned in the site citation, data search results suggest that it may support a population of Schedule 1 red kites and grizzled skipper, which is regarded as rare in the county. A maternity roost of brown long-eared bats is known from nearby Praewood Farm and it is highly likely the LWS is used for foraging by these and other bat species.

8.4.87 No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The presence of the A414 and M1 motorway corridor and distances involved removes the potential for any effects from contaminated surface water runoff. Indirect effects from dust deposition are also unlikely at these distances. Such effects are therefore **not significant**.

Woodhall Wood LWS

8.4.88 This 2.33ha remnant ancient semi-natural woodland lies c. 800m to the west of the Site within the Cupid Green area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. It is on a similar elevation to the majority of the Site, but the presence of the built form between the Site and the LWS makes potential effects from any surface water runoff unlikely. Indirect effects from dust deposition are also unlikely at these distances. Such effects are therefore **not significant**.

Appspond Wood LWS

8.4.89 This 4.91ha ancient semi-natural woodland has been largely replanted with pine. It lies c. 850m to the south-east of the Site on the opposite side of the M1 motorway near Potters Crouch. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The presence of the A414 and M1 motorway corridor and distances involved removes the potential for any effects from surface water runoff. Indirect effects from dust deposition are also unlikely at these distances. Such effects are therefore **not significant**.

⁹⁰ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

Windmill Hill Wood and Adjoining Woodland LWS

8.4.90 This 17.45ha avenue and planted woodland incorporates some ancient woodland fragments and neutral grassland. It lies c. 900m to the east of the Site on the opposite side of the M1 motorway, south of Hogg End Lane and part of the Gorhambury Estate. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The presence of the embanked M1 motorway corridor and distances involved removes the potential for any effects from surface water runoff. Indirect effects from dust deposition are also unlikely at these distances. As such, effects on Windmill Hill Wood and Adjoining Woodland LWS during the construction phase are **not significant**.

Great Revel End Farm LWS

8.4.91 This 3.94ha LWS comprises old and relatively undisturbed neutral grassland and is located c. 920m north of the Site on the opposite side of the A487, and to the south of Gaddesden Lane. No direct impacts such as habitat loss or fragmentation will occur as a result of construction activities on-Site, and there is no direct hydrological connectivity via overground watercourses. The LWS lies at a similar or lower elevation than the Site⁹¹ but the presence of the B487 Hemel Hempstead Road (Redbourn Road) and the distances involved remove any potential effects from surface water runoff. Indirect effects from dust deposition are also unlikely at these distances. Such effects are therefore considered **not significant**.

Widmore Wood LWS

8.4.92 This 3.55ha ancient semi-natural woodland lies c. 980m to the west of the Site near the Cupid Green area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The LWS lies at a higher elevation than the Site⁹² and the presence of built form and roads and the distances involved remove any potential effects from surface water runoff from the Site. Indirect effects from dust deposition will also not occur at this distance. Such effects are therefore considered **not significant**.

Birch Wood (near Potters Crouch) LWS

8.4.93 This 21.57ha ancient semi-natural woodland has been largely replanted with conifers. It lies just over a kilometre to the south-east of the Site on the opposite side of the M1 motorway near Potters Crouch and is bisected by the A414. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There are no mechanisms by which surface water runoff from the Site could affect the habitats present given the distances involved, intervening land use and topography of the area. Indirect effects from dust deposition will also not occur at this distance. Such effects are therefore **not significant**.

⁹¹ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

⁹² <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

Redbourn Common LWS

- 8.4.94 This common, which lies c. 1.16km to the north of the Site on the opposite side of the M1 motorway and B487 Hemel Hempstead Road (Redbourn Road) at Redbourn, contains mostly semi-improved neutral grassland but with several areas of more acidic grass present. The River Red, a tributary of the Ver, flows through the very southern-most part of the site. This originates from springs near the M1 motorway and is supplemented by run off from the motorway⁹³.
- 8.4.95 No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity between the Site and the LWS, including the River Red via overground watercourses. The embanked M1 motorway and distances between the Site and the LWS remove any potential for contaminated surface water runoff from the Site during construction to the River Red or Ver. Indirect effects from dust deposition will not occur at this distance. Such effects are considered **not significant**.
- 8.4.96 As set out in **ES Volume 2, Chapter 14: Water Resources and Flood Risk**, ground excavations are highly unlikely to encounter groundwater, although the risk will be considered as part of the construction methodology to make sure there are no indirect effects on the River Ver from interruption or contamination of flow. Underground groundwater monitoring is also currently underway to inform discussions with the Environment Agency to make sure there is no risk of contamination of aquifers from the nearby Buncefield oil storage facility. Water quality effects on the River Ver and the associated LWS are therefore unlikely during the construction phase and are therefore **not significant**.

Bury Wood (near Redbourn) LWS

- 8.4.97 This 3.88ha ancient semi-natural woodland of ash, oak and beech lies c. 1.17km to the north of the Site and west of Redbourn village. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses and the distance between the Site and the LWS removes any potential effects from surface water runoff from the Site. Indirect effects from dust deposition will also not occur at this distance. Such effects are considered **not significant**.

Maylands Wood LWS

- 8.4.98 This 3.63ha ancient semi-natural oak and ash woodland lies c. 1.17km to the west of the Site near the Cupid Green area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The LWS lies at a higher elevation than the Site⁹⁴ and the presence of built form and roads and the distances involved remove any potential effects from surface water runoff from the Site. Indirect effects from dust deposition will also not occur at this distance. As such, these effects are considered **not significant**.

⁹³ <https://www.riverver.co.uk/live-river-flow/>

⁹⁴ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

Gorhambury Cottage Area LWS

- 8.4.99 This LWS is designated for its brown long-eared bat population. The site lies c. 1.25km east of the Site and no direct impacts on habitats or features within the LWS will occur as a result of construction activities. The assessment of likely effects associated with Kettlewell's Farm Area LWS is also considered relevant to this LWS with the exception of serotine which are not specifically noted to be associated with this site. Far higher quality habitats are present in and around the Gorhambury Estate and along the River Ver to the east of the LWS.
- 8.4.100 The effects on the LWS as a result of temporary habitat loss on the Site during the construction phase are considered likely negligible and **not significant**.

Gorhambury Icehouse LWS

- 8.4.101 This LWS is designated on account of its Natterer's bat population. There is no clear indication of a bat roost within the site from the data search or Local Records Centre correspondence; however, the presence of an icehouse is highly indicative of a feature of importance for hibernating bats, and the small area of ancient semi-natural woodland within the site, and across the wider Gorhambury Estate is likely to be of value for foraging and possibly summer roosting.
- 8.4.102 The site lies c. 1.27km east of the Site and no direct impacts on habitats or features within the LWS will occur as a result of construction activities. At this distance, it is possible that bats present within the LWS will use the Site for foraging; however, far higher quality habitats are present in and around the Gorhambury Estate and along the River Ver to the east of the LWS.
- 8.4.103 The effects on the LWS as a result of temporary habitat loss on the Site during the construction phase are considered likely negligible and **not significant**.

Long Deans Wood LWS

- 8.4.104 This 12.61ha old semi-natural woodland lies c. 1.31km to the south-west of the Site on the opposite side of the A4147 Hemel Hempstead Road. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Such effects are therefore considered to be **not significant**.

Long Deans Meadow LWS

- 8.4.105 Lying adjacent to Long Deans Wood LWS to the east and Bunkers Road to the west, this 11.29ha old parkland site lies in a small valley and comprises both neutral and species-rich chalk grassland. It is situated 1.32km to the south-west of the Site on the opposite side of the A4147 Hemel Hempstead Road. As for Long Deans Wood LWS, no impacts will occur as a result of construction activities on site through habitat loss, fragmentation, water quality or dust deposition. Such effects are therefore considered to be **not significant**.

Wellfield Spring LWS

8.4.106 This c. 0.84ha ancient semi-natural oak and hornbeam woodland lies c. 1.42km to the south of the Site beyond the golf course and Potters Crouch Plantation. At this distance, no impacts will occur as a result of construction activities on-site through habitat loss, fragmentation, water quality or dust deposition. Such effects are therefore **not significant**.

Temple Cottage Area, Gorhambury LWS

8.4.107 This LWS is designated on account of its brown long-eared bat population. The LWS lies c. 1.45km east of the Site and no direct impacts on habitats or features within the LWS will occur as a result of construction activities.

8.4.108 The assessment of likely effects associated with Kettlewell's Farm Area LWS is also considered relevant to this LWS with the exception of the potential effects relating to serotine bats are likely to be less relevant to this specific site.

8.4.109 The effects on the LWS as a result of temporary habitat loss on the Site during the construction phase are considered likely negligible and **not significant**.

Ver Valley (by Chequer Lane) LWS

8.4.110 This 6.47ha site comprises disused watercress beds and the riverine habitats of the Ver and Red (in the north), with hybrid black poplar and white willow plantations. It lies 1.51km to the north-east of the Site on the far side of the M1 motorway and extending south-eastwards from the village of Redbourn.

8.4.111 No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity between the Site and the LWS via overground watercourses. The embanked M1 motorway and distances between the Site and the LWS remove any potential for surface water runoff from the Site during construction to the River Red or Ver. Indirect effects from dust deposition will not occur at this distance. As such, these potential effects are considered **not significant**.

8.4.112 As set out in **ES Volume 2, Chapter 14: Water Resources and Flood Risk**, ground excavations are highly unlikely to encounter groundwater, although the risk will be considered as part of the construction methodology to make sure there are no indirect effects on the River Ver from interruption or contamination of flow. Underground groundwater monitoring is also currently underway to inform discussions with the Environment Agency to make sure there is no risk of contamination of aquifers from the nearby Buncefield oil storage facility. Water quality effects on the River Ver and the associated LWS are therefore unlikely during the construction phase and are therefore **not significant**.

Rant Meadow Wood/ Bennets End Pit LWS

8.4.113 This 3.04ha site comprises old secondary broadleaved woodland with many deep hollows and pits. It lies c. 1.59km to the west of the Site within the Bennetts End area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust

deposition from the Site given the distance and intervening land use. Such effects are therefore considered **not significant**.

Featherbed Lane Copse by Serge Hill LWS

8.4.114 This 0.88ha LWS comprises an ancient green lane bordered by old laid hedges including wild cherry, field maple, hawthorn, hazel and holly and a small area of oak and ash woodland and mixed plantation to the west. It lies 1.60km south of the Site, alongside Featherbed Lane, a disused track that extends westwards from the M1 motorway to Sergehill and its junction with Whitehouse Lane. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Such effects are therefore considered **not significant**.

Potters Crouch Section LWS

8.4.115 This 0.53ha fragment of ancient oak and hornbeam coppiced woodland with an important geological chalk pit lies 1.63km to the south-east of the Site on the opposite side of the M1 motorway near Chiswell Green. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Such effects are therefore considered **not significant**.

Long Spring (Potters Crouch) LWS

8.4.116 This 1ha site represents a thin strip of ancient woodland mostly replanted with Scots pine and a little beech and lies c. 1.65km south-east of the Site near Potters Crouch, and south of Birch Wood (near Potters Crouch LWS). No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Construction phase effects on the LWS are therefore **not significant**.

Serge Hill Meadow LWS

8.4.117 This 1.48ha LWS represents a relatively recent meadow of MG1e (mesotrophic *Arrhenatherum elatius* grassland) with strong affinities to MG5 unimproved neutral grassland. It lies 1.70km to the south of the Site beyond Potters Crouch Plantation LWS. No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Construction phase effects on the LWS are therefore **not significant**.

Redbournbury Meadows LWS

8.4.118 These meadows, totalling c. 45.3ha in area, represent one of the finest stretches of relatively undisturbed river valley in the county. They consist of a mosaic of herb-rich marsh, grassland and scrub which border the River Ver and its associated streams and ditches. The LWS is also important as the only site in the county for aquatic liverwort *Ricciocarpus natans*, which is found in the ditches. The site is also of importance for wintering and breeding birds. It lies 1.73km east of the Site beyond the M1 motorway and A5183.

8.4.119 No direct impacts such as habitat loss, damage or fragmentation of habitat or disturbance of species such as breeding and wintering birds, will occur as a result of construction activities. There is no direct hydrological connectivity between the Site and the LWS via overground watercourses which might otherwise permit water pollution. The embanked M1 motorway and distances between the Site and the LWS remove any potential for surface water runoff from the Site during construction to the river and ditch network. Indirect effects from dust deposition will not occur at this distance. Such effects are therefore considered **not significant**.

8.4.120 As set out in **ES Volume 2, Chapter 14: Water Resources and Flood Risk**, ground excavations are highly unlikely to encounter groundwater, although the risk will be considered as part of the construction methodology to make sure there are no indirect effects on the River Ver from interruption or contamination of flow. Underground groundwater monitoring is also currently underway to inform discussions with the Environment Agency to make sure there is no risk of contamination of aquifers from the nearby Buncefield oil storage facility. Water quality effects on the River Ver and the associated LWS are therefore unlikely during the construction phase and are therefore **not significant**.

Hay Wood (Holtmere) LWS

8.4.121 This 5.96ha ancient broadleaved woodland site lies c. 1.77km north-west of the Site. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. As such, effects on Hay Wood (Holtmere) LWS during the construction phase are **not significant**.

Scrubs Wood LWS

8.4.122 This 2.09ha ancient semi-natural woodland site lies 1.88km south-east of the Site beyond the M1 motorway near Chiswell Green. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. As such, effects on Scrubs Wood LWS during the construction phase are **not significant**.

New Wood (W of Redbourn) LWS

8.4.123 This 3.22ha ancient semi-natural oak and ash woodland lies 1.93km north of the Site. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface

water runoff or dust deposition from the Site given the distance and intervening land use. As such, effects on New Wood (W of Redbourn) LWS during the construction phase are **not significant**.

Park Wood (near Chiswell Green) LWS

8.4.124 This 19.75ha area of ancient woodland has been almost completely planted with conifers, although the edges retain a semi-natural canopy with a more diverse flora below. It lies c. 1.94km to the south-east of the Site beyond the M1 corridor and near to Chiswell Green. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Such effects are therefore considered **not significant**.

Piecorner and Hanging Wood LWS

8.4.125 This 13.27ha area of ancient woodland comprises Piecorner Wood to the west and Hanging Wood to the east. It mainly supports old secondary woodland and mixed plantation. It lies 1.99km to the south of the Site near Bedmond. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use. Such effects are therefore considered **not significant**.

Habitats

Ancient woodland, ancient and veteran trees

8.4.126 There are 16 areas of woodland within a 2km radius of the Site that appear on the Ancient Woodland Inventory. All of these, with the exception of two, are designated as LWS, the closest being Blackwater Wood LWS located 240m south of the Site, and these are covered in the relevant LWS sections above.

8.4.127 In addition, there is a 1.79ha area of ancient (replanted) woodland at Square Wood which is contiguous with Prae Wood LWS on the east side of the M1 motorway, c. 960m east of the Site, and a c. 0.86ha area of ancient and semi-natural woodland (Yew Tree Wood) approximately 1.5km to the west of the Site within the Cupid Green area of Hemel Hempstead. No direct impacts such as habitat loss, damage or fragmentation of habitat will occur as a result of construction activities on these habitats, and there is no direct hydrological connectivity via overground watercourses. There is no mechanism for effects through surface water runoff or dust deposition from the Site given the distance and intervening land use.

8.4.128 Construction phase effects on Square Wood and Yew Tree Wood (ancient woodland) are therefore **not significant**.

Habitats of Principal Importance

Deciduous and Lowland Mixed Deciduous Woodland (on-site)

8.4.129 Two parcels of HPI deciduous woodland are located on the Site. Of these, one is designated as an LWS (Westwick Row Wood) and is noted to be old, possibly ancient woodland. As discussed above, the woodland will be retained in its entirety and protected from damage and degradation of the habitat and dust deposition during construction with appropriate safeguard measures which will be set out in the CEMP. The second parcel (lowland mixed deciduous) lies within EH North and will be retained and integrated within the proposed SANG and associated landscaping. As above, the HPI deciduous woodland will be protected during construction through standard site measures as set out in the CEMP.

8.4.130 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on the on-site parcels of HPI woodland during the construction phase from habitat loss, damage, contamination and dust deposition, and this is therefore **not significant**.

Deciduous Woodland (off-site)

8.4.131 There are numerous other parcels of HPI Deciduous Woodland within 2km of the Site, and beyond. For the vast majority, no noticeable effects (not significant) are anticipated in relation to habitat loss, damage or degradation through dust deposition or waterborne contamination on account of their distance from the Site and the intervening land use.

8.4.132 Those parcels lying within 50m of active construction works, for example, a linear area of woodland (c. 0.8ha) along Holtsmere End Lane just north of the B487 Hemel Hempstead Road (Redbourn Road), that adjacent to the north of Punchbowl Lane and east of Cherry Tree Lane (c. 0.26ha), and a larger area south of the A414 Breakspear Way around Marchmont Pond (c. 2.3ha), may be subject to dust deposition effects as a result of construction activities on the Site. Appropriate measures to avoid this will be set out in the CEMP such that these effects are considered to be **not significant**.

8.4.133 Only the woodland around Marchmont Pond lies within the construction ARN and so may be subject to significantly higher levels of vehicle emissions. Therefore, this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). This concluded that the calculated maximum Process Contribution (PC) for the Development does not exceed 1% of the critical load (Ndep) and therefore that air quality impacts on the HPI at this location can be considered **not significant**.

Coastal and Floodplain Grazing Marsh

8.4.134 There are four parcels of coastal and floodplain grazing marsh within 2km of the Site which have been valued at County level importance. The nearest two parcels are located beyond the M1 motorway, approximately 1.5km to the north-east of the Site along the River Ver adjacent to the A5183 and B487 Hemel Hempstead Road (Redbourn Road) just south of Redbourn village, close to the Ver Valley (by Chequer Lane) LWS. The other two lie on the east side of the A5183, also along the River Ver but within the LWS there.

8.4.135 As discussed for the LWS, no direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity between the Site and the HPI via overground

watercourses. The embanked M1 motorway and distances between the Site and the LWS remove any potential for surface water runoff from the Site during construction to the River Red or Ver. Indirect effects from dust deposition will not occur at this distance. Such effects are therefore considered **not significant**.

8.4.136 As set out in **ES Volume 2, Chapter 14: Water Resources and Flood Risk**, ground excavations are highly unlikely to encounter groundwater, although the risk will be considered as part of the construction methodology to make sure there are no indirect effects on the River Ver from interruption or contamination of flow. Underground groundwater monitoring is also currently underway to inform discussions with the Environment Agency to make sure there is no risk of contamination of aquifers from the nearby Buncefield oil storage facility. Water quality effects on the River Ver and the associated coastal and floodplain grazing marsh are therefore unlikely during the construction phase and are therefore **not significant**.

Wood Pasture and Parkland

8.4.137 There is one area of HPI Wood pasture and parkland (c. 200ha in size) within 2km of the Site centred around Gorhambury House and located approximately 400m to the east of the Site beyond the M1 motorway. This has been valued at County Level Importance.

8.4.138 No direct impacts such as habitat loss, damage or fragmentation will occur as a result of construction activities, and there is no direct hydrological connectivity via overground watercourses. The presence of the embanked M1 motorway corridor and distances involved removes the potential for any effects from contaminated surface water runoff. Indirect effects from dust deposition are also unlikely at these distances. Such effects are therefore considered **not significant**.

Traditional Orchards

8.4.139 There are eight parcels of traditional orchard within 2km of the Site, the closest of these is adjacent to the Site in the south-west, along Westwick Row. This orchard will not be directly affected by construction works, although due to its proximity to the Site there is potential for damage and degradation of the habitat during construction, without appropriate safeguard measures. This might include physical damage to trees and compaction of soils within the root zone by the passing of heavy vehicles and plant, or the inappropriate storage of materials. Damage may occur to branches and trunks of trees on the edges of the woodland which increases the risk of disease and rot and potentially reduces the longevity of the tree. Pollution of soils from oil and fuel spills and other chemicals, may also adversely affect soil chemistry and toxicity.

8.4.140 The deposition of dust generated by nearby construction activities has the potential to affect photosynthesis, respiration, transpiration and to allow the penetration of phytotoxic gaseous pollutants, all of which may ultimately alter community structure.

8.4.141 To prevent such effects, the CEMP will set out the measures required to avoid impacts in line with good practice guidelines for works on construction sites as set out in the mitigation for LWS's.

8.4.142 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on HPI traditional orchards during the construction phase from habitat loss, damage, contamination and dust deposition, and this is therefore **not significant**.

HPI Hedgerows

8.4.143 Of the 88 hedgerows spread across the Site, 86 were able to be fully surveyed. All 88 are classed as HPI (28.1km), whilst 61 hedgerows are additionally classed as 'Important hedgerows'. These hedgerows are considered important at the Local level.

8.4.144 Of the 28.1km of HPI Hedgerow, 5.154km are to be lost to the Development during the construction phase. This constitutes approximately 18% of the total hedgerows on site. This would be considered to be a **significant impact** from habitat loss, damage or fragmentation as a result of construction activities. Mitigation measures are therefore proposed in Section 8.5 with retained hedgerows being improved and new hedgerows planted.

8.4.145 Those parcels lying within 50m of active construction works, may be subject to dust deposition effects as a result of construction activities on the Site. Appropriate measures to avoid this will be set out in the CEMP such that these effects are considered to be **not significant**.

Species

Badger

8.4.146 Mitigation and compensation for impacts through direct habitat loss and fragmentation of habitat during the construction phase have been embedded into the design of the Development masterplan and are taken into account during the following assessment. As part of the licensing process, there is a requirement to provide an artificial sett for each main sett to be lost to the Development. Likewise standard best-practice measures to avoid accidental damage or degradation of retained habitat, accidental killing or injury, and to avoid or reduce impacts through e.g., noise, light and visual disturbance will be set out within a CEMP to be conditioned and discharged prior to commencement of works to the satisfaction of the Local Planning Authority. All avoidance, mitigation and compensation measures will, ultimately, be secured through a mitigation licence from Natural England post-consent but prior to the commencement of works to make sure legal compliance with the Conservation of Habitats and Species Regulations 2017 (as amended). Measures required by Natural England to meet the conditions of the mitigation licence, a prerequisite of licence issue, standardised measures within the CEMP covered by other forms of legislation or controls, and committed secondary mitigation such as that shown on design plans, are regarded as embedded mitigation for the purpose of the following assessment.

Habitat loss and fragmentation

8.4.147 Three main setts will require closure under licence from Natural England with replacement artificial setts a requirement of the mitigation licence. In addition, a number of outliers may also require closure, although these will be retained where possible, for example, where they lie along a retained hedgerow or within a green space,

and are not considered likely to be subject to significant disturbance during either the construction or operational phase from activities on Site.

- 8.4.148 Optimal foraging habitats for badger on Site include modified and neutral grassland, particularly where these are short sward or grazed, and broad-leaved woodland; these typically support high earthworm biomass, a favoured food item of the species. There will be a loss of both habitats to the construction phase, particularly in the west of EH South (horse-grazed grassland) and south of Green Lane, and along the eastern boundary with the M1 motorway where there will be a requirement for temporary removal of plantation woodland, scrub and grassland to create a new noise bund (this will subsequently be planted up once earthworks are complete).
- 8.4.149 The majority of habitat to be lost to the Development will be arable farmland. Although regarded as a secondary habitat for badger, root and grain crops can, nonetheless, be an important source of food for badgers in times when preferred food items such as earthworms are not accessible, for example, during particularly dry or cold spells when the ground is hard or frozen. Cereal fields can also yield relatively high densities of earthworms.
- 8.4.150 Scrub and hedgerow losses will occur during the construction phase. Whilst not of primary importance for foraging, they afford cover and connectivity across the landscape. Most of the scrub loss will occur along the eastern boundary with the M1 motorway during the creation of the noise bund and landscape buffers. Hedgerows are to be retained wherever possible; however, some loss will occur to the road network, including the STC and junction works, as well as-built form.
- 8.4.151 The creation of the Country Park, Valley Park and green corridors embedded within the design of the Development masterplan will ultimately provide habitat of higher quality to badgers than that lost to the proposals. This is to be created early on within the construction programme within each development phase as it is brought forward. Although details are not available at this stage, the phasing of the Development will realistically be such that not all existing arable and other habitats will be removed across the whole Site simultaneously – this is likely to take place in a staggered fashion over at least a five-year period between 2028 and 2033 and potentially longer in some areas that do not require enabling works. However, there will, nonetheless, remain some time lag between suitable habitat being lost and the newly created habitat becoming established and of full value to badger.
- 8.4.152 The average size of a badger social group territory is c. 50ha but dependent on habitat quality and food availability, they can be c. 30ha in good rural habitat, and as small as 5ha, particularly in urban/suburban areas where gardens may afford rich food sources, including from bird tables, food waste or artificial feeding. Five badger social groups are known to utilise the Site currently, which suggests home ranges are smaller than average and habitats are of relatively high quality.
- 8.4.153 It is considered highly likely that badgers associated with Sett 5 off-site to the south will already be relying extensively on off-site habitat beyond the A4147 Hemel Hempstead Road, particularly around the golf course and woodlands. The loss of habitat on-site to this social group is therefore not anticipated to be significant or to greatly increase the risk of road traffic mortality.

- 8.4.154 Two other social groups utilise habitats within EH South – those associated with Sett TEM14 (on-site) and with Sett 11 (off-site to the west). Sett TEM14 will be subject to closure under licence in advance of works commencing, with an artificial sett created within an area of greenspace slightly to the north. The impact of habitat loss on-site to these groups is likely to be higher, given the loss of short sward grassland (used by badgers from Sett 11) and access to alternative suitable habitat to the east being restricted by the M1 motorway (Sett TEM14). Some movements beyond normal territorial boundaries may therefore be expected, particularly to the south, which may increase conflict with neighbouring groups and road traffic mortality on the A4147 Hemel Hempstead Road and possibly the M1 motorway. It will be important that habitat connectivity remains between the new sett and areas of foraging outside of the construction footprint, particularly when the works to the noise bund are underway. The Valley Park and associated green corridors and retained hedgerows have the potential to provide this but consideration of the phasing of works at the detailed design stage will be required to make sure badgers are not effectively left isolated from suitable habitat during construction.
- 8.4.155 Badgers associated with Sett 31/14 are utilising habitat within EH Central, extending from the A414 Breakspear Way and beyond Punchbowl Lane to the north. Sett 31/14 will be subject to closure under licence in advance of works commencing, with an artificial sett created within an area of greenspace to the east of Green Lane. The majority of on-site habitat within the area known to be used by this social group is arable. It is likely that they are also utilising off-site habitat to the west such as the cemetery, which will remain accessible during construction and may therefore become more important as a resource. Habitats to the east of the M1 motorway may be accessible via two motorway underpasses (Punchbowl Lane and Hogg End Lane) but there are no data to support this either way. The loss of on-site habitat during the construction phase may increase the use of habitats to the north or to the south beyond the A414 Breakspear Way with a risk of associated mortality through interactions with other social group and road traffic incidents.
- 8.4.156 A single social group is known to utilise EH North associated with Sett A-C, and its annex Sett 18. The majority of higher quality habitat will be retained during construction and suitable habitat off-site is available to the west of Cherry Tree Lane and north of the Nickey Line (although it is not known what the spatial configuration of other social group territories is in these areas). The habitat in the east of EH North will not be developed, this eventually forming part of the Country Park, and annex Sett 18 will be retained. Main Sett A-C will require closure prior to construction works commencing due to its proximity to the STC that runs north-south through the Development and crosses the Nickey Line. An artificial sett will be created slightly to the north-east within the area proposed for the Country Park. Badgers from this social group will have continued access to the newly created habitats in the east of EH North, and along the Nickey Line east and west which may allow access to existing off-site resources. Surveys by FPCR recorded a single social group off-site within land for the North Hemel development, using the hedgerow north of the B487 Hemel Hempstead Road. Results of the bait marking studies by FPCR and Temple indicate that these are two separate social groups and that the B487 acts as a territorial boundary between the two groups. Any additional movements northwards across the B487 Hemel Hempstead Road (Redbourn Road) may bring about an increase in territorial conflict between these two groups as well as increasing the risk of road traffic collisions here and there will also be further development to the north of the B487 Hemel Hempstead Road (Redbourn Road) which may cumulatively affect badgers in this area.

8.4.157 There is the potential for accidental damage and degradation of retained habitat during construction in the absence of mitigation to prevent it, such that they become less suitable for badger. Such measures will be set out within the CEMP and will include the erection of fencing (e.g., line-wire or post and rope fencing to allow wildlife to pass freely), pollution prevention and dust suppression controls).

8.4.158 Considering the measures embedded within the Development, the likely phasing of works with the provision of the Country Park, Valley Park and green corridors delivered as early as possible (and prior to occupation) within each development phase, the measures to be set out within the CEMP, and the presence of suitable habitat in the wider landscape, it is considered that the effects arising from habitat loss and fragmentation on this receptor is negative at the Site level, and temporary, reversible once construction is complete and habitats are fully established. This will result in a **not significant** effect on badgers.

Killing or Injury

8.4.159 Construction activities have the potential to result in the direct mortality or injury to badgers whilst occupying a sett. Three main setts will require closure under licence in advance of construction- Sett 31/14 in EH Central, Sett TEM14 within EH South, and Sett A-C within the Nickey Line in EH North. It is assumed that six outlier setts (five active or partially active, and one currently disused) will also require closure across the Site. In EH North, this includes two outliers within the application boundary for the B487 Hemel Hempstead Road (Redbourn Road) junction (TEM 1 and TEM2) and for the purposes of this assessment it is assumed TEM9 which sits within the maximum extent of the potential alignment of the Sustainable Transport Corridor (STC), would also require closure. In EH Central, sett 58 (an active outlier) will require closure alongside the main sett 31/14 and in EH South, sett 2022 (6), an active outlier, and TEM 12 (disused outlier) are also located within the maximum extent of the potential alignment of the STC. Damage or destruction of setts that are to be retained by accidental incursion by plant and vehicles which may also lead to killing and injury of any badgers present in the absence of mitigation.

8.4.160 The closure of setts under licence is considered embedded in the proposals as this is required in order to comply with the relevant legislation regardless of the EIA process. Setts will be excluded and closed in line with best practice and as agreed by Natural England in advance of works such that killing and injury will be avoided. Accidental damage to retained setts and killing or injury to badgers within will be avoided by the measures outlined within the CEMP, to include 30m buffer zones around retained setts which will be clearly demarcated and signposted throughout the construction phase.

8.4.161 Away from the setts, construction site hazards pose a risk of killing or injury to badgers whilst they are foraging or exhibiting other behaviours such as dispersal and territorial defence. This may arise through vehicle collisions, if works are ongoing after dark, or by becoming trapped in excavations left open overnight. This could potentially cause effects at the social group level, for example in the event that a breeding female with dependent cubs was injured or killed.

8.4.162 As part of measures outlined in the CEMP, all excavations will either be securely covered overnight or will be fitted with a means of escape which will remove the risks associated with entrapment. Construction works will be comparatively limited after dark and site traffic and plant will be subject to a speed limit of 15mph.

8.4.163 As such, it is not anticipated that there will be any noticeable effect on badgers through direct killing or injury during the construction phase and is therefore considered **not significant**.

Disturbance

8.4.164 Badgers may be subject to disturbance whilst within retained setts during construction activities, and away from setts whilst foraging and commuting through increased noise and visual disturbance. The degree of disturbance to badgers within setts will be dependent on the nature of the activity and machinery used, the local topography and the distance of the operation from the sett.

8.4.165 Surveys have shown that there are six main setts on or near the Site. Three of these (on-site) will require closure under licence in advance of construction works (Setts TEM14, 31/14 and A-C), as well as those non-main setts listed above. As such, no construction disturbance to badgers within these setts will occur during the construction phase itself, although some disturbance is inevitable pre-works during the exclusion process which will be subject to measures agreed by Natural England to reduce this to an acceptable minimum.

8.4.166 Artificial setts will be created as compensation for the loss of any main setts as will be required under mitigation licences. These will be located within appropriate areas of proposed greenspace away from disturbance with connected habitat to be agreed with Natural England.

8.4.167 To be sure of legal compliance with the Protection of Badgers Act, retained setts on or adjacent to the Site will require protection by an appropriate buffer (radii to be determined by topography and nature of disturbance source) or stand-off to be set out in CEMP and this will avoid/minimise noise or vibration disturbance to badgers within these setts during the construction phase. Those that may be subject to particular disturbance from construction activities in EH North include the active outliers TEM45, TEM6, and 17, and annex setts TEM 17 and 35 – these lie close to either the STC footprint or the area that can accommodate a sports hub in the east. To an extent, badgers using setts close to main roads and built-up areas, for example, main setts 5, 11 and 37, will already be somewhat habituated to some baseline noise from passing vehicles and human activity, and those within arable areas, to noise from farm machinery.

8.4.168 Given the measures embedded within the Development and as will be obligated under the mitigation licence, and the phasing of the construction, which is such that any disturbance to all badgers present across the Site would not happen simultaneously, it is considered that the impact arising from disturbance during the construction phase on this receptor of local importance is negative, but temporary, with effects reversible once construction is complete and is significant at the Site level only.

8.4.169 This will result in a **not significant** effect on badgers.

Bats

8.4.170 All British species of bat are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). Under this legislation it is an offence to deliberately capture, kill or disturb a bat and to damage, destroy or obstruct access to a bat roost.

8.4.171 The following key ecological findings have been identified:

- The Site is assessed as being used by an assemblage of bats of **Regional** level importance for foraging and commuting due to the diversity of species present.
- Surveys have revealed that B18 contains at least three bat roosts (day roosts for common pipistrelle, soprano pipistrelle, and brown long-eared bat), B6 contains a day roost for brown long-eared bats, and B2 contains a day roost for common pipistrelles. T68 also supports a common pipistrelle occasional/transitional roost and a historic (2014) day roost for common pipistrelle (2 bats) in T12/13 is precautionarily considered to remain present. These roosts are of **Site** Importance.
- The potential presence of a barbastelle roost in Westwick Row Wood and potentially in woodland in the north-east of the site is considered to be of **District** Importance.
- The wider tree roosting resource on-site and potential for 'non-classic' hibernation roosts in buildings are recognised and considered of potential **District** and **Local** importance, respectively, due to the number and extent of features present.

8.4.172 In the absence of mitigation, the proposed construction works could:

- Kill or injure individual bats using bat roosts during the demolition/site clearance phase;
- Destroy at least six bat roosts;
- Disturb bats within roosts via noise and vibration during the construction phase (noting the CEMP will limit construction hours to 7:30am-5:30pm and not illuminate woodland and trees during the active flight period, avoiding the potential for works lighting disturbance effects);
- Cause the direct loss of foraging habitat and wider roosting resources;
- Remove or sever bat commuting routes potentially affecting the ability of bats to move through the landscape and access foraging habitats and wider roosts, resulting in the fragmentation and abandonment of roosts and or impairing survival;
- Have negative impacts to retained on-site or adjacent suitable habitat such as hedgerows through construction phase impacts including polluting events.

8.4.173 In the absence of mitigation direct loss of the known common pipistrelle day roost within Tree 68 would result in a **not significant** effect on bats, owing to the status of the roost and species. There is, however, a legal requirement for licensing to permit the removal of the roost to avoid contravention of wildlife legislation. Appropriate mitigation for roost loss would be provided as part of the licence, as required.

8.4.174 There are at least 111 trees on the Site with suitability for multiple roosting bats (PRF-M) and 54 with suitability for individual / small numbers of roosting bats (PRF-I). Many more groups of trees/ individual trees have not been surveyed, with likely bat roost supporting features. At least one PRF-I tree will need to be removed for the proposed Development which, with reference to guidelines, has not been surveyed for bats. As outlined in the Arboricultural

Impact Assessment (Appendix 8.16), there is also the potential for removal of wider PRF-I and PRF-M trees that could support summer and hibernation roosts, to be confirmed at the detailed design stage.

- 8.4.175 Data indicates the potential presence of roosting barbastelle in Westwick Row Woodland and possibly the woodland in the north-east of the Site. Trees in these woodlands will not be removed and therefore no killing or injury of bats is likely as a result.
- 8.4.176 In the absence of mitigation, the removal of trees could result in the killing or injuring of bats that would contravene wildlife legislation and potentially result in a **moderate adverse** effect which is **significant**. Mitigation measures are therefore proposed in Section 8.5.
- 8.4.177 With reference to the Demolition Testing Plan (provided at **ES Volume 2, Chapter 6 Figure 6.3**) Building B2 (Wood End Farm Cottages - supporting a common pipistrelle day roost), will be retained as it is a listed building. Building B6 (Wood End Farm - supporting a BLE day roost) will be mostly demolished/potentially demolished with the western portion only retained as a listed building and the farmstead buildings repurposed (see Land Use Parameter Plan). Building B18 (Westwick Row Farm - supporting BLE, common pipistrelle and soprano pipistrelle day roosts) will be mostly retained as a listed building though its north-easterly portion will potentially be demolished, and the farmstead buildings will be repurposed.
- 8.4.178 In the absence of mitigation, it is assumed that building refurbishment and/or demolition will result in roost obstruction, modification or loss. As roosts of individual/small numbers of common species bats, this would result in a **not significant** adverse effect. There is a legal requirement for licensing to permit the removal of these roosts which would otherwise contravene wildlife legislation and appropriate mitigation would need to be proposed as part of any licences. Like-for-like replacement will be required wherever possible and the provision for brown long-eared bats will need to be different to that for pipistrelles so that varied replacement roosting opportunities will be provided. The exact mitigation measures will be established as part of licensing and detailed designs. The loss of these roosts is therefore not considered further in this assessment.
- 8.4.179 The buildings containing summer roosts listed above and those with suitability for summer roosting bats (B1, B2, B3, B4, B6, B7, B8, B12, B18, B19, B20, B22, B24, and B27) were also confirmed to have non-classic hibernation potential and may therefore support individual/small numbers of winter roosting bats. Guidelines note the difficulty in surveying/confirming roost presence/likely absence in such contexts and recommend that low roost potential is assumed. In the absence of mitigation there is the potential for injury/mortality during demolition/refurbishment works. This is considered to potentially result in a **moderate adverse** effect which is **significant** and is further scoped in for legal compliance reasons. Mitigation measures are therefore proposed in Section 8.5.

Disturbance

- 8.4.180 Effects upon bats associated with LWS within the zone of influence of the Development during construction are considered in the relevant section above.

- 8.4.181 As embedded in the CEMP, works will be limited to Monday to Friday – 7:30am to 6:00pm; Saturdays – 8:00am to 1:00pm; and with No noisy works allowed on Sundays and Bank and Public Holidays. Start-up and close-down periods of up to an hour before and after core working hours (6:30am to 7:00pm Monday – Friday / 7:00am to 2:00pm Saturday) will be used for activities such as arrival of workforce and staff on-Site; deliveries and unloading; maintenance and checking of plant and machinery; general refuelling; site inspections, and safety checks prior to commencing work; site meetings; and general site clean-up and departure. Due to the restricted working hours, noise and lighting disturbance is considered unlikely to affect commuting or foraging bats.
- 8.4.182 There is the potential for disturbance to roosting bats within trees and buildings during day-time construction works including building demolitions, refurbishment and repurposing works and/or habitat modification resulting in roost abandonment or loss. This is considered a potentially **moderate adverse** effect which is **significant** and is further scoped in for legal compliance reasons. Mitigation measures are therefore proposed in Section 8.5.

Habitat Loss

- 8.4.183 The Site primarily comprises large open arable fields which are sub-optimal for foraging/commuting bats, and the loss of which would likely be of limited adverse impact upon bats. The hedgerows, tree lines and woodland interspersing these are considered to provide the majority of foraging and commuting value, as well as tree roosting resource with many categorised as PRF-I and PRF-M. Barbastelle, which are potentially roosting within Westwick Row Wood, and possibly within the woodland in the north-east of the Site, rely on a large number of trees due to their roost-switching behaviour: these tend to be within larger woodlands rather than in isolated trees or open woodland habitat.
- 8.4.184 Habitat loss and severance will occur during construction activities including habitat severance for infrastructure (including notably the STC and local roads, and potentially drainage), due to earth works associated with creation of the M1 noise bund and for ground levelling within the commercial areas, sports pitches and for development footprints of buildings, hardstanding and construction laydown and compounds. The design has looked to maximise the retention of higher value existing vegetation outside of the development parcels, wherever possible, providing connectivity across the Site, and the retained buildings are within areas with connected green infrastructure, outside of development parcels.
- 8.4.185 Assuming habitats within the development parcels and associated infrastructure, scrub and plantation areas along the M1, and wider hedgerows and trees (identified as potentially lost within the Arboricultural Impact Assessment (Appendix 8.16)) are lost, there would be a further notable reduction in habitat connectivity, foraging and tree roosting resources for some species. In the absence of any presumption of habitat retention within the development parcels then notable habitat connectivity of foraging resources would be lost. The STC will require severance of retained habitats and where the extent of severance and associated disturbance/degradation impacts are not minimised/avoided then greater severance effects would occur. Severance could remain throughout the construction period where required for access without the establishment of any mitigation.

8.4.186 There will likely be a time lag between habitats being lost and new habitats created and becoming established and of full value to bats. Where a staggered approach to habitat removal and/or a delay in the creation of new habitats occurs a reduction in available foraging, commuting and roosting habitat will result and remain in effect for longer.

8.4.187 In view of the above there is the potential for **major adverse** effects of **significance** upon the assemblage of bats at the Site. Mitigation measures are therefore proposed in Section 8.5.

Barn owl

8.4.188 A confirmed barn owl nest has been found within a tree (T141) within EH South. Previous surveys have identified a confirmed nest on-site within a treeline south of Westwick Row in EH South, and one off-site to the east of EH East.

8.4.189 There is suitable foraging habitat present (grassland) and a mix of other habitats providing commuting features and potential grassland edges or habitat for prey species (hedgerow, woodland and scrub) and for the purposes of the assessment is assumed to be Type 1 optimal habitat.

Habitat loss

8.4.190 Approximately 44.77ha of grassland is present on the Site and of value to hunting barn owl. Based on published figures, this could potentially support two pairs of barn owl. There will be a loss of grassland during the construction phase, particularly along and to the east of Green Lane (south of the A414 Breakspear Way) and to the east of the Site around the A414 Breakspear Way junction works and north of Westwick Row. A narrow strip alongside B487 Hemel Hempstead Road (Redbourn Road) and south of Cherrytree Farm will also likely be lost.

8.4.191 The majority of potential commuting features such as hedgerows and woodland edges will be retained, albeit breached in places by the STC and other development. There will be a temporary loss of scrub, grassland and plantation woodland to the new noise bund along the M1 motorway.

8.4.192 The nest sites within T141 and the tree line south of Westwick Row (EH South) will be retained, as will the nest site off-site to the east of EH East.

8.4.193 Should any potential nesting sites be lost during the construction phase, at least one replacement nest box for every potential nesting site will be provided to be set out in the CEMP. The replacement nest boxes will follow accepted designs such as those from the Barn Owl Trust⁹⁵, and be erected at least 30 days prior to works commencing or deployment of dissuasion measures (soft blocking the existing feature), at least 10m up and in a location which allows the entrance hole to be clearly seen. Nest boxes will be installed as far away from the M1 motorway and major roads, as possible.

8.4.194 Vegetation clearance and enabling works will be phased over at least a four-year period between 2027 and 2030 (and likely longer in areas not requiring enabling works) such that not all areas of foraging or commuting or habitat

⁹⁵ <https://www.barnowltrust.org.uk/barn-owl-nestbox/barn-owl-nestboxes/>

will be lost to barn owl simultaneously. This is likely to mean that some foraging and commuting activity will continue on Site alongside works in areas that are not disturbed, and areas of suitable habitat within the wider landscape are also potentially available, for example arable field margins, Woodwells Cemetery to the west, Gorhambury Estate, Bunker's Park and around features such as Marchmont Pond (although the carrying capacity of these areas to accommodate any displaced activity is not known).

- 8.4.195 It is considered that the loss of habitat on Site may result in the loss of up to one pair of birds in the short to medium term while construction is ongoing and before newly created habitats in the form of the Valley and Country Park and other greenspaces have established, but that this is reversible and significant only at the Site level. As a result, habitat loss for barn owl is considered **not significant**.

Killing or injury

- 8.4.196 During the construction phase, there is potential for the accidental killing and injury of any birds nesting or roosting within trees to be felled or buildings to be demolished. To avoid this, the CEMP will include standard avoidance measures, including a precautionary check of all suitable features prior to works; in the first instance this will be undertaken over winter whereby any suitable holes or cavities in features to be removed, will be checked for roosting (and potentially early/ late nesting birds) and, where absent, blocked up or destroyed at this time to render them unsuitable for subsequent use during the main breeding season in spring and summer. Where winter checks are not possible, then a pre-works check will be undertaken immediately prior to works during the main breeding season. Should evidence of barn owl be found at this time, then an appropriate buffer zone or stand-off of at least 50-100m will be put in place until such time that the nest is no longer active. Replacement nest boxes will be erected for any loss as per the above section.

- 8.4.197 Should night working be required on Site, there is a low risk of traffic collisions with on-site vehicles. To avoid this, the CEMP will stipulate a speed limit of 15mph. There are no other anticipated sources of mortality or injury during the construction phase.

- 8.4.198 As such, with the measures embedded within the CEMP, and in order to be sure of compliance with the Wildlife and Countryside Act 2918 (as amended), the effects of killing or injury of barn owl during the construction phase is considered to be negligible and **not significant**.

Disturbance

- 8.4.199 There are three known nest sites within the Zol of the construction works: one to the east of the M1 motorway and EH East, one within tree T141 in EH South and one within a tree within a tree line south of Westwick Row, also in EH South. All will be retained; however, in the absence of mitigation, there is potential for construction-related disturbance to this Schedule 1 species.

- 8.4.200 In order to be sure of compliance with the Wildlife and Countryside Act 2918 (as amended), the CEMP will detail the requirement for all potentially disturbing works in proximity to all known or potential nest sites to either be undertaken outside of the breeding season, within the breeding season but only following temporary exclusion

measures (see below) or, where this isn't possible, for a stand-off of at least 50-100m.⁹⁶ around any active nest site to be implemented.

- 8.4.201 Where potential nest sites exist, dissuasion measures may be used such as soft blocking outside of the main breeding season. Where used, a licenced ecologist will undertake a further check for nesting barn owl to make sure the measures have been successful. Should a nesting or roosting barn owl be identified during dissuasion measure deployment, works will stop, and the licenced ecologist will advise on appropriate measures.
- 8.4.202 Given the measures above, and the requirement to comply with the relevant legislation with respect to avoidance of disturbance to Schedule 1 birds, there will be no effect, which is **not significant**.

Breeding birds

- 8.4.203 The Site currently supports a breeding bird assemblage of local importance. The breeding bird assemblage recorded on site comprised mostly common and widespread species in typical densities. Many of the species present are widespread generalist species found in a diversity of habitats; however, there are a number of notable farmland specialists present and known or potentially breeding on Site. These include corn bunting, linnet, skylark, grey partridge and yellowhammer. Others are regarded as farmland generalists which typically use a wider range of habitats than the specialist farmland species but are nonetheless somewhat reliant on such habitats to thrive.

Habitat Loss

- 8.4.204 Habitats that will be lost, or partially lost, to the Development include arable crops, modified and other neutral grassland, scattered trees, line of trees, ponds, other broadleaved woodland, other mixed woodland, other coniferous woodland, hedgerows, mixed scrub, bramble scrub, and hawthorn scrub. The long-term loss of these habitats will remove nest sites and foraging opportunities for notable species on the Site, particularly ground nesting species and species which utilise scrub and hedgerow habitats.
- 8.4.205 The majority of habitat lost to the Development during the enabling and construction works will be arable farmland and associated margins. This is of particular value to in-field nesting species such as skylark, corn bunting, grey partridge, lapwing and potential yellow wagtail, and will result in a loss of nesting habitat as well as a foraging resource. A relatively small loss of grassland habitats within EH South, in what is currently used as horse paddocks, will also occur which has the potential to affect species such as yellow wagtail, starling, thrushes and others recorded on-Site.
- 8.4.206 Farmland hedgerows and areas of scrub may support species such as yellowhammer and linnet, as well as other more generalist species. The majority of hedgerows have been retained within the design of the Development; however, the absence of the associated arable farmland and change in the nature of the surrounding landscape may alter the composition of the assemblage of birds utilising them for breeding, favouring more generalist species adept at living in close proximity to humans, for example house sparrow, wren, dunnock and greenfinch. It is

⁹⁶ Goodship, N.M. and Furness, R.W., (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283.

anticipated that such species will continue to utilise retained hedgerows in the medium-term once construction disturbance has subsided to an acceptable level. Many of the species recorded on Site will also utilise trees for nesting purposes as well as foraging and roosting and there will also be tree loss during construction, particularly along the M1 motorway bund.

- 8.4.207 Unmitigated, the loss of arable farmland during the enabling and construction phase is predicted to result in the loss of an estimated 49 skylark territories as determined by territory analyses undertaken following the most recent suite of breeding bird surveys. This will be across the entire duration of the clearance phase which will be staggered over at least a four-year period. Much smaller losses of corn bunting, grey partridge, lapwing and yellow wagtail territories may also occur; these species will utilise open arable fields for nesting but were considered as possible breeders only on-Site during the last suite of surveys. The loss of arable margins will impact on a wider range of species that utilise these habitats for foraging.
- 8.4.208 Suitable habitat exists in the wider landscape to the north, south and east of the Site. Displacement of some birds from the Site may occur into these habitats as clearance and construction activities progress in a phased manner; however, it is not known if these habitats are already at carrying capacity and can accommodate additional breeding territories. Overall, construction activities will result in a net loss of suitable nesting opportunities for ground-nesting farmland birds.
- 8.4.209 Several species typically, or often, associated with buildings were recorded on-Site as probable or possible breeders. These include house sparrow, starling, swift and house martin. House sparrow were recorded close to Westwick Farm, which is to be mostly demolished, and swifts were recorded close to Wood End Farm and Wood End Cottages which will also be either demolished or repurposed. There is a risk in the absence of mitigation, therefore, that there will be a loss of nesting and roosting opportunities for these and other species that utilise buildings and structures.
- 8.4.210 In the absence of mitigation, habitat loss during the construction phase is considered to be negative at the Local level, in particular for red-listed and SPI species such as skylark and other farmland specialists, and to result in a **moderate adverse** effect which is **significant**. Mitigation measures are therefore proposed in Section 8.5.

Killing or injury

- 8.4.211 There is the potential for killing and injury of birds during the clearance of vegetation, felling of trees and demolition of buildings. This includes nesting but also roosting birds. As part of the CEMP, and to be sure of compliance with the relevant legislation, measures will be set out that restrict clearance of suitable habitats within the main bird breeding season (March to August inclusive). Due to shifting climate which appears to be extending the nesting season of birds, clearance in the shoulder months of February and September will only proceed following a precautionary pre-works check no more than 48 hours prior to clearance by a suitably experienced ecologist. Information on dealing with last minute discoveries will also be detailed.
- 8.4.212 Should the above timing not be possible, and clearance within the main bird breeding season is unavoidable, a pre-works survey will be conducted no more than 48 hours prior to clearance by a suitably experienced ecologist.

Where this includes arable farmland, a detailed site walkover will be required to check for ground-nesting birds such as skylark. Where this involves demolition or the felling of trees with cavities, this will involve a detailed inspection of any potentially suitable crevices, cavities and ledges for evidence of nesting.

8.4.213 Where active nests, or nests in the process of being built are found, or suspected, an appropriate buffer will be placed around the nest, within which no clearance will take place. This buffer will provide sufficient cover and connectivity to surrounding habitats to allow for continued use of the nest, and will remain in place until it has been confirmed by an ecologist that the nest is no longer active.

8.4.214 With the embedded mitigation in place, it is not anticipated that killing or injury or nesting (or roosting) birds will occur during the construction phase and this is therefore **not significant**.

Disturbance

8.4.215 As mentioned above, there is a risk that birds attempting to nest within retained habitats on Site will be disturbed by ongoing construction activities, particularly where these commence after nesting has begun. As part of embedded measures within the CEMP to protect retained hedgerows and trees, a buffer zone or stand-off will be in place which will reduce the likelihood or severity of disturbance. As part of the CEMP, lighting will also be avoided on retained habitat should night-time working be required.

8.4.216 While disturbance of nesting and foraging birds is unlikely to be avoided in its entirety, the above measures are anticipated to mitigate the effect such that it is unlikely to be evident at more than the site level, which is **not significant**.

Raptors

8.4.217 Targeted raptor surveys and the suite of breeding bird surveys within 2024 identified breeding behaviour of three notable raptors. Confirmed and potential nests for red kite were recorded, peregrine activity which was classified as possible breeding and kestrel activity recorded as probable breeding. Non-notable species recorded included buzzard.

Habitat loss (nest sites)

8.4.218 Red kite are a common resident breeding species in Hertfordshire with a roost of 70 birds observed near Hemel Hempstead in January 2023⁹⁷ (HNHS, 2024). This Schedule 1 species has been confirmed as breeding on-Site at Westwick Row Wood within EH South. The species has an historic breeding presence here and thus is likely to be of significance to the local population. This woodland will be retained in its entirety and no direct loss of nesting habitat in this area is proposed. A further confirmed nest site was found on-site to the north of Punchbowl Lane, east of Cherry Tree Lane and just south of EH North, and a potential nest site recorded to the east of Cherry Tree Lane, with no direct impacts to these areas. Other potential nest sites are present off-site, including two north of

⁹⁷ Hertfordshire Natural History Society (HNRS) (2024). The Hertfordshire Bird Report 2023. Transactions of the Hertfordshire Natural History Society, Volume 56 Part 1, November 2024.

Redbourn Road within the ZOI of the Works. No direct loss to these potential nest sites will occur as a result of the construction phase of the Development.

- 8.4.219 Peregrine was observed calling and in flight in EH North and EH Central. As pylons are potential nesting habitat, peregrine was assessed as a possible breeding species. No other suitable nesting habitat is present on the Site and the pylons are to be retained *in situ*. Peregrines are also afforded Schedule 1 status.
- 8.4.220 Territory analysis suggests a single kestrel territory on the Site with various observations of birds calling and in flight. A pair of kestrels and nest material being carried was observed during breeding bird surveys within EH South, close to Westwick Row Wood and Westwick Farm, which suggests breeding nearby. This is most likely within the woodland; however, in more urban areas, kestrels are known to utilise roof tops and holes in walls for nesting. The woodland will be retained; however, most of Westwick Farm buildings will be demolished with a potential loss of this nest site.
- 8.4.221 No evidence of long-eared owl was recorded during recent surveys, although previous surveys have observed foraging activity within EH South. Some potential for breeding on Site remains due to the highly secretive nature of this species. Long-eared owl typically nests in coniferous woodland, but it is possible that they could breed within mixed woodland on the Site. There will be no loss of this habitat. A deceased juvenile tawny owl was found at the base of a tree in EH North during breeding bird surveys which suggests this may have been a nest site. This tree will be retained.
- 8.4.222 Buzzards are known to have nested on site in the past and a potential site was identified during the 2024 surveys along Punchbowl Lane in the centre of the Site, which will be retained.
- 8.4.223 The loss of habitats used for nesting purposes is not considered likely therefore, with the possible exception of kestrel. Kestrel are an amber-listed species on account of their moderate breeding population decline over 25 years/ longer term⁹⁸; however, despite its decline since the mid-1970s, the kestrel remain breeding at high density in mixed farmland across much of England⁹⁹ and the potential loss of a nest site would result in a site-level effect only. As such, this is considered **not significant**. Direct loss of nest sites of other raptor species is not anticipated and is therefore **not significant**.

Habitat loss (foraging)

- 8.4.224 Arable field margins and areas of grassland and scrub provide hunting habitat for raptors and owls recorded on-site. The majority of this habitat is to be lost during the construction phase, although this will be in a phased manner across the Site. Similar suitable habitat exists within the wider landscape to the north, south and east, although the capacity of these areas to accommodate birds displaced from the Site is not known. Red kite are predominantly scavengers, often feeding on roadkill, and the loss of largely arable type habitats on-site will be of less consequence to this species. In the longer term, the provision of grassland and scrub habitats within the Country Park and Valley

⁹⁸ Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 747.

⁹⁹ [Kestrel | BTO](#)

Park and other green corridors throughout the Site will provide high quality replacement habitat for species such as kestrel, buzzard and owls, and effects are therefore only considered to be temporary in the short to medium term, and reversible once new habitats are established. As such, foraging habitat loss is negative at the site level only, with population level effects unlikely during the construction phase and is **not significant**.

Killing or injury

8.4.225 The risks of killing or injuring raptor species on Site is low; however, there is some potential during the clearance of trees with cavities or during building demolition. This risk is not limited to nesting birds but also roosting individuals. Due diligence will be exercised when undertaking such operations as set out in the CEMP and will include the restriction of clearance of suitable habitats within the breeding season and/ or following a precautionary pre-works check no more than 48 hours by a suitably experienced ecologist. Information on dealing with last minute discoveries will also be detailed.

8.4.226 Where active nests are found, or suspected, an appropriate buffer will be placed around the nest, within which no clearance will take place. This buffer will provide sufficient cover and connectivity to surrounding habitats to allow for continued use of the site and will remain in place until it has been confirmed by an ecologist that the nest is no longer active. Roost sites will not be destroyed whilst individuals are present.

8.4.227 With the embedded mitigation in place, it is not anticipated that killing or injury or nesting (or roosting) raptors will occur during the construction phase and this is therefore **not significant**.

Disturbance

8.4.228 Where construction activities occur in proximity to nest sites, there is the potential for disturbance which may extend beyond the boundaries of the Site itself. Two Schedule 1 raptor species have been identified as breeding or possibly breeding on-Site – these are the red kite and peregrine. Two red kite nests were also recorded off-site but within the potential disturbance radius of the Development (specifically works to Redbourn Road) approximately 270m north-west and 105m north-east of the red line boundary by FPCR. Although these were not found to be occupied in 2025, the potential for use in future years cannot be ruled out.

8.4.229 Precautionary measures will be set out within the CEMP and implemented during the construction phase to avoid any disturbance of Schedule 1 birds in order to be sure of compliance with the Wildlife and Countryside Act 1981 (as amended). This will include avoidance of potentially disturbing operations during the breeding season wherever possible and, where this is not possible, a precautionary walkover/ survey of the area, including previously known or potential nest sites, will be undertaken in advance of works with the installation of appropriately sized and clearly demarcated buffer zones or stand-offs around any active nests. No works with the potential to cause any level of disturbance would be undertaken within these stand-off areas until such time as the nest is no longer active, as confirmed by a suitably experienced ecologist. Stand-offs would be 150-300m for red kite, and 500-750m for peregrine¹⁰⁰. Should nests of other Schedule 1 species be found, for example, hobby

¹⁰⁰ Goodship, N.M. and Furness, R.W., (2022). *Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species*. NatureScot Research Report 1283.

or long-eared owl, then species-specific buffer zones would be established according to the above guidance. N.B. if it is not possible to maintain a stand-off of sufficient distance around the nest, then works will likely need to be constrained to outside the breeding season when the nest is not active.

8.4.230 As construction works progress in a phased manner across the Site, some displacement of diurnal hunting birds into the wider landscape may occur, particularly for species less tolerant of noise and human activity. As for habitat loss, whilst this may exert a negative effect on individuals in the short to medium term, it will be highly unlikely to result in a population level effect given the low numbers of birds present at the Site, and it will be reversible once construction is complete.

8.4.231 Disturbance effects on raptors during the construction phase is therefore considered **not significant**.

Wintering birds

Habitat loss

8.4.232 The wintering bird assemblage recorded during surveys comprised mostly common and widespread species, typical of the habitats present and in densities consistent with published information sources. Although the hedgerows on Site vary in quality and structure, they provided winter foraging and refuge for species associated with hedgerows including notable species on site, linnet, house sparrow and dunnoek. A peak count of 16 red kite was observed during surveys within EH South. Other notable birds observed during the surveys and described by the Hertfordshire Bird Club as autumn/winter visitors for Hertfordshire include common gull, herring gull, redshank, green sandpiper, woodcock, fieldfare and redwing.

8.4.233 Gulls were seldom seen during the surveys with low numbers of common gull observed loafing in arable fields in the north of EH South and in fields on the opposite side of the M1 motorway, and herring gull observed circling over fields on one occasion. Redshank, green sandpiper and woodcock were all observed singly suggesting the Site does not offer habitat of high significance for the species. Fieldfare and redwing were observed regularly with numbers in line with those recorded in the Hertfordshire Bird Report 2023 and with the majority of the birds seen foraging in hedgerows and ground feeding in fields. The M1 motorway buffer plantation was also noted as providing foraging resources for these wintering birds. Skylark were observed regularly and in good numbers in the south and east of the M1 motorway with conditions favourable in these locations due to the presence of winter stubble.

8.4.234 The majority of hedgerow and woodland habitat is to be retained throughout the Development and will be incorporated into the Country and Valley Park and green corridors. Birds utilising such habitats over winter will likely benefit from the proposals in the longer term and effects of the loss of small areas of hedgerow are unlikely to be significant. The loss of vegetation along the bund adjacent to the M1 motorway, which was observed to be used as foraging habitat for groups of wintering redwing and fieldfare, will have a temporary impact at the site level, but suitable habitat is present within the wider landscape and significant effects are not anticipated. Red kite are generalists and predominantly scavengers, often feeding on roadkill, and given the availability of surrounding habitat, the loss of habitat on Site is not considered significant.

8.4.235 The loss of arable field and margin habitat has the potential to adversely affect wintering skylark which were recorded in good numbers on the Site, as well as smaller numbers of other seed-eating farmland birds but such losses will be phased as the Development progresses and there is suitable habitat within the wider landscape to the north, south and east. It is not anticipated that effects would be evident at the local population level given the availability of habitat elsewhere and the species tendency to flock in winter; however, a site-level effect is likely during the construction phase.

8.4.236 As such, the effects of habitat loss on wintering birds during the construction phase are considered to be negative at the site level and is **not significant**.

Killing or injury

8.4.237 The risks of killing or injuring wintering species on Site is extremely low. It is theoretically possible that species such as house sparrow or starling may roost within eaves or other features on buildings that could be blocked up during conversion works or destroyed during demolition operations, but it is unlikely that birds would remain in situ whilst disturbing works are ongoing around them. As part of the CEMP, however, a pre-works inspection will be undertaken of such features immediately prior to removal in areas where there is considered to be a credible risk.

8.4.238 As such, it is not anticipated that killing or injury of wintering birds will occur during the construction phase and this is therefore **not significant**.

Disturbance

8.4.239 As construction works progress in a phased manner across the Site, some displacement of wintering birds from retained habitat or habitat yet to be cleared into the wider landscape may occur, particularly for species less tolerant of noise and human activity. This has the risk of increasing the energy expenditure of individuals at a time when conditions can be harsh and food resources scarce. However, owing to the availability of alternative, suitable habitat in the area, and the generally low numbers of birds observed to be using the Site over winter, this is highly unlikely to result in a population level effect. Disturbance effects on wintering birds during the construction phase is therefore considered **not significant**.

Summary of Significance of Effects During the Construction Phase

8.4.240 The assessment has concluded no significant effects on ecological receptors during the construction phase (in the absence of additional mitigation), apart from those shown in Table 8.9 below.

Table 8.9: Summary of significant effects on ecological receptors during the construction phase

Receptor	Significant effect(s)
HPI Hedgerows	Habitat loss – Significant (moderate adverse)
Bats	Habitat loss – Significant (major adverse)

Receptor	Significant effect(s)
	Fragmentation – Significant (major adverse)
	Killing or injury – Significant (major adverse)
	Disturbance – Significant (minor adverse)
Breeding bird assemblage	Habitat loss – Significant (moderate adverse)

The Completed and Operational Development

Embedded Mitigation Measures

8.4.241 As part of the requirements for Biodiversity Net Gain (BNG), there is a commitment to the long-term management and monitoring of habitats on the Site (those created as part of the BNG solution, including where these represent additionality to the SANG). As such, measures that would be required as part of the BNG Habitat Management and Monitoring Plan (HMMP) are considered embedded within the Development.

8.4.242 In the south of the Site the Valley Park connects to Westwick Row at four broad interfaces; Green Lane/Westwick Row to the north; in a broad swathe at Westwick Row Farm; South of Westwick Warren and in the far south of the site directly adjoining Hemel Hempstead Road. Further, connectivity to habitats on the far side of Hemel Hempstead Road (including Bunkers Park and Blackwater Wood) will be provided by connected green corridors including a broad swathe south of Westwick Cottage/Greenacres and adjacent to Westwick Row Wood. Wide green buffer habitats are further maintained bordering existing trees and hedgerow associated with Hemel Hempstead Road, Westwick Road and Green Lane.

8.4.243 Enhanced planting along the M1 throughout consists of the existing woodland belt and newly planted woodland trees that will help mitigate the noise and light from the M1 and will create a substantial area of woodland habitat providing a connective feature north to south (notwithstanding the existing A414 Breakspear Way) and linking into the network of green corridors which run east-west across the Site (notwithstanding the existing A414 Breakspear Way).

8.4.244 As part of the required mitigation licences for badgers and bats, post-development monitoring of mitigation and compensation measures, including habitat and sett creation, will be required to assess their efficacy and to remedy where necessary. As such, these are considered embedded within the Development.

Effects scoped into the assessment

8.4.245 As set out in the EIA Scoping Report and subsequent consultation responses the potential for the following likely significant effects to arise during the completed and operational development phase are considered:

- Increased pollution, traffic and recreational pressure on the Chiltern Beechwoods SAC, Ashridge Commons SSSI and other designated sites for nature conservation;

- Damage to habitats on and potentially off-site via increased pressure on greenspaces, including erosion, damage to vegetation, litter, vandalism and eutrophication from dog fouling;
- Effects on chalk streams from groundwater abstraction and pollution;
- Fragmentation of habitat for badger and bats by new roads and area of urban development; and
- Increased lighting, disturbance and pet predation and their associated harms to habitat and species.

Traffic modelling

8.4.246 Detailed traffic modelling using a cumulative scenario has been undertaken to establish whether estimated traffic levels on the road network around the Site during the operational phase are predicted to fall above the critical thresholds of ≥ 1000 vehicles or 200 Heavy Duty Vehicle (HDV) Average Annual Daily Traffic (AADT)^{101, 102} (see **ES Volume 2, Chapter 10 – Transport**). The following receptors fall within this operational affected road network (ARN) (**Table 8.10**) and sensitive habitats within these sites may therefore be subject to negative effects as a result of air quality changes. A detailed air quality assessment has been undertaken in relation to these receptors to determine whether changes are likely to be significant in the context of the integrity of the site and/or its ability to recover to a favourable conservation status (**ES Volume 2, Chapter 11 – Air Quality**).

8.4.247 There are a number of SSSI and an SAC (Chilterns Beechwoods SAC, Ashridge Commons & Woods SSSI, Tring Woodlands SSSI, Roughdown Common SSSI and Bricket Wood Common SSSI) that fall outside the operational ARN and as such, effects from the Development ‘alone’ can be screened out. Further consideration is given in the relevant sections and in Section 8.6 to the potential for cumulative effects from the Development alongside new developments in the wider area that may also generate traffic along the roads on which the SSSI/ SAC lie.

Table 8.10: Ecological receptors within the operational ARN

Receptor	Status	Main habitat
Westwick Row Wood	LWS & HPI	Old, possibly ancient semi-natural woodland
Nickey Way Dismantled Railway	LWS	Hedgerow, woodland, grassland mosaic
Disused Railway Line, Hemel Hempstead	LWS & HPI	Old secondary woodland
Potters Crouch Plantation	LWS	Plantation woodland containing ancient semi-natural woodland remnants
Holy Trinity Church, Leverstock Green	LWS	Old neutral grassland
Prae Wood	LWS & HPI	Ancient semi-natural woodland
Woodhall Wood	LWS, AWI, HPI	Ancient semi-natural woodland
Appspound Wood	LWS, AWI	Ancient replanted woodland

¹⁰¹ Natural England (2018) Natural England’s approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations.

¹⁰² IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites.

Receptor	Status	Main habitat
Widmore Wood	LWS, AWI, HPI	Ancient semi-natural woodland
Birch Wood (near Potters Crouch)	LWS, AWI	Ancient replanted woodland
Redbourn Common	LWS	Semi-improved and acidic grassland
Ver Valley (by Chequer Lane)	LWS	Grassland, fen, swamp, river valley
Long Spring (Potters Crouch)	LWS	Ancient woodland site with restorable elements
Park Wood (near Chiswell Green)	LWS, AWI	Ancient woodland
Yew Tree Wood	AWI, HPI	Ancient woodland
St Julians Wood	HPI	Lowland deciduous woodland
On-site woodland (EH North)	HPI	Lowland deciduous woodland
Woodland south of Redbourn, along B487	HPI	Lowland deciduous woodland
Woodland near Spencer’s Park play area	HPI	Lowland deciduous woodland
Woodland at Pratt’s Dell	HPI	Lowland deciduous woodland
Woodland at Marchmont Pond	HPI	Lowland deciduous woodland
Woodland adjacent to Madam’s Wood	HPI	Lowland deciduous woodland
Woodland opposite St Julian’s Wood	HPI	Lowland deciduous woodland

Statutory Designated Sites

Chilterns Beechwoods SAC

8.4.248 Information required by the competent authority in respect of Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended) is presented in the shadow HRA (**ES Volume 3, Appendix 8.13**). Two impact pathways were identified for the operational phase of the Development; namely air quality (from increased road traffic emissions on roads passing within 200m of the SAC component SSSI) and recreational disturbance from an increase in visitors to the SAC.

Air Quality

8.4.249 The results of traffic modelling have been used to inform the assessment on whether likely traffic flows past the SAC will trigger the need for further analysis, in particular, an air quality assessment in line with the guidance set out in IAQM (2020) and the Design Manual for Roads and Bridges (DMRB 2019). This used traffic modelling predictions for the year 2044 to represent the Development when it is fully operational, traffic during the operational phase on the local road network present a cumulative scenario alongside traffic growth from other

plans and projects including local plan development as well as those committed developments set out in **ES Volume 2 – Chapter 2** and so represents a cumulative assessment. Air quality effects were considered unlikely from the Development in isolation or in-combination with the developments within the traffic model.

8.4.250 A review was also undertaken for live (including pre-app) plans or projects constituting at least 100 residential dwellings within 5km of the SAC at Tring Woodlands SSSI that were not considered as part of the traffic modelling exercise. This was to help assess whether there was any further scope for in-combination effects on air quality as a result of these wider developments.

8.4.251 The HRA concluded that there is unlikely to be a significant effect on Chilterns Beechwoods SAC as a result of air quality impacts from the Development in combination with other plans or projects. This is therefore considered to be **not significant**.

Recreational pressure

8.4.252 The Development will result in an increase in residents, who may travel to the Chilterns Beechwoods SAC for recreation, resulting in a potential increase in visitor pressure.

8.4.253 The provision of the Country Park and Valley Park as Suitable Alternative Green Space (SANG) as embedded in the design of the Development is specifically aimed at mitigating the above effects of increased recreational pressures on the SAC and are required under planning policy. They have been designed with reference to the latest Natural England guidance¹⁰³. As concluded in the HRA, operational phase effects on the SAC in relation to recreational disturbance is therefore considered to be **not significant**.

Roughdown Common SSSI

8.4.254 This chalk grassland SSSI is located 4.2km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the mainline railway, and the River Gade corridor. Potential impact pathways on the SSSI during the operational phase are in relation to air quality and increased recreational disturbance. The position of the SSSI adjacent to the A41 renders it vulnerable to the adverse effects of air pollution should traffic increase significantly during the operational phase. Calcareous grassland habitats are sensitive to changes in air quality and typical effects can include a reduction in species richness and/ or species diversity/ changes species composition, the loss of rare or endangered species and calcicolous mosses and lichens, and changes to soil chemistry.

8.4.255 Traffic modelling using a cumulative scenario on the A414 near Two Waters Way which provides access onto the A41 c. 400m to the east of the SSSI, has indicated that the AADT thresholds will not be exceeded (**ES Volume 2 Chapter 10 – Transport**). As the SSSI lies further from the Site than these link locations it is unlikely that the A41 adjacent to the SSSI will experience greater traffic flow from the Development and as such, adverse effects on the sensitive habitats within the SSSI are not anticipated from the Development generated traffic alone and cumulatively with those developments within the traffic modelling and are therefore **not significant**.

¹⁰³ Natural England (2021) Guidelines for Creation of Suitable Alternative Natural Greenspace (SANG) – August 2021.

8.4.256 The SSSI is publicly accessible with access from footpaths starting at the junction of Roughdown Road and Roughdown Avenue. An explanatory panel, placed by the Box Moor Trust who manage the site, stands by the quarry entrance near the Roughdown Avenue railway bridge. It is used regularly by dog walkers and benches are present. There is no dedicated car parking for the site, although parking is possible on some nearby roads. A Management Plan¹⁰⁴ for the site details the objectives for habitat management in line with Natural England's Conservation Objectives for the site, although this does not appear to include visitor management.

8.4.257 Habitats within the SSSI are sensitive to recreational pressure, in particular from trampling, erosion and nutrient enrichment of soils from dog fouling. The bat hibernation roost within the ex-chalk mine is also potentially subject to disturbance from visitors, particularly over the winter months; however, this has a caged entrance and so direct access is not possible.

8.4.258 At over 4km away, it is feasible that residents of the Development will travel to the Common for recreational purposes and that the SSSI will experience increased visitor numbers during the operational phase; however, it is not readily walkable directly from the Site which will likely deter some from making a specific trip. Given the visitor and habitat management already in place at the site, and the on-site mitigation embedded within the Development in the form of the Country Park and Valley Park it is considered that any increase in visitor numbers would not result in a noticeable effect on the interest features of the SSSI. As a result, the effects of recreational pressure on Roughdown Common SSSI are **not significant**.

Bricket Wood Common SSSI

8.4.259 The SSSI is located 4.7km to the south of the Site on the opposite side of the M1 motorway and within the M25 east of Abbots Langley and North Watford. Potential impact pathways on the SSSI during the operational phase are in relation to air quality and increased recreational disturbance.

8.4.260 At its closest point (Mutchetts Wood – Unit 4), it lies within 75m of the M1 motorway, but the vast majority (98.19%) of this 70ha site is well over 200m from the M1 motorway. It is possible that the M1 motorway at this point could see higher than baseline traffic movements during the operational phase, and that levels of pollutants increase on the SSSI unit. Broadleaved woodland habitats such as those present on the unit are sensitive to emissions, with typical effects being increased risk of drought stress and uprooting, crown discoloration, changes in mycorrhizal flora and reduction in the numbers of large sporocarps, fruiting bodies, increased defoliation by leaf feeders; a loss of understory species diversity and lichens, adverse effects on epiphytic growth on oaks, and changes to soil chemistry and fauna.

8.4.261 Traffic modelling using a cumulative scenario with committed development within the Hemel Hempstead area has indicated that the AADT threshold will not be exceeded on the M1 south of Hemel Hempstead. In addition, only a very small proportion of the SSSI falls within 200m of the M1 (c. 1.81%) and the habitat in this zone consists of a mosaic of secondary woodland with a very dense structure caused by self-set young oaks, rather than high forest

¹⁰⁴ [Roughdown-Common-Management-Plan.pdf](#)

ancient woodland.¹⁰⁵ As such it is highly unlikely that there will be a significant effect on sensitive woodland habitats sufficient to affect the integrity of the SSSI. This is therefore assessed as **not significant**, both in isolation but also, potentially in combination with other developments in the wider area that may increase traffic load on the M1.

8.4.262 The SSSI is publicly accessible, having an amenity function for local people. It provides an important resource for small scale, informal recreation: walking and dog walking on the public footpaths and other tracks; horse riding and cycling on the public bridleways. It lies within 400m of Bricket Wood railway station and 1km from Garston railway station. A regular bus service also operates, stopping at Bricket Wood and the common has links to the wider countryside, particularly through the Ver Valley. Promoted routes like the Hertfordshire Way, the Ver Valley Walks, the Abbey Line Trail and a St Stephen Parish Walk all link up with, or pass through, the common. The infrastructure of roads and car parking around Bricket Wood Common is limited and the three vehicle entrances at Bucknalls Lane, Mount Pleasant Lane and School Lane, are protected with lockable bollards. The common is registered as Access Land which allows the public the right to walk freely there without having to stay on paths. A total of 670m of bridleway have been improved by the installation of hard surfacing and bridges with routes suitable for buggies or mobility vehicles. There are some short stretches of boardwalk, but away from these main paths, all other path surfaces are natural and can be muddy, especially during the winter.

8.4.263 Habitats within the SSSI are sensitive to recreational pressure, in particular from trampling, removal of deadwood, vandalism, fire, litter and nutrient enrichment of soils from fog fouling. A 10 year Green Spaces Action Plan.¹⁰⁶ sets out how the common will be developed to allow a co-ordinated and organised approach to management and conservation. Two interpretation boards are present at the site with information about the ecology of the site and an interpretation leaflet with a suggested walking route is available. Waymarks and small footbridges have been installed to guide visitors around the suggested walking route.

8.4.264 At over 4km away, it is feasible that residents of the Development will travel to the Common for recreational purposes and that the SSSI will experience increased visitor numbers during the operational phase; however, it is not walkable directly from the Site and would require transport, either public or by private vehicle which will likely deter some from making a specific trip. Given the visitor and habitat management already in place at the site, and the on-site mitigation embedded within the Development in the form of the Country Park and Valley Park it is considered that any increase in visitor numbers would not result in a noticeable effect on the interest features of the SSSI. As a result, the effects of recreational pressure on Bricket Wood Common SSSI are **not significant**.

Ashridge Commons and Woods SSSI

8.4.265 The SSSI, which underpins Chilterns Beechwoods SAC, is located 7.8km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the River Gade corridor, farmland and small areas of woodland.

¹⁰⁵ <https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1004687>

¹⁰⁶ [Bricketwood Common GAP 2017-22 Site Specific Plan Draft](#)

Potential impact pathways on the SSSI during the operational phase are in relation to air quality and increased recreational disturbance.

Air quality

- 8.4.266 Ashridge Commons and Woods SSSI lies adjacent to the B4506. An increased use of this road by residents of and visitors to the Development during the operational phase may lead to air quality impacts on the interest features of the SSSI. The beech woodland and grassland habitats present within the SSSI are sensitive to such pollutants and an exceedance of critical levels can modify the chemical status of its substrate, accelerating or damaging plant growth, altering its vegetation structure and composition and causing the loss of sensitive typical species associated with it.
- 8.4.267 Despite its proximity to the B4506, the SSSI is, as of 2022 (the date it was last assessed) in favourable condition.¹⁰⁷ and air quality is not flagged in the SSSI condition assessment, Views about Management (VAM) or Operations requiring Natural England Consent (ORNEC) documents as a concern (although maintaining the concentrations and deposition of air pollutants below the site-relevant Critical Load or Levels is a target within the SACO for the Chilterns Beechwoods SAC.¹⁰⁸
- 8.4.268 Traffic modelling on roads that are likely to be used to access the SSSI from the Development (A4251 west of Box Lane, near Winkwell, Piccotts End Road (north of Link Road) and the B440 Leighton Buzzard Road) suggest that even when combined, the AADT threshold is not exceeded (at 506 LDV and 34 HDV) and therefore that air quality effects are unlikely from the Development 'alone' and cumulatively with the committed Hemel Hempstead development included within the traffic model, and this is therefore **not significant**. Significant effects in combination with wider developments not included within the traffic model are also deemed unlikely based on the nature of the road passing through the SSSI and the lack of primary destinations served by it, the conclusions of individual project-level HRA and air quality assessment and the HRA of the relevant Local Plans (see 8.4.254-8.4.264 above and **ES Volume 3, Appendix 8.13**).

Recreational disturbance

- 8.4.269 The SSSI is almost entirely publicly accessible; only the northern part of Ashridge Commons and Woods SSSI (Ringshall Coppice) has no public access. There are many free car parks around the Ashridge Estate; it is estimated that there are c. 30 parking locations (504 parking spaces) at Ashridge Commons and Woods SSSI.¹⁰⁹ There are various waymarked walking, cycling and horse-riding routes around the site, several of them suitable for buggies and wheelchairs, and a café, visitors centre and toilets are also present at the National Trust car park near Aldbury.
- 8.4.270 Habitats within the SSSI are sensitive to recreational pressure. In the report commissioned to inform Dacorum Borough Council's emerging Local Plan, recreational impacts were observed throughout Ashridge and were severe in some areas. They were particularly intense in the central areas north and south of Monument Drive (e.g. Aldbury

¹⁰⁷ <https://designatedsites.naturalengland.org.uk/SiteFeatureCondition.aspx?SiteCode=S1001729&SiteName=Roughdown%20Common%20SSSI>

¹⁰⁸ Natural England (2018) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features. Chilterns Beechwoods Special Area of Conservation (SAC) Site Code: UK0012724. <https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0012724.pdf>

¹⁰⁹ Footprint Ecology Report - March 2022 (Low resolution)

Common and Old Copse, and Pitstone Common up towards Flat Isley) and also Northchurch Common. Just under 500 incidences of recreational damage were recorded. Damage through trampling was the most widespread impact, with widened paths and widespread incidence of bare compacted and sometimes churned ground with some path junctions now supporting extensive areas of poached ground. In many areas, but particularly the narrower desire lines through wooded areas, trampling had resulted in the exposure of tree roots (including those of veteran trees) and damage to tree roots. Other issues included widespread den building and damage from bikes wherever there was topographical variation. Eutrophication from dog fouling was widespread and a number of campfires/barbeque remains were noted.¹¹⁰

8.4.271 The Ashridge Estate, with its extensive habitat and visitor infrastructure, is a major draw for the public seeking recreational opportunities in the area. It is highly likely that, in the absence of any targeted mitigation, the SSSI would experience increased visitor numbers during the operational phase. However, given the on-site mitigation embedded within the Development in the form of the Country Park and Valley Park it is considered that any increase in visitor numbers would not result in a noticeable effect on the interest features of the SSSI. As a result, the effects of recreational pressure on Ashridge Commons and Woods SSSI are **not significant**.

Tring Woodlands SSSI

8.4.272 The SSSI, which underpins Chilterns Beechwoods SAC, is located 16.4km to the west of the Site with intervening land use comprising the town of Hemel Hempstead, the River Gade corridor, farmland and small areas of woodland. Potential impact pathways on the SSSI during the operational phase are in relation to air quality only owing to the SSSI's proximity adjacent to the A41.

8.4.273 Traffic modelling on roads that are likely used to access the SSSI from the Development (A4251 west of Box Lane, near Winkwell and Two Waters Way south of the A4251) suggest that even when counts from different link locations that may be used to access roads past the SSSI are combined, the AADT threshold is not exceeded (349 LDV and 57 HDV) and therefore that air quality effects are unlikely from the Development 'alone' and in combination with committed development within the Hemel Hempstead area. This is therefore **not significant**. Significant effects in combination with wider developments not included within the traffic model are also deemed unlikely based on the lack of primary destinations in this direction and the typical commuting distance to work for residents from the Development, and the conclusions of individual project-level HRA and air quality assessment and the HRA of the relevant Local Plans (see 8.4.254-8.4.264 above and **ES Volume 3, Appendix 8.13**).

Non-Statutory Designated Nature Conservation Sites

Westwick Row Wood LWS

8.4.274 Lying within the Site boundaries, potential impact pathways on the LWS during the operational phase are in relation to air quality, increased recreational disturbance, and lighting (covered elsewhere in relation to species on-site). The woodland lies at the same or higher elevation as the surrounding Site and therefore surface water

¹¹⁰ Footprint Ecology Report - March 2022 (Low resolution)

runoff from an increase area of impermeable surfaces and any concomitant contamination of soils from pollutants are considered unlikely. The site lies within 150m of the A4147 Hemel Hempstead Road and adjacent to Westwick Row (road). At this distance, it is possible that air quality could be affected by any significant increase in the use of the roads during the operational phase which may cause negative effects on sensitive woodland habitats.

8.4.275 Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). This concluded that the calculated maximum Process Contribution (PC) for the Development does not exceed 1% of the critical load (Ndep) and therefore that air quality impacts on the site can be considered **not significant**.

8.4.276 The LWS will be retained on site, likely within a residential area. In the absence of mitigation, there is the potential for adverse effects on the habitats within the LWS from public access and disturbance or urban effects – these might include damage and destruction of trees and woodland ground flora, including bluebells and other indicator species, though vandalism, uprooting, litter, soil erosion, wildfire and activities such as den building, tree climbing, biking and rope swings. There is also the potential for the introduction of invasive non-native species of plant from adjacent gardens or from the dumping of garden cuttings and arisings which may alter the composition of the ground flora. Nutrient enrichment of soils from garden waste and dog fouling may also affect species composition.

8.4.277 Such effects on the ground flora and understorey are potentially reversible with appropriate remedial management and retention of the seed bank, but success is not guaranteed, and the effects of damage and destruction of potentially ancient features is likely to be long-term. As such, in the absence of mitigation, the negative effect of recreational pressures on the LWS are considered to be **moderate adverse, significant** at the **local level**.

8.4.278 Baseline light levels at the wood are 0 lux. Whilst the LWS is not designated for species, artificial lighting on Site nonetheless has the potential to affect nocturnal wildlife (e.g., badgers, bats, and owls) using it for foraging and commuting purposes. Westwick Row, which runs along the northern boundary of the woodland, will be designated an HGC Circular (Green Loop) – Pedestrian and Cyclist Priority with Restricted Vehicle Access which will help limit potential light spill from vehicles and the remaining scope for effects of lighting (e.g., from street and path lighting) on these species is covered in the relevant species sections, and also within the Additional Mitigation section below.

Nicky Way Dismantled Railway LWS

8.4.279 The majority of the LWS that falls within the Site boundaries is to be retained and incorporated within the Country Park. The STC through the Development will cross the Nickey Line through a narrowed corridor to reduce construction phase impacts through habitat loss, damage and fragmentation. Potential impact pathways during the operational phase are in relation to air quality, increased recreational disturbance, traffic disturbance and vehicular collision risks, surface water runoff (and contamination) and lighting (covered elsewhere in relation to species on-site).

- 8.4.280 The LWS lies within 155m of the B487 Hemel Hempstead Road (Redbourn Road) which will receive additional traffic. At this distance, it is possible that air quality and thus habitats within the LWS could be negatively affected by emissions. In addition, traffic utilising the STC road will also be a contributory factor.
- 8.4.281 Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to exceed 1% of the critical load (Ndep); however, this fell below the 1% threshold when using the more realistic and robust scenario with an emissions factor year of 2035 combined with traffic data for the year 2044. As such, air quality impacts on this site can be considered **not significant**.
- 8.4.282 In the absence of mitigation, there is the potential for adverse effects on the habitats within the LWS from increased public access and urban effects – these might include damage and destruction of hedgerows, trees, ground flora and grassland through vandalism, uprooting, soil erosion, litter, wildfire and activities such as den building, tree climbing, biking and rope swings. Nutrient enrichment of soils from dog fouling may also affect species composition. Extensive damage has the potential to affect the function of the linear feature as a habitat corridor through the landscape.
- 8.4.283 Such effects are potentially reversible with appropriate remedial management and retention of the seed bank, but success is not guaranteed, and the effect of extensive damage is likely to be long-term. As such, the negative effect of recreational pressures on the LWS are considered to be **moderate adverse, significant** at the **local level**.
- 8.4.284 Habitat severance and traffic associated with the STC have the potential to disturb species associated with the Nickey Line LWS including bats, birds, mammals and invertebrates. This could deter use and dispersal and lead to injury/mortalities. This is discussed separately in relation to species of value. Effects on terrestrial species in general (e.g. small mammals) will be addressed through the incorporation of ‘habitat connectivity’ features, (e.g. 600mm badger tunnel) as embedded in the design at this location. This is therefore considered to be a minor adverse effect but **not significant**.
- 8.4.285 The Nickey Line lies within a dry valley at a lower elevation to the Site to the north and south. There is a 1 in 30 chance of surface water flooding each year in places along the feature.¹¹¹ With an increase in the area of impermeable surfaces across the Site (e.g., to buildings, hard standing and roads), there is the potential for an increase in surface water runoff which may lead to localised flooding events and, possibly contamination of soils from oil, fuel and other chemicals. As part of the Development, the proposed drainage strategy for the EH North (**ES Volume 3, Appendix 14.1**) includes a series of multi-value SuDS ponds with control chambers and hydrobrakes to connect to the existing Thames Water surface water sewer. The storage required by the SuDS has been determined such that greenfield runoff rates and volumes will be achieved, and as agreed with the Lead Local Flood Authorities and in line with Hertfordshire County Council’s Local Flood Risk Management Strategy 2 Policy 14.¹¹² As a result, an increase in surface water flood events is not anticipated.

¹¹¹ [Map – Flood map for planning – GOV.UK](#)

¹¹² [Local Flood Risk Management Strategy \(LFRMS\) 2](#)

8.4.286 With the above measures embedded within the Development, it is considered that there will be no noticeable effects on the Nickey Way Dismantled Railway LWS during the operational phase from surface water runoff or contamination of soils and is therefore **not significant**.

8.4.287 Baseline light levels on the Nickey Line within the Site are 0 lux. Whilst the LWS is not designated for species, artificial lighting on-Site nonetheless has the potential to affect nocturnal wildlife (e.g., badgers, bats, and owls) using it for foraging and commuting purposes. The effects of lighting on these species are covered in the relevant species sections, and also within the Additional Mitigation section below.

Disused Railway Line, Hemel Hempstead LWS

8.4.288 Potential impact pathways during the operational phase are in relation to air quality, increased recreational disturbance, surface water runoff (and contamination) and lighting (covered elsewhere in relation to species on-site).

8.4.289 The site lies within 100m of the B487 Hemel Hempstead Road (Redbourn Road). Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS for which a significant proportion falls within 200m of the B487 Redbourn Road and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to not exceed 1% of the critical load (Ndep). As such, air quality impacts on this site can be considered **not significant**.

8.4.290 In the absence of mitigation, there is the potential for adverse effects on the habitats within the LWS from public access and urban effects – these might include damage and destruction of hedgerows, trees, ground flora and grassland through vandalism, uprooting, soil erosion, litter, wildfire and activities such as den building, tree climbing, biking and rope swings. Nutrient enrichment of soils from dog fouling and trampling of vegetation may also affect species composition. Extensive damage has the potential to affect the function of the linear feature as a habitat corridor through the landscape.

8.4.291 Such effects are potentially reversible with appropriate remedial management and retention of the seed bank, but success is not guaranteed, and the effects of extensive damage is likely to be long-term. As such, the negative effect of recreational pressures on the LWS are considered to be **moderate adverse, significant** at the **local level**.

8.4.292 The LWS lies at a higher elevation than the Site.¹¹³ making potential effects from any increased surface water runoff unlikely, particularly given the presence of Cherry Tree Lane between the Site and the habitats of the LWS. The proposed drainage strategy for the Site will also facilitate no increase in surface water flood events.

8.4.293 With the above measures embedded within the proposals, it is considered that there will be no noticeable effects on the Disused Railway, Hemel Hempstead LWS during the operational phase from surface water runoff or contamination of soils and is therefore **not significant**.

¹¹³ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

8.4.294 Whilst the LWS is not designated for species, artificial lighting on Site nonetheless has the potential to affect nocturnal wildlife (e.g., badgers, bats and owls) using it for foraging and commuting purposes should it spill onto the LWS. The effects of lighting on these species are covered in the relevant species sections, and also within the Additional Mitigation section below.

Blackwater Wood LWS

8.4.295 Potential impact pathways during the operational phase are in relation to increased recreational disturbance, surface water runoff (and contamination) and lighting (covered elsewhere in relation to species on-site). It lies over 200m of major roads and therefore air quality effects from increased traffic during the operational phase are scoped out as **not significant**.

8.4.296 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – these might include damage and destruction of hedgerows, trees, ground flora and grassland through vandalism, uprooting, litter, wildfire and activities such as den building, tree climbing, biking and rope swings. Nutrient enrichment of soils from dog fouling and trampling of vegetation may also affect species composition. The woodland is accessible via a path which runs alongside the southern boundary between Bedmond Road and the A4147 Hemel Hempstead Road. Parking for a small number of cars is available on Bedmond Road.

8.4.297 However, given the opportunities for recreational activities that will be present on the Site itself in the form of the nearby Valley Park, and Country Park within EH North, it is unlikely that significant numbers of residents will visit Blackwater Wood on a regular basis and any impacts are likely to be minor. As such, the negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

8.4.298 The LWS lies at a higher elevation than the Site.¹¹⁴ making potential effects from any increase in surface water runoff unlikely. The proposed drainage strategy for the Site will also facilitate no increase in surface water flood events. It is therefore considered that there will be no noticeable effects on Blackwater Wood LWS during the operational phase from surface water runoff or contamination of soils and is therefore **not significant**.

Westwick Hall LWS

8.4.299 Potential impact pathways during the operational phase are in relation to increased public disturbance to bats within the LWS and effects of artificial lighting on the Site.

8.4.300 The LWS lies c. 280m east of the Site on the opposite side of the M1 motorway and A414, near the Gorhambury Estate. Westwick Hall is not open to the public and no public rights of way pass close to the site. Given the distance and lack of access, direct disturbance of bats within the roost site by the public is considered unlikely and is therefore scoped out as **not significant**.

8.4.301 As outlined within the likely effects assessment relating to the Works phase, it is unlikely that bats from this LWS rely on the Site as a resource of supporting habitat. Enhancements to habitats and the creation of new multi-value

¹¹⁴ <https://en-gb.topographic-map.com/map-cgt/United-Kingdom/?zoom=15¢er=51.74295%2C-0.4186>

SuDS with permanent water in East EH, provide potential additional foraging habitat. In the absence of mitigation, the effect on Westwick Hall LWS during the operational phase is likely to be negligible and scoped out as **not significant**.

Potters Crouch Plantation LWS

8.4.302 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance. At 290m from the Site and given the intervening land use, potential effects from any increase in surface water runoff or artificial lighting are also scoped out as **not significant**.

8.4.303 Only a small proportion of the LWS on the eastern side falls within 200m of the M1, although this does include part of Little Furze Field Wood which is an ancient woodland remnant and area of HPI deciduous woodland. Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to exceed 1% of the lower critical load (Ndep); however, this fell below the 1% threshold when using the more realistic and robust scenario with an emissions factor year of 2035 combined with traffic data for the year 2044. As such, air quality impacts on this site can be considered to be **not significant**.

8.4.304 In the absence of mitigation, there is the potential for adverse effects on the habitats within the LWS from public access and disturbance – these might include damage and destruction of hedgerows, trees, ground flora and grassland through vandalism, uprooting, litter, wildfire and activities such as den building, tree climbing, biking and rope swings. Nutrient enrichment of soils from dog fouling and trampling of vegetation may also affect species composition. The woodland is easily accessible via paths off Bedmond Road and from the golf course. Parking for a small number of cars is available on Bedmond Road at the entrance to one of the paths that traverse the site.

8.4.305 However, given the opportunities for recreational activities that will be present on the Site itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit Potters Crouch Plantation LWS on a regular basis and any impacts are likely to be minor. As such, the negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

Holy Trinity Church, Leverstock Green LWS

8.4.306 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance. At 330m from the Site and given the intervening land use, potential effects from any increase in surface water runoff is scoped out as **not significant**.

8.4.307 This LWS lies, in its entirety, adjacent to the south side of A4147 Hemel Hempstead Road at Leverstock Green. At this distance, it is possible that air quality could be affected by any significant increase in the use of the road by traffic from the Development which may cause negative effects on sensitive neutral grassland habitats.

8.4.308 Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary

calculated maximum PC was found to not exceed 1% of the critical load (Ndep). As such, air quality impacts on this site can be considered **not significant**.

8.4.309 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – these might include trampling of grassland and ground flora and potentially localised nutrient enrichment of soils from dog fouling. Such effects are potentially reversible with appropriate remedial management and retention of the seed bank, but success is not guaranteed. The churchyard is publicly accessible with parking for a small number of cars along Church Road, and possibly on surrounding local roads and the adjacent Leverstock Green cricket club; however, the site is not anticipated to present a major draw to residents of the Development given the nature of the site and the presence of the Country Park and Valley Park on-site. As such, any negative effects of recreational pressure on the LWS are considered to be at the site level only, which is **not significant**.

Kettlewell's Farm Area LWS

8.4.310 Potential impact pathways during the operational phase are in relation to increased public disturbance to bats within the LWS and effects of artificial lighting on the Site.

8.4.311 The LWS lies c. 530m east of the Site on the opposite side of the M1 motorway, south of Hogg End Lane, and c. 240m north-west of Windmillhill Wood and Adjoining Woodland LWS and the Gorhambury Estate. There are footpaths that pass through Kettlewell's Farm which link with the Site via Hogg End Lane; however, given that the majority of the farm area and buildings are in private ownership, it is unlikely that features within it would be subject to significantly higher levels of disturbance from residents of the Development. Direct disturbance of bats within the LWS by the public is considered unlikely and is therefore **not significant**.

8.4.312 As outlined within the likely effects assessment relating to the Works phase, it is unlikely that bats from this LWS rely on the Site as a resource of supporting habitat. Enhancements to habitats and the creation of new multi-value SuDS with permanent water in East EH provide potential additional foraging habitat. In the absence of mitigation, the effect on this LWS during the operational phase is likely to be negligible and is scoped out as **not significant**.

High Wood (Hemel Hempstead) LWS

8.4.313 Potential impact pathways during the operational phase are in relation to air quality and increased recreational disturbance. Traffic modelling has indicated that this site does not fall within 200m of the operational ARN and as such, air quality effects on High Wood (Hemel Hempstead) LWS during the operational phase are unlikely and **not significant**.

8.4.314 The woodland is accessible via a path on the northern side of the wood and therefore there is some potential for adverse effects on the habitats within the LWS from increased public access and disturbance – these might include damage and destruction of hedgerows, trees, ground flora and grassland through vandalism, uprooting, litter, wildfire and activities such as den building, tree climbing, biking and rope swings. Nutrient enrichment of soils from dog fouling and trampling of vegetation may also affect species composition. However, the LWS is unlikely to present a major draw to residents, particularly given the presence of the opportunities for recreation on site in the

form of the Country Park and Valley Park. As such, any negative effect of increased recreational disturbance on the LWS is considered to be at the site level only which is **not significant**.

Prae Wood LWS

8.4.315 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.

8.4.316 The woodland lies adjacent to or within 200m of the A4147 Hemel Hempstead Road, along c. 1.7km of its southern border, the majority of which is ancient, replanted woodland. Traffic modelling has indicated that the AADT threshold will be exceeded. And thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to exceed 1% of the lower critical load (Ndep); however, this fell below the 1% threshold when using the more realistic and robust scenario with an emissions factor year of 2035 combined with traffic data for the year 2044. As such, air quality impacts on this site can be considered to be negative but **not significant**.

8.4.317 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – there are a number of tracks through the woodland; however, these do not appear to be publicly accessible and there is no formal parking or facilities for visitors nearby. Given the opportunities for recreational activities that will be present on the Site itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit Prae Wood on a regular basis, should access be possible, and any impacts are likely to be minor. As such, any negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

Woodhall Wood LWS

8.4.318 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.

8.4.319 The ancient woodland site (with HPI deciduous woodland) lies c. 130m to the north of the B487 Hemel Hempstead Road (Redbourn Road). Approximately half of the LWS falls within 200m of the road. Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to not exceed 1% of the critical load (Ndep). As such, air quality impacts on this site can be considered **not significant**.

8.4.320 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – the woodland is easily accessible via a footpath that runs through the woodland from the B487 Hemel Hempstead Road (Redbourn Road) roundabout with Cherry Tree Lane and via the children's playground there; however, given the opportunities for recreational activities that will be present on the Site itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit Woodhall Wood on a regular basis, and any impacts are likely to be minor. As such, any negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

Appspound Wood LWS

- 8.4.321 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.
- 8.4.322 The ancient woodland lies c. 50m from the M1 motorway at its closest point although approximately half falls within 200m of the motorway. Traffic modelling has indicated that the AADT threshold will be exceeded and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to exceed 1% of the lower critical load (Ndep); however, this fell below the 1% threshold when using the more realistic and robust scenario with an emissions factor year of 2035 combined with traffic data for the year 2044. As such, air quality impacts on this site can be considered to be **not significant**.
- 8.4.323 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – the woodland is potentially accessible via a footpath that runs along the western side of the woodland between Appspound Lane and Bedmond Lane with very limited parking in a small layby on Appspound Lane. However, given the opportunities for recreational activities that will be present on the Site itself in the form of the Country Park and Valley Park, and the distance from the Site, it is unlikely that significant numbers of residents will visit the woodland on a regular basis, and any impacts are likely to be minor. As such, any negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

Windmillhill Wood and Adjoining Woodland LWS

- 8.4.324 Potential impact pathways during the operational phase are in relation to increased recreational disturbance. It lies over 200m from roads and therefore air quality effects from increased traffic during the operational phase are scoped out as **not significant**.
- 8.4.325 There are no public or permissive rights of way through the LWS which is part of the Gorhambury Estate, and therefore it is unlikely that there will be significant risk of damage or degradation of habitats as a result of increased visitors from the Development, even if visitor numbers to the accessible parts of the wider estate increase. In addition, the on-site provision of greenspace and recreational opportunities will, in any case, provide alternative options for general activity such as walking or other forms of exercise. As such, negative effects of increased recreational disturbance on the LWS are considered unlikely and **not significant**.

Great Revel End Farm LWS

- 8.4.326 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.
- 8.4.327 The site lies c. 15m from Gaddesden Lane, a C class/unclassified road and c. 130m from Holtsmere End Lane. Traffic modelling has indicated that this site does not fall within 200m of the operational ARN, and as such, air quality effects are considered **not significant**.

8.4.328 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance; there is a footpath that runs directly through the site from Gaddesden Lane; however, this is on a paved track which leads to the farm, microbrewery and tap room. It is feasible that the grassland habitats of the LWS either side could be accessed by visitors on foot; however, it is unlikely that this would be at levels significant enough to cause impact. As such, negative effects of increased recreational disturbance from the Development on the LWS are considered unlikely and **not significant**.

Widmore Wood LWS

8.4.329 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.

8.4.330 This ancient and semi-natural woodland and HPI lies 980m away from the Site, adjacent, in its entirety, to the south of the A4147 at Swallowdale Lane which links with Hogg End Lane, and is close to the B487 Hemel Hempstead Road (Redbourn Road) and other minor roads in the area. Traffic modelling has indicated that the AADT threshold will be exceeded close to the LWS and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). A precautionary calculated maximum PC was found to exceed 1% of the lower critical load (Ndep) at 25m of the road only; however, this fell below the 1% threshold when using the more realistic and robust scenario with an emissions factor year of 2035 combined with traffic data for the year 2044. As such, air quality impacts on this site can be considered to be **not significant**.

8.4.331 There is the potential for adverse effects on the habitats within the LWS from public access and disturbance – the woodland is accessible via footpaths from the A4147 and High Street Green that run along the north and west side of the wood. However, given the distance and nature of the site and the opportunities for recreational activities that will be present on the Development itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit the woodland on a regular basis, and any impacts are likely to be minor. As such, any negative effect of recreational pressures on the LWS is considered to be at a site level only and **not significant**.

Birch Wood (near Potters Crouch) LWS

8.4.332 Potential impact pathways during the operational phase are in relation to changes in air quality and increased recreational disturbance.

8.4.333 The woodland lies just over a kilometre away to the south-east of the Site on the opposite side of the M1 motorway near Potters Crouch. It is bisected by the A414 with the majority of the ancient replanted woodland site falling within 200m of the road, including an area of HPI deciduous woodland within Madam's Wood, and a larger area of HPI woodland adjacent but outwith the LWS boundary. Traffic modelling has indicated that the AADT threshold will be exceeded and thus this site was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). Using an emissions factor year of 2035 combined with traffic data for the year 2044, the calculated maximum PC was found to exceed 1% of the lower critical load (Ndep) at 25m of the road and then at 1.53% of the lower critical load and 1.02% of the upper critical load. Levels did not exceed 1% at 50m.

8.4.334 Assuming a band of 25m of habitat along the road would be subject to increased nitrogen deposition over 1% of the critical load, this would amount to at least c. 12.8% of the 21.57ha LWS potentially affected, which is not inconsequential. The characteristics of the woodland habitat directly along the A414 are, however, already likely to reflect lower than desirable air quality (with existing background levels of nitrogen deposition at 26.3-26.4kgN/ha/yr along this stretch, of which 14.7% is attributable to road transport).¹¹⁵). Increased levels as a result of the Development may exacerbate existing effects in this band; however, it is unlikely to fundamentally change the value of the woodland parcel as a whole, and therefore air quality impacts are considered to be negative but likely **not significant**.

8.4.335 There is a public footpath (FP36, accessible from the A4147 Hemel Hempstead Road) that runs close to the northern boundary of the woodland but does not go through it. Given the distance, lack of direct access and the opportunities for recreational activities that will be present on the Development itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit the woodland on a regular basis. As such, it is considered that there will not be any noticeable effects on the LWS as a result of recreational disturbance during the operational phase of the Development and is therefore **not significant**.

Local Wildlife Sites over 1km from Site

8.4.336 **Table 8.11** presents the impact assessment for those remaining LWS which lie over 1km from the Development, taking into account the mitigation embedded within the Development.

Table 8.11: Impact Assessment of Local Wildlife Sites over 1km from Development

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
Redbourn Common	1.16 N	Air quality, recreational disturbance, water quality, abstraction	<p>A small proportion of the largely neutral grassland site within 200m of B487 Hemel Hempstead Road. Traffic modelling indicates AADT threshold is exceeded; however, PC as a % of critical load (Ndep) does not exceed 1%. Air quality effects on LWS are therefore considered not significant.</p> <p>Publicly accessible common within Redbourn village. Informal paths crisscross the grassland. A Public Right of Way (ProW) runs roughly north-south through the middle with a small, dedicated parking area off North Common road, and parking at the cricket club on West Common road. A children’s playground and sports facilities are present. Negative effect at Site level – not significant.</p> <p>The River Red, a tributary of the River Ver, runs across the southern end of the site. No impacts to water flow/levels are anticipated owing to embedded measures to reduce water demand and following confirmation from Affinity Water of</p>

¹¹⁵ APIS app | APIS

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
			<p>sufficient resource. Therefore, effects on water quality are not significant.</p> <p>Foul water is to be discharged to the existing Thames Water network following Improvements but will not discharge to the River Red/Ver. Therefore, effects from foul drainage on the LWS are not significant.</p>
Bury Wood (near Redbourn)	1.17 N	Air quality, recreational disturbance	<p>Almost all of this ancient and HPI woodland falls within 200m of M1; however traffic modelling has indicated that it falls outside the ARN and therefore air quality effects are not significant.</p> <p>Small woodland to west of M1 motorway. No ProW or dedicated parking on Flamsteadbury Lane. No noticeable effect – Not significant.</p>
Maylands Wood	1.17 W	Air quality, recreational disturbance	<p>This ancient and HPI woodland lies almost wholly within 200m of High Street Green and Wood End Lane; however, traffic modelling has indicated that it falls outside the ARN and as such, air quality effects are not significant.</p> <p>Small woodland between houses, industrial estate, and allotments/cricket ground to north. Accessible with well-marked entrances and paths but no facilities or dedicated parking. Negative effect at Site level – Not significant.</p>
Gorhambury Cottage Area	1.25 E	Recreational disturbance, lighting	<p>Within the Gorhambury Estate. No public access. No noticeable effect – Not significant.</p> <p>Illumination of retained habitats on the Development Site unlikely to affect bats associated with this site. Enhancement of habitats in East EH noted - negligible – not significant.</p>
Gorhambury Icehouse	1.27 E	Recreational disturbance, lighting	<p>Within the Gorhambury Estate. No public access. No noticeable effect – Not significant.</p> <p>Illumination of retained habitats on the Development Site unlikely to affect bats associated with this site. Enhancement of habitats in East EH noted - negligible – not significant.</p>
Long Deans Wood	1.31 SW	Air quality, recreational disturbance	<p>A strip of largely secondary woodland, but including the ancient and HPI element of the LWS, falls within 200m of Bunkers Lane. Traffic modelling indicates that it falls outside the ARN, and as such, air quality effects are not significant.</p> <p>The Wildlife Trust reserve boundary lies along the woodland edge and is likely accessible informally to visitors to the meadow below. Negative effect at Site level – Not significant.</p>

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
Long Deans Meadow	1.32 SW	Air quality, recreational disturbance	<p>A strip of this largely neutral grassland LWS lies within 200m of Bunkers Lane. Traffic modelling indicates that it falls outside the ARN, and as such, air quality effects are not significant.</p> <p>Managed by the Wildlife Trust and publicly accessible. Well-marked access points along Bunkers Lane at either end and paths throughout. No dedicated parking or facilities. Negative effect at Site level – Not significant.</p>
Wellfield Spring	1.42 S	Recreational disturbance	Small woodland within field. No ProW. No noticeable effect – Not significant
Temple Cottage Area, Gorhambury	1.45 E	Recreational disturbance, lighting	<p>Within the Gorhambury Estate. No public access. No noticeable effect – Not significant.</p> <p>Illumination of retained habitats on the Development Site unlikely to affect bats associated with this site. Enhancement of habitats in East EH noted - negligible – not significant.</p>
Ver Valley (by Chequer Lane)	1.51 NE	Air quality, recreational disturbance, water quality, abstraction	<p>The northern end of this LWS sits adjacent to the B487 Hemel Hempstead Road with the remainder of the LWS within 200m of the A5183. Traffic modelling indicates that the site falls within the ARN; however, PC as a % of critical load (Ndep) does not exceed 1%. Air quality effects on LWS are therefore considered not significant.</p> <p>No PRoW or likely access through LWS itself but footpaths to north and south. Publicised walk (Ver Valley Walk 4.¹¹⁶) follows southern route from Redbournbury Mill. No noticeable effect – Not significant.</p> <p>No impacts to water flow/levels are anticipated owing to embedded measures to reduce water demand and following confirmation from Affinity Water of sufficient resource. Therefore, effects on water quality are not significant.</p> <p>Foul water is to be discharged to the existing Thames Water network following Improvements but will not discharge to the River Ver. Therefore, effects from foul drainage on the LWS are not significant.</p>
Rant Meadow Wood/ Bennets End Pit	1.59 W	Air quality, Recreational disturbance	<p>More than half of this HPI woodland LWS lies within 200m of Bennets End Lane; however, traffic modelling has indicated that the site falls outside the ARN and as such, air quality effects are not significant.</p> <p>Small woodland between houses, allotments and an adventure playground. Accessible with well-marked entrance off Rant</p>

¹¹⁶ [the-redbournbury-walk.pdf](#)

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
			Meadow and paths through wood but no facilities or dedicated parking. Negative effect at Site level – Not significant.
Featherbed Lane Copse by Serge Hill	1.60 S	Air quality, recreational disturbance	<p>Approximately one third of this wooded green lane with features of ancient origin lies within 200m of the M1 motorway; however, traffic modelling has indicated that the site falls outside the ARN and as such air quality effects are not significant.</p> <p>No ProW along lane itself although feasible it could be used as part of route between Serge Hill Lane and Bedmond Lane via other footpaths; however, unlikely to be a major draw. No noticeable effect – Not significant</p>
Potters Crouch Section	1.63 SE	Recreational disturbance	Small woodland within arable field. No ProW. No noticeable effect – Not significant.
Long Spring (Potters Crouch)	1.65 SE	Air quality, recreational disturbance	<p>A small proportion of this thin strip of ancient woodland, mostly replanted with Scots pine, falls within 200m of the A414. Traffic modelling has indicated that the AADT threshold is exceeded. Using an emissions factor year of 2035 combined with traffic data for the year 2044, the calculated maximum PC was not found to exceed 1% of the lower critical load (Ndep). Air quality effects on LWS are therefore considered not significant.</p> <p>Small woodland within arable field. No ProW, Private land signs from roadsides. No noticeable effect – Not significant.</p>
Serge Hill Meadow	1.70 S	Recreational disturbance	No ProW but potential access via paid entrance to the Serge Hill Project (Barn Garden). Managed, mown pathways through site. Negative effect at Site level – Not significant.
Redbournbury Meadows	1.73 E	Air quality, recreational disturbance, water quality, abstraction	<p>There is c. 850m of the A5183 where the western boundary of this LWS, which includes HPI coastal and floodplain grazing marsh and meadow along the chalk stream, falls adjacent. Traffic modelling, however, has indicated that the site falls outside the ARN and as such, air quality effects are not significant.</p> <p>No ProW or likely access through LWS itself but footpaths to north and south. Publicised walk (Ver Valley Walk 4.¹¹⁷) follows southern route from Redbournbury Mill. No noticeable effect – Not significant.</p> <p>No impacts to water flow/levels are anticipated owing to embedded measures to reduce water demand and following confirmation from Affinity Water of sufficient resource. Therefore, effects on water quality are not significant.</p>

¹¹⁷ [the-redbournbury-walk.pdf](#)

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
			Foul water is to be discharged to the existing Thames Water network following Improvements but will not discharge to the River Ver. Therefore, effects from foul drainage on the LWS are not significant
Hay Wood (Holtmere)	1.77 NW	Recreational disturbance	Small woodland within arable field. ProW and bridleway along southern and western boundary but none through woodland. No parking or facilities. No noticeable effect – Not significant
Scrubs Wood	1.88 SE	Recreational disturbance	Small woodland surrounded by arable farmland and private property (Wimbushes). No ProW, Private land signs from roadside. Informal parking evident on Ragged Hall Lane but likely associated with Park Wood below. No noticeable effect – Not significant.
New Wood (W of Redbourn)	1.93 N	Recreational disturbance	Small woodland within arable field. ProW along eastern boundary but none through woodland. No parking or facilities. No noticeable effect – Not significant
Park Wood (near Chiswell Green)	1.94 SE	Air quality, recreational disturbance	<p>Over half of this woodland LWS falls within 200m of the A414 which bisects the site. Almost all of the woodland is replanted with conifers with more diverse habitat (HPI deciduous woodland) along the southern edge with Ragged Hall Lane. Traffic modelling indicates the AADT threshold is exceeded and the site falls within the ARN. Using an emissions factor year of 2035 combined with traffic data for the year 2044, the calculated maximum PC was found to exceed 1% of the lower critical load (Ndep) but only at 25m of the road and then at 1.36% of the lower critical load and 0.91% of the upper critical load. Levels were not exceeded at 50m. Assuming band of 25m from the road is subject to increased levels above 1%, this would amount to c. 9.2% of the 19.75ha LWS potentially affected, which is not inconsequential; however, the habitats directly along the A414 are already likely to reflect lower than desirable air quality (with existing background levels of nitrogen deposition at 26.3kgN/ha/yr along this stretch, of which 14.7% is attributable to road transport¹¹⁸ and it is unlikely that the change will significantly alter the habitat composition across the woodland parcel as a whole. As such, air quality impacts on this site are considered to be negative but not significant</p> <p>Well marked entrances from Ragged Hall Lane and paths throughout but no facilities or dedicated parking. Negative effect at Site level – Not significant</p>

¹¹⁸ APIS app | APIS

LWS	Distance (km) and orientation from Site	Potential impact pathways	Impact assessment
Piecorner and Hanging Wood	1.99 S	Air quality, recreational disturbance	<p>Adjacent to Millhouse Lane off Bedmond Road. Traffic modelling indicates the site falls outside the ARN and as such, air quality effects are not significant.</p> <p>Woodland to north of Mill House Lane. No formal access, ProW or parking. Some fenced sections along road. No noticeable effect – Not significant</p>

Habitats

Ancient woodland, ancient and veteran trees

- 8.4.337 There are no ancient or veteran trees on the Site. There are 16 areas of woodland within a 2km radius of the Site that appear on the Ancient Woodland Inventory (AWI). Many of these are also designated as LWS, the closest being Blackwater Wood LWS located 240m south of the Site, and these are covered in the relevant LWS sections above. In addition, there is a 1.79ha area of ancient (replanted) woodland at Square Wood which is contiguous with Prae Wood LWS on the east side of the M1 motorway, c. 960m east of the Site, and a c. 0.86ha area of ancient and semi-natural woodland and HPI (Yew Tree Wood) approximately 1.5km to the west of the Site within the Cupid Green area of Hemel Hempstead.
- 8.4.338 Potential impact pathways on these habitats during the operational phase include changes to air quality and effects on sensitive woodland habitats, and recreational disturbance, including damage and degradation of habitats, as a result of an increase in visitors from the Development.
- 8.4.339 Square Wood lies over 780m from the A414 and M1 motorway and no effects on ancient woodland arising from changes to air quality due to increased traffic from the Development on the roads is anticipated. Traffic modelling has confirmed it falls outside the ARN.
- 8.4.340 Yew Tree Wood lies c. 100m of the A4147 before it joins the B487 Hemel Hempstead Road (Redbourn Road). Almost all of the habitat parcel falls within 200m of the road. Traffic modelling has indicated that the AADT threshold will be exceeded close to Yew Tree Wood and that it therefore falls within the ARN. Therefore this woodland was subject to more detailed air quality assessment (see **ES Volume 2, Chapter 11 – Air Quality**). This concluded that the calculated maximum PC for the Development does not exceed 1% of the critical load (Ndep) and therefore that air quality impacts can be considered inconsequential (**not significant**).
- 8.4.341 There is the potential for adverse effects on the habitats within Square Wood from public access and disturbance; however, there do not appear to be any tracks through this part of the woodland at Prae Wood and there is no formal parking or facilities for visitors nearby. Given the opportunities for recreational activities that will be present on the Site itself in the form of the Country Park and Valley Park, it is unlikely that significant numbers of residents will visit Square Wood on a regular basis, should access be possible, and any impacts are likely to be minor. As

such, any negative effect of recreational pressures on the ancient woodland is considered to be at a site level only and **not significant**.

8.4.342 The Nickey Line runs through the north of Yew Tree Wood along a rough surfaced path. An interpretation board is present at the eastern end. Informal access through the rest of the woodland is possible. As a result, there is the potential for increased damage and disturbance to habitats should visitor numbers rise. However, the on-site provision for greenspace is considered sufficient to reduce likely visitor numbers to the extent that any effect would be significant at the Site level at most, which is **not significant**.

Habitats of Principal Importance

Deciduous Woodland (on-site)

8.4.343 Two parcels of HPI deciduous woodland are located on the Site. Of these, one is designated as an LWS (Westwick Row Wood) and is classified as old, possibly ancient, which will be retained in its entirety. The second parcel lies in EH North and will be retained and integrated within the proposed Country Park and associated landscaping.

8.4.344 Potential impact pathways during the operational phase of the Development include changes to air quality from increased traffic on surrounding and (new) on-site roads and the effect on sensitive woodland habitat, recreational disturbance, including damage and degradation of habitats, an increase in surface water flooding as a result of the increase in impermeable surfaces on the Site and possible concomitant contamination of soils, and artificial lighting (covered under the relevant species sections). Impacts on the HPI deciduous woodland at Westwick Row Wood are covered above in 8.4.296 onwards.

8.4.345 The HPI deciduous woodland in EH North lies c. 200m south of the B487 Hemel Hempstead Road (Redbourn Road) and just outside the operational ARN based on the traffic modelling undertaken. Surface water flooding is unlikely given the proposed drainage strategy, and its position within the Country Park away from the built-up areas. It is possible that it will be subject to pressures associated with recreational use of the area, namely direct damage or destruction of the woodland features. As such, in the absence of mitigation, long-term local level effects are possible and this is considered to be **moderate adverse (significant)**.

Deciduous Woodland (off-site)

8.4.346 There are numerous other parcels of HPI deciduous woodland within 2km of the Site and beyond. For the vast majority, no noticeable effects (not significant) are anticipated in relation to their distance from the Site and accessibility. Outside of those covered already as part of the assessment of impacts on LWS, recreational disturbance is unlikely on the majority as they are largely small, privately owned parcels of land, not readily accessible to the public. Given the on-site provision for recreation, any increase in visitor numbers or negative effect is likely to be **not significant**.

8.4.347 Those lying within the operational ARN include Little Furzewood, (M1 motorway), woodland adjacent to Birch Wood LWS (A414), those parcels associated with Prae Wood LWS (A4147 Hemel Hempstead Road), parcels outside Redbourn village and within the Ver Valley LWS, Woodhall Wood LWS and parcels to south of B487 Hemel

Hempstead Road (Redbourn Road), Yew Tree Wood (A4147), Widmore Wood LWS (A4147), woodland near Spencer's Park play area, woodland at Pratt's Dell (Three Cherry Trees Lane), woodland around Marchmont Pond (A414 Breakspear Way) and parcels either side of the A414 near Chisnell Green (including St Julian's Wood). An air quality assessment has been undertaken to assess the significance of effects on these receptors (see **ES Volume 2, Chapter 11 – Air Quality**) as summarised below:

- Little Furzewood: PC less than 1% of critical load (Ndep) – air quality effects **not significant**.
- Woodland adjacent to Birch Wood LWS: PC does not exceed 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 – air quality effects **not significant**.
- Woodland associated with Prae Wood LWS: PC does not exceed 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 – air quality effects **not significant**.
- Woodland south of B487 Hemel Hempstead Road (Redbourn Road): PC does not exceed 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 – air quality effects **not significant**.
- Woodland near Spencer's Park play area: PC less than 1% of critical load (Ndep) – air quality effects **not significant**.
- Woodland at Pratt's Dell: PC does not exceed 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 – air quality effects **not significant**.
- Woodland at Marchmont Pond: PC exceeds 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 at 25m from road only – at 50m from the road, the PC does not exceed the threshold. Assuming a band of 25m of habitat along the road is subject to increased levels of nitrogen deposition above the 1% threshold, this equates to c. 21% of the 27.2ha area of HPI woodland at this location. Existing background levels in this area are 27.2kgN/ha/yr, of which 14.4% is attributable to road transport. It is likely that the habitat present in close proximity to the road is already exhibiting characteristics of exposure to higher than desirable levels of nitrogen deposition; however, the increase may result in an exacerbation of this, resulting in a **minor adverse effect at the local level**. On HPI woodland resource as a whole within the ZoI of the Development, however, this is likely to be **not significant**.
- Woodland north of A414 at Chiswell Green: PC exceeds 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 at 25m from road only. This parcel of HPI woodland which lies directly adjacent to the A414 is only 38m at its widest point, and thus almost all of the woodland here will be subject to increased nitrogen deposition over the 1% threshold. Existing background levels in this area are 25.9 – 26.1kgN/ha/yr, of which 14.7% is attributable to road transport. It is likely that the woodland habitat here is already exhibiting characteristics of exposure to higher than desirable levels of nitrogen deposition, and the increase may result in an exacerbation of this, resulting in a **minor adverse effect at the local level**. On HPI woodland resource as a whole within the ZoI of the Development, however, this likely to be **not significant**.

- St Julian's Wood: PC does not exceed 1% of critical load (Ndep) using more realistic scenario with an emissions factor year of 2035 combined with traffic data for the year 2044 – air quality effects **not significant**.

Coastal and Floodplain Grazing Marsh

8.4.348 There are four parcels of Coastal and floodplain grazing marsh within 2km of the Site which have been valued at County level importance. The nearest two parcels are located beyond the M1 motorway, approximately 1.5km to the north-east of the Site along the River Ver adjacent to the A5183 and B487 Hemel Hempstead Road (Redbourn Road) just south of Redbourn village, close to the Ver Valley (by Chequer Lane) LWS. The other two lie on the east side of the A5183, also along the River Ver but within the LWS there.

8.4.349 As discussed for the LWS, no direct impacts as a result of increased recreational disturbance are considered likely owing to the lack of permitted access and general unsuitability of the terrain for walking and other activities. The embanked M1 motorway and distances between the Site and the habitat remove any potential for surface water runoff from the Site, even in the absence of the proposed drainage strategy. These potential effects are therefore considered **not significant**.

8.4.350 Traffic modelling has indicated that the HPI parcels fall outside the ARN for the operational phase and therefore air quality effects are assessed as **not significant**.

8.4.351 No impacts to water flow/levels within the River Ver catchment are anticipated owing to embedded measures to reduce water demand and following confirmation from Affinity Water of sufficient resource. Therefore, effects on water quality as a result of potential changes to water levels or flow are therefore unlikely and **not significant**.

8.4.352 Foul water is to be discharged to the existing Thames Water network following improvements to make sure there is sufficient capacity within the system. The wastewater is to be treated at Maple Lodge which discharges to the River Colne. Therefore, effects from foul drainage on the coastal and floodplain grazing marsh habitat are **not significant**.

Wood Pasture and Parkland

8.4.353 There is one area of HPI wood pasture and parkland (c. 200ha in size) within 2km of the Site centred around Gorhambury House and located approximately 400m to the east of the Site beyond the M1 motorway. This has been valued at County Level Importance.

8.4.354 Public access within the wider estate is limited; there are permitted routes along Gorhambury Drive and to other localised parts of the estate, and it is possible that habitats in these areas may be subject to greater pressures associated with trampling or damage. Dogs are permitted but must be kept on a lead. Given the restricted access to the vast majority of the estate, and the opportunities available for recreation on the Development Site in the form of the Country Park and Valley Park, no significant effects on the wood pasture and parkland habitats from increased recreational pressure are anticipated. Recreational effects are therefore **not significant**.

8.4.355 The wood pasture and parkland lie over 680m from main routes to site such as the A414 and M1 motorway but a small section lies adjacent to the A5183. Traffic modelling has, however, indicated that none of the HPI habitat parcels fall within the ARN for the operational phase and as such, air quality effects are assessed as **not significant**.

Traditional Orchards

8.4.356 Several parcels of HPI traditional orchard within 2km of the Site lie within 200m of roads; however, none fall within the operational ARN based on the traffic modelling undertaken, including that along Westwick Row adjacent to the Site. As such, air quality effects on HPI traditional orchards are considered **not significant**.

8.4.357 No other significant effects on traditional orchards are anticipated during the operational phase. The parcel adjacent to the Site is within private property and no issues are expected as a result of public access, recreational activity or urban effects. There will be a landscape buffer between the Site and the orchard which will further restrict access and minimise the risks of any effects from possible light spill or dumping of garden waste from nearby new residential properties. The remaining parcels are sufficiently far enough away and are within private land ownership and/ or present no draw from residents and visitors to the Development such that recreational pressure and urban effects are not anticipated.

HPI Hedgerows

8.4.358 Potential impact pathways on hedgerows during the operational phase include direct damage and loss. Indirect effects include disturbance and light spill which may affect their capacity to serve as wildlife corridors, and nesting/refuge habitat for birds and other species. No significant effects on HPI hedgerows are anticipated given that there will be buffers of at least 4m from the centre line of all hedges as a minimum from built form and through the measures within the Lighting Impact Assessment in **ES Volume 3, Appendix 8.14**. No other effects are considered likely (**not significant**).

Species

Badger

Habitat loss and fragmentation

8.4.359 In the longer-term, the areas of grassland, scrub, woodland associated with the Country Park, Valley Park and landscaping will provide high quality foraging habitat for badgers across the Site. It is likely to offer opportunities for further sett construction in addition to those being retained and the artificial setts to be created as part of the licensed sett closures. Although not actively encouraged, garden habitat is also likely to be of value to the species. The total extent of habitat available, once established, will be less than the baseline but will arguably be of higher quality than the largely arable farmland currently present, provided it is readily accessible. It is anticipated though that in the short to medium term, there will be a lag concurrent with part of the operational phase of the Development between the creation of the habitats within the Country Park, Valley Park and green corridors and the establishment of habitats of full value to badgers for foraging and commuting.

- 8.4.360 In the absence of mitigation, the new road network also has the potential to fragment, or deter the use of, the full extent of newly created and retained semi-natural habitat otherwise available to them within and adjacent to the Site boundaries. Artificial lighting of green corridors may also reduce the 'availability' of retained and newly created habitat to badgers and effectively create barriers to movement.
- 8.4.361 Sett TEM14 within EH South is to be replaced by a new sett within a green corridor to the north-west of its current location (c. 400m away). This will link in with the new Valley Park and other habitat corridors across EH South, including the vegetated noise bund (once established) along the M1 motorway.
- 8.4.362 The network of green corridors proposed within the Site will be bisected by the STC separating badgers from Sett TEM14 from areas currently used for territorial marking and likely foraging (along Westwick Row primarily). Three underpasses have been designed into the Development within EH South and are considered embedded mitigation (see Parameter Plan – Green Infrastructure). Their locations have been chosen to retain existing routes identified during the badger bait marking survey, to provide connectivity to the network of proposed habitats and also to reduce badger road collision risk. The underpasses will measure at least 600mm in diameter with good habitat connectivity and vegetation cover up to the entrances, and with good drainage to avoid surface water flooding. Fencing or structural planting will be used alongside the road, where necessary, to help guide badgers to the entrances.
- 8.4.363 Badgers from Sett 11 (off-site to the west of Green Lane in the south) are likely to be using off-site resources to west and south already. Limited activity has been noted on Site, and that which has suggests badgers are crossing Green Lane in at least two locations. The proposals will not change this significantly and no significant fragmentation effects to off-site resources are therefore expected. There will also be an accessible link to the Valley Park east of Green Lane, which then leads across the wider Site.
- 8.4.364 Badgers from Sett 31/14 in EH Central will be provided with a new sett in an area of scrub, woodland and grassland planting in the west (within the Buncefield Exclusion Zone, which is to be managed for the benefit of nature conservation with limited public access), c. 400m from the existing sett, and over 30m from any noise and activity generated by the commercial activities to the west. Subject to crossing the STC, this will enable badgers access to the M1 motorway vegetated noise bund to the east once constructed and replanted, and potential links to the habitat on the opposite side of the M1 motorway will remain a possibility via the existing underpasses on Hogg End Lane and Punchbowl Lane. Access to off-site resources to the west will remain. No significant fragmentation effects are anticipated with off-site resources. To facilitate the movement of badgers across the STC, an underpass will be provided as per the specifications above.
- 8.4.365 Within EH North, Sett A-C along the Nickey Line will be closed with a new sett provided in existing woodland within the Country Park which will provide much improved habitat for badgers on Site. The associated Annex 18 sett is to be retained and will also be within the Country Park. Three underpasses, with associated fencing and planting, will be provided to facilitate east-west movements across the STC and provide a green corridor from the Country Park to greenspace in the west of the Site and off-site. One of these will lie alongside the Nickey Line and the other two further south. Access to off-site habitats to the west will remain largely unaffected by the Development. The

proposed junction works on B487 Hemel Hempstead Road (Redbourn Road) to the north, once operational, will not present a barrier to movements off-site in this direction, however no additional connectivity will be provided off-site to the north of B487 Hemel Hempstead Road (Redbourn Road) as this is considered a territorial boundary between the Sett A-C and a Sett within the North Hemel development north of the Site. The eastern section, away from the access onto the Site and north of the Country Park will remain unlit and traffic speeds along the road are required to be 30mph maximum at this location.

- 8.4.366 Given the above, there are not anticipated to be significant impacts on badgers as a result of habitat loss or fragmentation during the operational phase of the Development. This is contingent to a degree on the assumed phasing outlined as part of the Construction Phase to reduce the effects of the time lag between habitat creation and establishment which may otherwise result in a loss of accessible foraging resource for badgers on Site. On this basis, the effects of habitat loss and fragmentation during the operational phase are considered to be negative at the site level only, which is **not significant**.

Killing or injury

- 8.4.367 During the operational phase, there is potential for increased mortality and injury as a result of road traffic collisions within the Site. Landscape corridors and the Country Park and Valley Park run throughout the Site, providing a high-quality resource for badgers; however, these are bisected by the new road network, and in particular the STC which runs roughly north-south. There is also a risk that badgers will displace into off-site areas which may increase road collisions on surrounding roads, bring them into territorial conflict with other badger social groups and the public (for example, if they move into adjacent gardens or public spaces such as the cemetery).
- 8.4.368 As detailed above, road underpasses for badger have been embedded into the design of the Development at key locations which link greenspace either side. The underpasses will measure at least 600mm in diameter with good habitat connectivity and vegetation cover up to the entrances, and with good drainage to avoid surface water flooding. Fencing or structural planting will be used alongside the road, where necessary, to help guide badgers to the entrances. The underpasses will reduce the likelihood of road traffic collisions on Site.
- 8.4.369 A number of replacement setts are to be provided alongside those to be retained on-site. Where these are located within areas that are potentially accessible to the public and dogs, there is a risk of interference to setts and the badgers within. Whilst the likelihood of deliberate killing or injury occurring as a result of public interference is considered low, it cannot be discounted, likewise accidental injury by dogs.
- 8.4.370 Sett TEM14 within EH South will sit within a green corridor, away from the built elements of the proposal, but potentially in proximity to access routes such as cycle and footpaths. The artificial sett designed to replace Sett 31/14 in EH Central is within an undeveloped green corridor but away from designated public access routes, and that in EH North (to replace Sett A-C) is within the Country Park. This has been located away from the Nickey Line which will be used by residents of the scheme but by its nature, the Country Park will be used for recreational purposes.

8.4.371 Given the above, and in the absence of additional mitigation, it is considered that the impact arising from killing or injury during the operational phase is negative in the long-term at the local level, which is **moderate adverse** and therefore **significant**.

Disturbance

8.4.372 As discussed above, a number of replacement setts are to be provided alongside those to be retained on-site, within undeveloped, greenspace areas and hedgerows of the Site. There is, nonetheless, a risk of disturbance from the public and their companion animals. This may be in the form of direct interference with the setts, inadvertent disturbance by public and dogs, or through noise and vibration associated with daytime activities in the vicinity such as bike scrambling and den building. Noise from new and existing roads, depending on the proximity of the sett, may also cause disturbance to badgers whilst underground. Artificial lighting of sett locations, access corridors to and from the sett, and within the wider network of greenspace that will be of value to foraging badgers is a further potential source of disturbance to badgers at night.

8.4.373 Baseline noise levels have been measured across the Site. All proposed locations of the new main setts are within areas that currently experience less road noise than the main setts they are replacing, although it is not known yet what the projected noise levels across the Site will be during the operational phase. Noise from the M1 motorway, however, is likely to be less than the baseline owing to the need to mitigate from human receptors and the proposed construction of the new noise bund on the eastern boundary within EH South and part of EH North. Given that badgers are currently utilising setts within the 60dB(A) noise contour, disturbance effects from operational road noise are not considered significant. The new sett in EH Central (Buncefield Exclusion Zone) will lie at least 30m from the built form which is to be commercial/mixed industrial in nature (classes E(g), B8 and B2)). Although the exact nature of use is not known at this stage, it will not be heavy industry and, at this distance, is unlikely to cause significant noise disturbance above the levels badgers are known to tolerate. As with road noise above, levels will be regulated in any case to accommodate human receptors.

8.4.374 Several of the outlier setts lie along retained hedgerow features. Wherever possible, these will be retained *in situ* to minimise loss of refuge opportunities; however, where disturbance levels are anticipated to be too high, they will be closed under licence from Natural England. The requirement for closure will be identified at the detailed planning stage once the exact layout, and proximity to residential housing is known.

8.4.375 Current lux levels across the Site are between 0 and 0.5 lux with the exception of three locations: at the roundabouts along Green Lane, adjacent to the Maylands Industrial Estate and the Buncefield Terminal, where levels range from between 5.6 and 11.5 lux. There is little to no light spill onto the area from the M1 or surrounding residential developments. As such, it will be important to make sure that retained and newly created features are not subject to high levels of artificial lighting from e.g. road and street lighting, footpaths and cycleways, external security lighting and spill from internal sources through windows. A network of dark corridors should be available across the Site to allow badger and other nocturnal wildlife to forage and move through the landscape.

8.4.376 In the absence of such mitigation, the effects of disturbance of badgers, primarily through lighting and increased human activity at the Site, during the operational phase is considered to be negative at the local level and therefore **moderate adverse**, which is **significant**.

Bats

Killing or injury

8.4.377 Increased predation from cats is likely given the proximity of residential housing to retained and created habitats of value to bats, although the effects at a population level are not fully understood.¹¹⁹ Domestic cat home ranges have been shown to be up to just under 7ha in studies of cat behaviour.^{120, 121}, although more typical ranges were in the region of just under 2ha. Cats hunt on instinct, irrespective of how well fed they may be. Approximately a quarter of households in the UK are thought to own at least one cat.¹²² which, given the quantum of residential development, could mean c. 1000 cats, not accounting for households that own more than one. Bats will primarily be vulnerable to predation if emerging from accessible roost locations.

8.4.378 In the absence of mitigation, the operation of the STC and increased traffic flow on surrounding existing roads (A414 Breakspear Way, A4147 Hemel Hempstead Road and the B487 Hemel Hempstead Road (Redbourn Road)) could increase the risk of vehicle related mortality and injury through collision with vehicles. The risk of direct mortality through operation of the Development is permanent. Impacts from operational road lighting are most likely to affect bat species through increased traffic collisions for species such as pipistrelle that will actively forage on insects attracted to lighting.

8.4.379 Collision resulting in mortality of bats occurs in areas where bats attempt to cross the road when following existing or new linear features (hedgerows, tree lines, and other features). With reference to Elmeros *et al.*, (2016), this is particularly relevant to the woodland species present on-site such as *Myotis* species and brown long-eared bat, which are more reluctant to fly in the open, tend to commute along linear features in the landscape and woodland edges and can fly low when commuting over gaps. Due to their low to medium flight height and propensity to forage in well-lit areas, pipistrelles, serotine and barbastelle are also at risk, though more-so from HDVs than regular vehicles given their typical flight-height over gaps of 2-10m, with no clear tendency to lower flight. Those species that typically fly higher, such as noctule and Leisler's bat are not considered to be a high-risk species (flight height >10m) but can fly lower when hunting or immediately upon emergence.

8.4.380 The majority (95%) of common pipistrelles observed during the crossing point surveys were flying at collision risk height where taken to be 5m, which corresponds to the average height of a HDV. Extrapolating to those passes recorded on statics but not observed directly would suggest there is potential for significant impact on this species

¹¹⁹ Woods, M., McDonald, R. & Harris, S. (2003) Predation of wildlife by domestic cats *Felis catus* in Great Britain. *Mammal Review* 33(2): 174-188.

¹²⁰ Thomas, R.L., Baker, P.J. & Fellowes, M.D.E. Ranging characteristics of the domestic cat (*Felis catus*) in an urban environment. *Urban Ecosyst* 17, 911-921 (2014). <https://doi.org/10.1007/s11252-014-0360-5>

¹²¹ Hugh J Hanmer, Rebecca L Thomas, Mark D E Fellowes, Urbanisation influences range size of the domestic cat (*Felis catus*): consequences for conservation, *Journal of Urban Ecology*, Volume 3, Issue 1, January 2017, jux014, <https://doi.org/10.1093/jue/jux014>

¹²² Murray, J.K., Gruffyd-Jones, T.J., Roberts, M.A., & Browne, W.J. (2015) Assessing changes in the UK pet cat and dog populations: numbers and household ownership *Veterinary Record*, Volume 177, Issue 10, September 2015, P259. <https://bvajournals.onlinelibrary.wiley.com/doi/full/10.1136/vr.103223>

where new or existing roads with additional traffic cross existing commuting features within the landscape. Such locations may include where the Nickey Line and the hedgerows east of Cherry Tree Farm are crossed by the STC in EH North, and to a lesser extent, on Redbourn Road, where traffic flow is to increase.

- 8.4.381 Whilst LDV traffic levels on the Redbourn Road are predicted to increase by 12.75%, HDV movements will actually decrease by 3.75%, reducing the risk of collisions with HDVs. This road is currently subject to the national speed limit. Whilst the flight behaviour of different bat species and effects in different contexts vary, studies have found that roads with higher speed limits have higher bat casualties.^{123, 124} The speed limit will be reduced with the new road junction in the west and traffic calming measures, with cumulative scenario speeds of 42 and 36 mph for LDVs and HDVs modelled. Lighting will be introduced around the junction but will be absent east of this reducing associated adverse disturbance or attraction effects.
- 8.4.382 Along the STC in the north of the Development close to the Nickey Line, HDV passes are modelled to be around 36 per day, which would represent only 1.2% of the traffic flows at a predicted average speed of 21mph. HDV passes double to 72 per day 2.48% of traffic flows, moving slightly south along the STC (again at 21 mph).
- 8.4.383 The A4147 Hemel Hempstead Road, which borders the southern boundary of the Site is subject to a speed limit of 40 miles per hour. The new junctions on this road will result in lighting disturbance at point locations. There will be a 19% increase in traffic flows on this road; however, only 2% of this increase will be HDVs (41 additional traffic flows per day).
- 8.4.384 HDV and other traffic is set to increase on the A414 Breakspear Road; however, bat activity in this area is not high, most likely due to the existing deterrent effect of lighting, the lack of established roadside habitat and high flows of traffic.
- 8.4.385 Some roads that are currently in areas of known bat flight will be subject to reduction / removal of collision risks from traffic through closures to through traffic and/or inclusion in the HGC Quietway Network. This will mean Cherry Tree Lane, Punchbowl Lane, Hogg End Lane and Westwick Row will have all vehicular traffic removed. Green Lane North of Boundary Way, bordering the central west of the Site will have a 79% LDV and 72% reduction in HDVs.
- 8.4.386 Mortality due to traffic collisions from new roads severing existing flight lines and increased flows on existing roads present potential risk to species such as brown long-eared bats and *Myotis* species. Activity levels of brown long-eared bat and Natterer's bat on the Nickey Line were much lower overall than common pipistrelle but comparatively high (relative to the total number of passes recorded for the species and compared to other static locations on the Site) along the Nickey Line.
- 8.4.387 For more common and widespread species such as brown long-eared and Natterer's bat, whilst any mortality would be a negative effect, it is not considered to be significant beyond the site level given the small number of

¹²³ Daniel de Figueiredo Ramalho a b, Débora Resende b, Thiago Furtado de Oliveira a b, Rodrigo Augusto Lima Santos b c, Ludmilla Moura de Souza Aguiar a b d. Factors influencing bat road casualties in a Neotropical savanna. Perspectives in Ecology and Conservation Volume 19, Issue 2, April-June 2021, Pages 189-194

¹²⁴ J. Bafaluy; Mortandad de murciélagos por atropello en carreteras del sur de la provincia de Huesca Galemys, 12 (2000), pp. 15-23

bats thought to be present on the Site and the low speeds on the STC. For barbastelle, the number of passes recorded at the Nickey Line and across the wider Site, is greater and, given its rare status, the significance of impact is considered to be higher.

- 8.4.388 As a result, the significance of collision-related mortality during the operational phase is considered to be **moderate adverse (significant)** for both common pipistrelle and barbastelle with a negative effect at the Site level for other lower flying species or the assemblage as a whole (**not significant**).

Habitat loss / creation

- 8.4.389 There will be no further direct habitat loss during the operational phase beyond that incurred during construction. With the creation of the Country Park, Valley Park, wetland features and landscape planting it is considered that the extent of foraging habitat will increase compared to baseline levels and provide a benefit in the long-term. In the short term, there will be a lag between the destruction of habitats and the full establishment of the SANG and other planting, but this will be delivered in phases across the Site reducing the effects of the time lag which may otherwise result in a loss of accessible foraging resource for bats. This habitat creation/loss is considered in relation to the construction phase. On balance, habitat loss during the operational phase is therefore considered to be **not significant**.

Disturbance and habitat fragmentation

- 8.4.390 Potential effects upon bats associated with the LWSs designated for bats within the zone of influence of the Development are considered in the relevant sections above.
- 8.4.391 During the operational phase, there is scope for disturbance and displacement of foraging and commuting bats as a result of increased levels of artificial light at the Site. Generally, lux levels at the Site are very low, at many locations this is at 0 lux with other areas at only 0.5lux. Only in three locations in EH Central do levels exceed this. Future increases in artificial light may be the result of street and other infrastructure lighting, flood lights at sports pitches, security lighting around buildings, spill from internal lights of houses and other buildings and the intermittent passing of traffic at night.
- 8.4.392 Different species of bat have varying tolerances to artificial lighting at night. Those such as pipistrelles are regarded as light tolerant and are even attracted to certain wavelengths to forage on the greater insect biomass often present around light sources. Others, such as the *Myotis* species, brown long-eared bat and barbastelle – the species more adapted to woodland habitats – can be significantly affected. Such effects include delayed emergence from roosts, or even abandonment, and displacement from favoured foraging grounds with subsequent energetic cost, and from key commuting routes which in turn can affect the viability of roost sites.
- 8.4.393 Key areas of bat activity on the Site for those particularly light sensitive species include the Nickey Line, the woodland in the north-east of the Site, Westwick Row Wood and trees and hedgerows along Westwick Row itself. Other areas include the hedgerows to the east of Cherry Tree Farm and trees and hedgerows along Cherry Tree Lane and in the southeast corner of the site. Habitats in close proximity to known roosts sites in buildings and trees are also of greater importance as they will be used to directly link roost with foraging grounds and other

roosts sites within the landscape. An increase in artificial lighting at these locations will have a disproportionate impact on light sensitive bats compared to elsewhere within the Development site.

- 8.4.394 The Nickey Line is likely to form a key commuting route east-west across the landscape for several species, including light sensitive bats, providing a clear route to the woodland area in the north-east of the Site where activity levels for many species were also high, and potentially to habitats to the north and east of the Site. Several species of bats were found to be utilising Punchbowl Lane and Hogg End Lane in good numbers which also traverse the Site in an east-west direction and cross the M1 motorway via underpasses and provide potential access to high quality habitats around the Gorhambury Estate and River Ver. Cherry Tree Lane, which runs north-south along the western boundary of the Site in EH North, links into the Nickey Line, providing a north-south connect between the Nickey Line and Punchbowl Lane and Hogg End Lane. Barbastelle activity levels along Cherry Tree Lane were comparatively high during crossing point static survey. These commuting routes are currently unlit and provide dark vegetated corridors conducive to bat movement.
- 8.4.395 Cherry Tree Lane is to become part of the HGC green loop which will give pedestrians and cyclists priority and with restricted vehicle access. The northern section will adjoin the green open space of the SANG and there is to be a strip of edge habitat providing a buffer between the road and the Development site for the remainder. Likewise, for Punchbowl Lane and Hogg End Lane, these are to become Quietways which will also provide pedestrian and cyclist priority with restricted vehicle access. Lighting associated with traffic is therefore not a concern; however, illumination of the pedestrian and cycle path and spill from new residential and commercial areas adjacent have the potential to increase light levels above that which is favourable to bats.
- 8.4.396 The majority of the Nickey Line will remain as a dark corridor, as will the woodland in the north-east; however, at the point at which the STC bisects the Line, there will be lighting from the road and passing traffic. This has the potential to deter bats from using the feature for movement across the wider landscape, particularly those bats which may be moving up Cherry Tree Lane or are commuting from the west. The hedgerows to the east of Cherry Tree Farm are also likely to be subject to higher light levels owing to the STC and surrounding residential development and this could limit the accessibility of the Country Park for bats moving from the west.
- 8.4.397 Westwick Row Wood in EH South is thought likely to support roosting barbastelle and was a focus of activity for this species, alongside the woodland in the north-east of the Site, the Nickey Line and Cherry Tree Lane. Westwick Row woodland and the woodland in the north-east are to be retained as part of the Development and no direct impacts are likely to any roost sites within. Westwick Row Wood will be surrounded by a buffer of strategic open space and landscape planting of at least 15m in width which will help to limit light spill from adjacent residential development to the east, west and south. To the north, Westwick Row (road) is to become part of the HGC Circular Green Loop as per Cherry Tree Lane and therefore light spill from traffic is likely to be negligible. As for Cherry Tree Lane, however, lighting installations for pedestrian and cycle access, and external or security lighting for the proposed school on the opposite of the road, do have the potential to increase light levels beyond favourable levels within the wood/woodland edge habitat and trees and hedgerows along Westwick Row. In the absence of mitigation, there is also potential for key commuting routes out of the woodland to become illuminated. Based on

the survey data, bats are likely emerging from the woodland on both the northern and southern side of the woodland with one likely commuting route up Westwick Row beyond Westwick Farm.

8.4.398 Woodland in the north-east of the Site and likely commuting routes from it will be retained and will not be affected by artificial lighting owing to its siting within the proposed Country Park.

8.4.399 Noise and vibration from traffic have also been shown to affect bat foraging and commuting adversely particularly for gleaning and *Myotis* species such as brown long eared bats and can reduce foraging efficiency and/or disrupt commuting routes.

8.4.400 In the absence of mitigation, therefore, the adverse effect of artificial lighting and noise disturbance on sensitive species such as barbastelle, brown long-eared bats and myotis in particular, is considered to be **major adverse**, which is **significant**. Effects on more light tolerant species such as pipistrelles are considered to be negative but **not significant**.

Barn owl

Habitat loss

8.4.401 Once operational, there will be no further direct loss of habitats for barn owl beyond that which occurred during the construction phase, and as habitat creation and enhancement measures establish, there may well be a benefit for the species in the long term, particularly where grassland is created and managed to provide habitat for prey species. As such, the effects of habitat loss on barn owl in the operational phase are **not significant**.

Killing or injury

8.4.402 During the operational phase of the Development, there is a risk of increased mortality to barn owl primarily as a result of road traffic collision on new and existing roads. Barns owls habitually fly low, especially when hunting and within grassland along road verges. Collisions often occur when birds cross these roads to hunt the opposite side.¹²⁵ There will inevitably be a baseline rate of mortality already on existing roads in the area. This is unknown but deaths are most likely on the M1 motorway and A414 slip roads given the presence of suitable foraging habitat along them and the speed and volume of traffic they carry and the number of higher sided vehicles. Deaths may also occur along the other significant roads to the north and south (A4187 Hemel Hempstead Road and B487 Hemel Hempstead Road (Redbourn Road)) and elsewhere. It is estimated that in a typical year, over 40% of barn owls fledged are killed on roads. Although only 2% of roads in Britain are major roads (e.g., motorways and dual carriageways), over 90% of barn owl casualties occur here.¹²⁶

8.4.403 During the operational phase of the Development, it is expected that traffic volume on the existing major roads will increase and with it, the risk of road mortality. However, in view of the existing high levels of traffic on the high speed roads that present the greatest risk to barn owl, this increase is not considered to elevate risks notably

¹²⁵ <https://www.barnowltrust.org.uk/hazards-solutions/barn-owls-major-roads/>

¹²⁶ [Barn Owl Hazards: Major roads - The Barn Owl Trust](#)

beyond current levels. New roads associated with the Development itself, including the STC, pose little risk given their size and capacity and speed restriction.

8.4.404 In the absence of mitigation, the effects of killing or injury on barn owl are considered to be long-term but of likely effect at the site level only, which would be **not significant**.

Disturbance

8.4.405 It is known that barn owls are currently nesting in a tree (T141) along a hedgerow within EH South. Other nest sites used include that to the east of EH East and in a treeline south of Westwick Row (also in EH South).

8.4.406 The known nest sites are to be retained. That on the opposite side of the M1 motorway will not likely be subject to any disturbance by residents or visitors to the Development given that there is no public access. The tree (T141) within the retained hedgerow in EH South and south of Westwick Row will lie in close proximity to areas of development which may deter future use due to increased levels of human activity and noise disturbance, as well as the loss of habitat in direct proximity. While the potential loss of two nest sites is a negative effect, it is not considered significant enough to affect population levels locally given that there is an abundance of alternative habitat in the wider landscape as well as several potentially suitable trees to be retained on Site that sit within larger areas of greenspace.

8.4.407 Away from the nest, barn owls are considered likely to continue to be able to utilise the greenspace within the Site for foraging and commuting once established. There will be a lag between the initial works to create habitats within the Country and Valley Park and other green corridors on Site, and them becoming of value to barn owl and their prey. This may mean in the short term, some displacement of foraging individuals into the wider landscape where there is much suitable alternative habitat; however, habitat creation will commence early in the phasing of development across the Site and rough grassland will be relatively quick to establish compared to other habitats such as woodland. Any temporary effect is therefore likely to be reversible in the medium to long term.

8.4.408 A Lighting Impact Assessment has been produced (**ES Volume 3, Appendix 8.14**) which details potential mitigation solutions with respect to primarily bats and badgers but which will also benefit barn owls and other nocturnal wildlife in preventing the illumination of key foraging and commuting habitat although barn owls seem little affected by artificial lights and may even use them as an aid to hunting¹²⁷. This has not been considered embedded mitigation at this stage. In the absence of such mitigation, the effects of disturbance on foraging and commuting barn owls is considered negative but likely only at the site level given that there is ample habitat within the wider landscape and large numbers of birds would not be affected. As such, this effect is considered **not significant**.

Breeding birds

Habitat Loss

¹²⁷ <https://www.barnowltrust.org.uk/barn-owl-facts/barn-owl-adaptations/>

8.4.409 Once operational, there will be no further direct loss of habitats for breeding birds beyond that which occurred during the construction phase, and as habitat creation and enhancement measures establish, for generalist species and those that favour garden, woodland, hedgerow, scrub and wetland habitats, the Development is likely to provide a benefit in the long term. As such, the effects of habitat loss on breeding birds in the operational phase are **not significant**.

Killing or injury

8.4.410 During the operational phase of the Development, there is a risk of increased mortality to breeding birds as a result of increased predation by domestic cats, and road traffic collision.

8.4.411 Collectively, cat populations may kill very large numbers of prey. For example, Woods, McDonald & Harris (2003)¹²⁸ estimated that pet cats in Britain killed 25–29 million birds (alongside 52–63 million mammals and 4–6 million reptiles and amphibians) during a 5-month survey period. However, despite the fact that large numbers of prey are taken, the impact of cat predation on prey populations is equivocal with speculation remaining over whether cats simply take the 'doomed surplus' (particularly following the breeding season when numbers are highest due to recruitment into the population) rather than taking sufficient numbers of prey items to play a significant part in the decline of a species (Beckerman, Boots, & Gaston 2007¹²⁹). In addition, in urban and suburban habitats, populations of many species may be artificially elevated due to food provisioning by residents, and are thus possibly more robust to predation levels from cats, Whether or not cat predation can negatively impact on a population depends to some extent on whether mortality is compensatory in which case the animal would have died anyway from another cause, or additive, potentially having an adverse effect on the population.¹³⁰ Few studies have been carried out that specifically consider the effects of cat predation on avian populations in the UK; those that do appear to suggest that predation by cats is not of concern on a national scale but may be influential in the decline of local populations.

8.4.412 Domestic cat home ranges have been shown to be up to just under 7ha in studies of cat behaviour in Reading¹³¹¹³², although more typical ranges were in the region of just under 2ha. Cats hunt on instinct, irrespective of how well fed they may be. Approximately a quarter of households in the UK are thought to own at least one cat.¹³³ which, given the quantum of residential development, could mean c. 1000 cats, not accounting for households that own more than one. Increased predation from cats is likely to be significant at the local level given the proximity of residential housing to retained and created habitats of value to birds.

8.4.413 Deaths from traffic collision are most likely on the STC given that this is the most significant new road within the Site, and likely to carry the most traffic. Smaller, internal roads may also present some risk but these are unlikely

¹²⁸ Woods, M., McDonald, R.A. & Harris, S. (2003) Predation of wildlife by domestic cats *Felis catus*. Great Britain. Mammal Review, 33, 174–188

¹²⁹ Beckerman, A.P., Boots, M. & Gaston, K.J. (2007) Urban bird declines and the fear of cats. *Animal Conservation*, 10, 320–325.

¹³⁰ Floyd, L. (2013). Literature Review on the effects of cats on nearby protected wildlife sites. Unpublished report by Footprint Ecology for Breckland Council.

¹³¹ Thomas, R.L., Baker, P.J. & Fellowes, M.D.E. Ranging characteristics of the domestic cat (*Felis catus*) in an urban environment. *Urban Ecosyst* **17**, 911–921 (2014). <https://doi.org/10.1007/s11252-014-0360-5>

¹³² Hugh J Hanmer, Rebecca L Thomas, Mark D E Fellowes, Urbanisation influences range size of the domestic cat (*Felis catus*): consequences for conservation, *Journal of Urban Ecology*, Volume 3, Issue 1, January 2017, jux014, <https://doi.org/10.1093/jue/jux014>

¹³³ Murray, J.K., Gruffyd-Jones, T.J., Roberts, M.A., & Browne, W.J. (2015) Assessing changes in the UK pet cat and dog populations: numbers and household ownership *Veterinary Record*, Volume 177, Issue 10, September 2015, P259. <https://bvajournals.onlinelibrary.wiley.com/doi/full/10.1136/vr.103223>

to be significant causes of mortality. The A414 Breakspear Way, whilst it may carry more traffic during the operational phase when compared to baseline levels, is unlikely to present a significantly greater risk of mortality given the prior existence of the road and the relative paucity of suitable habitat alongside it. Likewise, mortality risks presented by B487 Hemel Hempstead Road (Redbourn Road) in the north are not anticipated to increase significantly from an unknown baseline.

- 8.4.414 In the absence of mitigation, the effects of killing or injury on breeding birds, primarily as a result of cat predation, are considered to be long-term. This would be negative at the local level and present a **moderate adverse** effect which is **significant**.

Disturbance

- 8.4.415 Retained hedgerows and woodlands are likely to be subject to greater levels of disturbance from residential, commercial and recreational activity, as well as from road noise than currently, particularly in areas with public access or in very close proximity to built form. However, the majority of species known to be present on the Site currently and which will likely continue to be accommodated by the proposals during the operational phase are not known to be particularly sensitive to disturbance, including species such as house sparrow, starling, dunnock, thrushes, house martin and swift, as well as a range of common and widespread 'garden' birds commonly living in urban and suburban areas, and in close proximity to people. Farmland specialists will be less likely to remain present on the Site due to the direct loss of habitat, such that disturbance is unlikely to be a cause of effect during the operational phase.

- 8.4.416 The effects of artificial lighting, for example from residential properties and street lighting on diurnal birds are not well understood; however, it has been seen to alter behaviours, including movement, foraging and vocal communication. It is not uncommon to hear songbirds singing late into the night, confused by the permanent twilight created by streetlights. This in turn can affect their activity levels and energy expenditure. Nocturnal species such as owls may find hunting more difficult in lit, urban areas and artificial light sources associated with urban areas can disrupt the natural movement patterns of birds migrating at night. However, given the scale of the Development and the species assemblage present, together with the extent of newly created habitat in the form of the Country and Valley Park and green corridors, much of which will remain unlit, it is not anticipated that effects would be evident at anything other than the site level.

- 8.4.417 As such, the effects of disturbance on breeding birds during the operational phase is considered to be negative at the site level only, which is **not significant**.

Raptors

Habitat loss

- 8.4.418 Once operational, there will be no further direct loss of habitats for raptors and owls beyond that which occurred during the construction phase. It is anticipated that generalist hunters such as buzzard, kestrel, owls and facultative scavengers such as red kite will continue to utilise the Site and the habitats created. There is, however, potential

for the proximity of nest sites to areas of new development to result in red kites opting to nest elsewhere in the vicinity, although some of these already tolerate high levels of activity in the form of human presence and/or traffic. While the potential losses of any nest site would be a negative effect, it is not considered significant enough to affect population levels of red kite locally given that the species is seeing a strong upward population trend (and are green-listed as a result) and because there is an abundance of alternative habitat in the wider landscape, particularly to the east and south.

8.4.419 The tree below which a deceased juvenile tawny owl was found will be retained. Whilst predominantly a broadleaf woodland species, tawny owls are often found in suburban habitats, such as gardens and parks, much more so than other species of owl, and it is anticipated that use of the (potential) nest site may continue once the Development is operational. Even in the worst-case scenario that the nest site was lost, there is ample habitat locally for this amber-listed species to thrive, and tree planting on the Site may eventually benefit the species in the longer-term.

8.4.420 As such, the effects of habitat loss on raptors in the operational phase is considered negative at the site level only and **not significant**.

Killing or injury

8.4.421 The risk of killing or injury of raptor species during the operational phase is largely confined to potential collision with road traffic; direct persecution is considered unlikely. The scale and importance of road casualties on raptors and owls is poorly understood, primarily due to a lack of systematic data gathering and general under reporting; however, species such as barn owl (see above), kestrel, tawny owl, sparrowhawk, buzzard and red kite are commonly affected, often as young birds or adults during the breeding season.¹³⁴

8.4.422 In several places, the STC bisects green corridors and areas of semi-natural habitat which may pose a risk to species that will likely hunt alongside it such as kestrel, red kite and barn owl (see above). The A414 Breakspear Way, whilst it may carry more traffic during the operational phase when compared to baseline levels, is unlikely to present a significantly greater risk of mortality compared to the current situation given the prior existence of the road and the relative paucity of suitable hunting habitat alongside it; however, effects are essentially unknown. Mortality risks presented by B487 Hemel Hempstead Road (Redbourn Road) in the north and A4147 Hemel Hempstead Road in the south may increase due to increases in traffic flows (as discussed in relation to potential effects upon bats) though new junctions and proposed speed limits could mitigate this affect to a degree. Deaths due to collisions with traffic on roads within the development is likely to be less given lower traffic flows and speed restrictions.

8.4.423 In the absence of mitigation, it is possible that the increased density of roads and greater traffic flow on existing roads may have a negative effect on raptors in the long-term at the site level which would be considered **not significant**.

¹³⁴ Hanmer, H.J., & Robinson, R.A (2021) Incidence of road mortality in ringed raptors and owls: a spatial analysis. BTO Research Report 733, BTO, Thetford, UK

Disturbance

- 8.4.424 Red kite was confirmed as breeding on the Site and in the immediate vicinity, as well as being widely present in the wider area.
- 8.4.425 As discussed above, known and potential nest-sites are all to be retained. The proximity to areas of development may make these sites less favourable for nesting purposes due to increased levels of human activity and noise disturbance, although it should be noted that some of these nest sites are located immediately adjacent to existing residential areas. While the potential displacement of birds from of any nest site would be a negative effect, it is not considered significant enough to affect population levels of red kite locally given that the species is seeing strong upward population increases (and have green-listed status) and because there is an abundance of alternative habitat in the wider landscape, particularly to the east and south.
- 8.4.426 Disturbance to foraging red kite, kestrel and buzzard is not considered significant during the operational phase given their propensity to utilise a wide range of habitats which will remain available to them on and off-site. Tawny owl, as a nocturnal hunter, may be susceptible to disturbance as a result of an increase in artificial lighting at the Site during the operational phase. A study by BTO in 2018/2019 showed that light pollution had a strong negative influence on tawny owl occupancy of an area. This is likely due to the adverse effects of artificial light on their small mammal prey, making less food available (BTO 2020).¹³⁵.
- 8.4.427 A Lighting Impact Assessment (**ES Volume 3, Appendix 8.14**) has been produced with measures targeted primarily at bats and badgers but will also benefit tawny owls and other nocturnal wildlife in preventing the illumination of key foraging and commuting habitat and potentially rendering it unsuitable in the long-term. However, this has not been considered embedded mitigation at this stage. In the absence of such mitigation the effects of disturbance on foraging and commuting owls is considered negative but only at the site level given that there is ample habitat within the wider landscape and the low number of birds likely affected. As such, this effect is considered **not significant**.

Wintering birds

Habitat loss

- 8.4.428 Once operational, there will be no further direct loss of habitats for wintering birds beyond that which occurred during the construction phase, and as habitat creation and enhancement measures establish, for generalist species and those that favour garden, woodland, hedgerow, scrub and wetland habitats, the Development is likely to provide a benefit in the long term. As such, the effects of habitat loss on wintering birds in the operational phase are **not significant**.

¹³⁵ <https://www.bto.org/sites/default/files/tocs-article-bto-news-spring-2020.pdf>

Killing or injury

8.4.429 As discussed for breeding birds, during the operational phase of the Development, there is a risk of increased mortality to wintering birds as a result of predation by domestic cats, and road traffic collision. Incidental mortality as a result of predation and traffic at a time of year when other natural causes of mortality are high (higher energy expenditure, lack of food resources, weather-related) is likely additive with the potential for a noticeable effect on numbers. On the other hand, it may be argued that for some species, winter numbers are 'artificially' bolstered by winter food provisioning by residents in gardens and thus populations are more robust than in the absence of such development.

8.4.430 On a precautionary level, and in the absence of mitigation, the effects of killing or injury on the wintering bird population are considered to be negative at the local level and present a **moderate adverse** effect which is **significant**.

Disturbance

8.4.431 During the winter months, birds are likely to be less sensitive to the effects of higher background levels of disturbance from increased human activity and companion animals, and road noise, when compared to during the breeding season when they may be sitting on eggs, rearing young or vocally communicating. In addition, as for breeding, the majority of species known to be present on the Site currently and which will likely continue to be accommodated by the proposals during the operational phase are not known to be particularly sensitive to disturbance, including species such as house sparrow, starling, dunnock, thrushes, house martin and swift, as well as a range of common and widespread 'garden' birds commonly living in urban and suburban areas, and in close proximity to people.

8.4.432 As discussed for breeding birds, the effects of artificial lighting on birds is not well understood and in the darker winter months, may allow for extended foraging which, in productive garden habitat, could offer some benefit at a time when energy requirements are high. Given the scale of the Development and the species assemblage present, together with the extent of newly created habitat in the form of the Country and Valley Park and green corridors, much of which will remain unlit, it is not anticipated that any negative effect would be evident at anything other than the site level.

8.4.433 As such, the effects of disturbance on wintering birds during the operational phase is considered to be negative at the site level only, which is **not significant**.

Summary of Significance of Effects During the Operational Phase

8.4.434 The assessment has concluded no significant effects to ecological receptors during the operational phase (in the absence of additional mitigation), apart from those shown in **Table 8.12** below.

Table 8.12: Summary of significant effects on ecological receptors during the operational phase

Receptor	Distance and orientation from Site	Impact Pathway / Significant effects
Westwick Row Wood LWS	On-site	Recreation – Significant (moderate adverse)
Nickey Way Dismantled Railway LWS	On-site	Recreation – Significant (moderate adverse)
Disused Railway Line Hemel Hempstead LWS	Adjacent	Recreation – Significant (moderate adverse)
Badger	-	Killing or injury – Significant (moderate adverse) Disturbance – Significant (moderate adverse)
Bats	-	Killing or injury – Significant (moderate adverse) Disturbance (light sensitive species) – Significant (major adverse)
Breeding bird assemblage	-	Killing or injury – Significant (moderate adverse)
Wintering bird assemblage	-	Killing or injury – Significant (moderate adverse)

8.5 Additional Mitigation/ Enhancement and Likely Residual Effects of the Development and their Significance

The Works

8.5.1 In the absence of mitigation, significant adverse effects have been identified on the Nicky Way Dismantled Railway LWS (moderate adverse - habitat loss); HPI hedgerows (moderate adverse – habitat loss); bats (moderate adverse – killing and injuring, and disturbance; and major adverse – habitat loss); and breeding birds (moderate adverse – habitat loss).

8.5.2 An Ecological Mitigation, Enhancement and Management Strategy (EMEMS) will be produced that will detail and secure all mitigation measures required to minimise impacts on biodiversity as set out below as well as the habitat creation and enhancement opportunities and their long-term management. This Strategy will incorporate the requirements of a Landscape and Ecological Management Plan (LEMP) and will be submitted for approval as one of the Pre-commencement Conditions.

8.5.3 An illustrative landscaping strategy has been prepared (not submitted for approval) and is included in the Design and Access Statement.

Nickey Way Dismantled Railway LWS

- 8.5.4 Detailed design will minimise the width of the STC to at the point that it crosses the Nickey Line to minimise the loss of hedgerows and trees.
- 8.5.5 The loss of all hedgerow or trees will be compensated for as part of the wider landscaping proposals and will be informed by the BNG assessment in due course. Planting schedules, densities, aftercare and long-term management of all planting across the Site will be set out within the EMEMS and LEMP. With regard to the LWS specifically, there is a commitment to contributing towards improvements to the Nickey Line to be delivered by the LPA as part of the travel plan. This would be in line with the specific aims and objectives of St Alban's City & District Council Nickey Line Greenspace Action Plan (GAP)¹³⁶ and Dacorum Borough Council's Greenspace Strategy¹³⁷, and through liaison with the Friends of the Nickey Line.
- 8.5.6 With the above measures in place, the integrity of the LWS will not be adversely affected in the long-term as a result of construction phase impacts. Any residual effects on the designated site will be mitigated to a negligible **(not significant)** level.

HPI Hedgerows

- 8.5.7 The detailed design will involve micro-siting infrastructure to further minimise losses of hedgerow wherever possible.
- 8.5.8 The loss of 5km of hedgerow will be compensated for as part of the wider landscaping proposals, to be approved at detailed design stage. The illustrative landscaping strategy demonstrates that it would be possible to include for the enhancement of 15.35km of HPI Hedgerow to species-rich native hedgerow with trees (in moderate or good condition) and creation of an additional 8.45km of species-rich native hedgerow (with trees (in moderate condition)).
- 8.5.9 The retained and created hedgerow will be managed under a 30-year management plan to make sure that it arrives at the intended condition of moderate or good. As part of this, it is assumed that all retained hedgerows will be enhanced in year 1. This will reduce the impact to a temporary adverse effect at the site level **(Not Significant)**, eventually becoming a long-term positive effect through mitigation. Details regarding the management of hedgerows will be outlined within Habitat Management and Monitoring Plan, associated with Biodiversity Gain requirements and as part of the LEMP/EMEMS to be secured by condition.

Bats

Killing / Injury & disturbance to roosting bats

- 8.5.10 Updated bat surveys will be conducted to inform reserved matters submissions for development phases as they come forward with reference to the Good Practice Guidelines. As previously referred to, EPS mitigation licences will need to be obtained from Natural England for any roosts identified and proposed to be lost, which will require

¹³⁶ [Nickey Line GAP 2022-27 \(compressed\).pdf](#)

¹³⁷ [en4-green-space-strategy-2011-low-res.pdf](#)

appropriate measures to avoid killing/injury to bats and avoid contravention of wildlife legislation. Appropriate working methods will also be adopted for works/felling of PRF-I trees (which do not require pre-planning surveys with reference to guidelines) including a precautionary working method statement and supervised felling with an appropriately licensed/experienced bat ecologist.

- 8.5.11 Demolition or significant/intrusive refurbishment of buildings with hibernation potential will be conducted outside of the bat hibernation period (November to March inclusive), unless surveys demonstrate the absence of roosting bats or appropriate working method statements and supervision can be demonstrated.
- 8.5.12 The CEMP outlines measures to minimise noise and vibration disturbance; however, the potential for noise and vibration during the works to disturb summer roosting and hibernating bats in buildings and trees remains. Updated surveys will be conducted to confirm the presence/absence and nature of roosting bats including the potential barbastelle roost within Westwick Row Wood and the woodland to the north, and wider buildings and trees associated with each development phase. Precautionary and reasonable disturbance avoidance measures will be proposed for works with high disturbance potential, such as piling, pneumatic drilling and compression rolling or works in close proximity to roosts. These measures may include adaptations to the working methods (e.g. alternative plant/machinery, routing or similar), works exclusion buffers, and/or timing and surveys immediately prior. For example, timing works around Westwick Row Wood to when bat activity is low and avoiding May, when evidence of a potential roost was recorded. These would be set out in a Protected Species Working Method Statement (PSWMS) and could be secured by condition. If an EPS licence is required from Natural England appropriate mitigation and compensation will be included therein.
- 8.5.13 In view of the above, residual adverse effects from the construction phase relating to the potential for injury/killing and disturbance to roosting bats during the works are considered likely **not significant**.

Habitat Loss/Creation – roosting habitats

- 8.5.14 Updated and comprehensive bat surveys will be conducted to inform detailed planning for development phases as they come forward with reference to the Good Practice Guidelines. EPS mitigation licences obtained from Natural England for any roost lost, will require appropriate roost replacement often on a like-for-like basis.
- 8.5.15 Overall there will be a presumption of retention of all trees and hedgerows (note those highlighted within the Arboricultural Impact Assessment (Appendix 8.16), as potentially requiring removal) including where within the development parcels, where loss is not reasonably required to deliver the scheme. This will minimise the loss of the existing tree roosting resource.
- 8.5.16 A range of bat roosting opportunities will be created to compensate for reductions in the overall roost resource where determined unavoidable from detailed designs. This will focus on the provision of high-quality roosting features and overall roosting resources, within areas such as the Country Park and Valley Park and will reflect the fact that bats will often utilise a range of tree roosting opportunities flexibly. It will be devised for each phase, in

consultation with a suitably qualified ecologist, with reference to guidance in the Bat Mitigation Guidelines (Collins 2023) and Hinds & Davidson-Watts (2022).¹³⁸ and provided as part of the EMEMS, to be secured by condition.

- 8.5.17 Where possible and appropriate, features of trees to be lost that have high bat roost potential will be cut out and secured onto trees that are to be retained in optimum locations. Where appropriate, new roost features will also be created as man-made arboreal features (dead wood, hazard beams) or through tree veteranisation. The siting and orientation of features will be targeted as appropriate to the wider potential roost features lost and in view of the post development landscaping, context (with a focus upon dark corridors/areas) and wider habitat connectivity.
- 8.5.18 Where artificial habitats are used, these will be varied in form, context and orientation with target species in mind, cognisant that bat boxes are generally favoured by pipistrelle bats above other species and often have a limited lifespan compared to arboreal features. They will include larger boxes with hibernation and maternity suitability and synthetic bark to provide roosting opportunities for barbastelle. Bat boxes/replacement roost features will be selected which are less likely to be used by birds and they will be monitored, cleaned out annually and replaced if damaged/lost. Additionally, planting schemes will incorporate early senescent fruit trees which typically develop suitable features sooner than other tree species, and often also support invertebrate prey species.
- 8.5.19 In addition to like-for-like replacement for lost roosts in buildings, provision of additional bat features to support a range of species will be integrated into buildings across the wider development. These bat boxes/bricks will be positioned within areas that allow them to face onto provided country parks/green spaces and in locations where they will have direct access to green corridors and minimal lighting lux levels. The exact location and ratio of bat features to buildings will be agreed with the LPA at detailed design stage and informed by updated surveys as relevant. To provide enhanced hibernation potential within buildings on site a range of features will also be included that provide suitable roosts for a range of species to use for hibernation purposes. This may include boxes such as the Schwegler 1FW Hibernation Bat Box which can support both maternity and hibernation colonies or may otherwise be built into ancillary infrastructure buildings.
- 8.5.20 As further enhancement, 2 x bat towers or wood store style bat lofts, will be created – one within the Country Park in the north, and one either within the Valley Park or associated with Blackwater Wood to the south. The type used will be determined based upon updated bat survey information at the time of creation and in view of the designs for the SANG areas. Designs will consider robustness against potential vandalism, and they will be sited in areas with fencing/scrub and other potential measures to restrict/exclude public access. These will maximise roosting opportunities for woodland bat species in appropriate habitats with a large resource of suitable foraging habitats within close proximity.

Habitat Loss/Creation, Fragmentation & Disturbance

- 8.5.21 Overall, there will be a presumption/commitment to the retention of all trees and hedgerows where loss is not absolutely required to deliver the scheme - including both inside and outside of development parcels, (see those

¹³⁸ https://cieem.net/wp-content/uploads/2025/03/InPractice118_Dec2022.pdf

highlighted within the Arboricultural Impact Assessment (Appendix 8.16), as potentially requiring removal). This will minimise the loss of foraging and commuting resources.

- 8.5.22 With reference to the supporting Biodiversity Gain Plan, retained habitats including woodland, grassland and hedgerows, will be enhanced. The Biodiversity Gain Plan demonstrates that at detailed design stage it would be possible that newly created habitats could include 34% of the Country Park comprising broadleaved woodland and 50% other neutral grassland; the Valley Park/southern SANG comprising approximately 20% broadleaved woodland and 55% other neutral grassland. Over 15km of existing hedge could be retained and enhanced and over 8km of new species-rich hedgerows could be created. A range of planting stock types will be used, including more advanced specimens (e.g., heavy and extra heavy standards) to provide a more established foraging and commuting resource from the outset and structural diversity.
- 8.5.23 Habitats will be lost and created in a staggered fashion as phases of the development come forward. Habitat loss will be delayed wherever possible and in particular, areas of the Country Park, Valley Park, associated SANG network, M1 bund and Valley Park will be created as early as possible within each development phase and prior to occupation, to minimise the associated establishment time and maturity of replacement habitats relative to loss. Landscaping within the Development will follow best practice guidelines and incorporate native species of local provenance and fruit, nut and seed-bearing species and species that support a range of invertebrates, such as willows and oaks.
- 8.5.24 A range of habitat types including wildlife ponds, SUDS features with permanent standing water and floodable meadows, allotments, and hedgerows with tall herbs and scrub will be created. Planting around greenspaces will look to also screen and reduce light spill on habitats from areas such as the playing fields, residential areas and road/street lighting. The landscape design and habitat management will be targeted to maximise biodiversity gains and promote bat flight activity towards areas of value to bats and away from areas of potential collision/disturbance risks.
- 8.5.25 With reference to the proposed 'Green Corridors', these will be delivered through the built development, leading into and through the green spaces to provide wildlife corridors. These will comprise hedgerows and tree lines, retaining and incorporating existing features wherever possible and augmenting them to form functional corridors for bats. Planting will focus upon continuous connectivity with minimal breaks and screening (to minimise illumination during operation).
- 8.5.26 In the north of the Site, the width of Wood End Farm Green Corridor will be maximised, retaining the existing hedgerow and linking Wood End Farm and the surrounding Country Park to Punchbowl Lane. A connected green corridor will run east from this, retaining the hedgerow leading to retained and enhanced woodland and tree lines in the north of the Country Park. Connectivity with Cherry Tree Lane/Spencer's Park will be maintained through edge planting along Lilly Lane.
- 8.5.27 In areas where existing vegetation that support bat commuting corridors are severed (such as the Nickey Line) vegetation removal and resulting gaps will be kept to the minimum possible. The gap should be temporarily bridged following hedge removal during the construction phase, with a movable bridging solution to maintain its

habitat connectivity in the interim. Where possible either side of the gap will be planted either with transplanted semi-mature trees or with extra heavy standards of fast-growing species, to minimise the extent and duration of severance effects on bats. Where possible existing hedgerows will be translocated to other areas to gap-up and connect valued habitats with reduced structural establishment time. Where habitats are temporarily severed during construction, (e.g., prior to establishment of hop-overs) temporary movable bat-corridor solutions will be employed.

- 8.5.28 Areas linking to off-site habitats to the north of the Site (between Redbourn Road Junction and the M1 motorway), and to the west (Spencer's Park, the SuDS basin and Cherry Tree Lane Community Garden) will be bolstered with habitat planting to promote wider connectivity.
- 8.5.29 In the centre of the Site, habitats associated with Hogg End Lane and Punchbowl Lane, which lead to existing underpasses under the M1 will be maintained and enhanced through widened structural planting providing additional shelter, shade and connectivity. These offer the potential to enhance east-west routes from Cherry Tree Lane, along Punchbowl Lane (which leads to the River Ver) and Hogg End Lane connecting habitats around Woodwell's cemetery, via the proposed Buncefield Park to land east of the M1 proposed for the creation of two new multi-value SuDS ponds and grassland. This will also potentially benefit the bat LWSs to the east of the M1 and associated with the wider Gorhambury Estate. The underpasses present potential opportunities for connectivity with woodlands at Gorhambury Estate for pipistrelle species, as indicated by the crossing point survey results. This will also likely maintain connectivity for barbastelle, noctule and serotine bats which are less restricted by roads when foraging and switching roosts.¹³⁹
- 8.5.30 The above would be detailed within an EMEMS outlining the habitat strategy associated with the northern and the southern areas of the Site that could be secured by condition. Specific planting and layout details would be outlined with the Masterplan and Landscaping Scheme for each phase of development.
- 8.5.31 In view of the above there is the potential for **non-significant** effects associated with the works phase relating to habitat loss, fragmentation and disturbance for the bat assemblage.

Breeding birds

- 8.5.32 The loss of arable farmland during the construction phase has been identified as having a significant (moderate adverse) effect on farmland birds, in particular skylark and other farmland specialists.
- 8.5.33 It is possible that the final Development may be able to accommodate one or two pairs of skylark within areas such as the Valley Park, depending on the exact nature and extent of the habitat creation there; however, skylark occupy large open fields to avoid predators and avoid nesting close to hedges and even isolated structures such as pylons, trees or bushes which might interfere with clear sightlines (Winspear & Davies 2005).¹⁴⁰ and the use of areas as

¹³⁹ Kerth, G. and Melber, M. Species-specific barrier effects of a motorway on the habitat use of two threatened forest-living species. *Biological Conservation*. Vol 142, Issue 2, February 2009, pp 270-279

¹⁴⁰ Winspear, R. & Davies, G. (2005) *A Management Guide to Birds of Lowland Farmland*. RSPB, Sandy, Bedfordshire.

SANG may not be compatible from a disturbance perspective. Therefore, on-site compensation is unlikely at any meaningful level for this species.

- 8.5.34 Appropriate mitigation will be in the form of off-site enhancements within the local area on land within The Crown Estate ownership, designed to increase carrying capacity and enable the habitat to support additional (displaced) pairs and/or boost productivity, for the foreseeable future. A farmland bird mitigation strategy for off-site land to be agreed with the HCC County Ecologist, will be developed as part of a wider Landscape and Ecological Mitigation, Enhancement and Management Strategy, to include the creation of skylark plots and a network of associated field margins of benefit to corn bunting, grey partridge, yellow hammer and wider species. This is expected to be secured by pre-commencement condition.
- 8.5.35 The timing of the provision of off-site compensation should align with the phased loss of on-site habitat. Where possible, the plots should be delivered in advance of habitat clearance such that there is no temporary shortfall in nesting and foraging habitat for the local population.
- 8.5.36 Although it is not considered that the loss of nesting and foraging habitat of more generalist species on Site, or of those species present only in low numbers, will result in a significant effect on local populations, site-level effects will occur. Artificial nest-features will be incorporated into landscaping plans to provide a suite of opportunities both during construction (in retained habitat not subject to disturbance) and post-development. These will include a range of bird boxes suitable for cavity-nesting species known to be in the area and/or Species of Principal Importance, and features such as house martin cups and swift boxes, particularly where existing buildings with the potential to support these species are lost to demolition.
- 8.5.37 These measures would be detailed as part of the EMEMS, to be secured by condition.
- 8.5.38 With the above measures in place, residual effects on breeding farmland birds from habitat loss will be mitigated to the Site (**not significant**) level.

The Completed and Operational Development

- 8.5.39 In the absence of mitigation, significant adverse effects have been identified on Westwick Row Wood LWS (moderate adverse – recreational disturbance and urban effects); the Nickey Way Dismantled Railway LWS (moderate adverse – recreational disturbance and urban effects); Disused Railway Line, Hemel Hempstead LWS (moderate adverse – recreational disturbance and urban effects); Kettlewell's Farm Area LWS (moderate adverse – light disturbance, bats); Gorhambury Cottage Area LWS (moderate adverse – light disturbance, bats); Gorhambury Icehouse LWS (moderate adverse – light disturbance, bats); Temple Cottage Area LWS (moderate adverse – light disturbance, bats); badger (moderate adverse – killing or injury and disturbance); bats (moderate adverse for both common pipistrelle and barbastelle – killing or injury; and major adverse for sensitive species such as barbastelle, brown long-eared bats and myotis in particular – disturbance); barn owl (moderate adverse – killing or injury); breeding birds (moderate adverse – killing or injury); raptors (moderate adverse – killing or injury); and wintering birds (moderate adverse – killing or injury).

8.5.40 An illustrative landscaping strategy has been prepared (not submitted for approval) and is included in the Design and Access Statement. This demonstrates how the mitigation referred to below could be achieved at the detailed design stage.

Westwick Row Wood LWS

8.5.41 Owing to the proximity of the woodland to areas of residential development, there is a risk that public access may cause damage and degradation to the ancient woodland and ground flora within the LWS. The woodland is also known to support nesting red kites (see below) of which it is an offence to disturb during the breeding season.

8.5.42 It is therefore proposed that direct access is restricted to the woodland through the use of perimeter post and rail fencing and where possible planting of continuous and dense thorn-bearing hedge species. This will deter the casual use of the woodland by residents and visitors to the Development for recreational purposes and reduce the risk of detrimental urban effects such as littering and vandalism, whilst not impeding access to species such as badger. Gardens will not directly back onto the woodland to reduce the risk of garden waste being dumped over property boundaries. These measures would be detailed as part of the EMEMS, to be secured by condition

8.5.43 An outline Lighting Impact Assessment has been produced and is appended to this Chapter (**ES Volume 3, Appendix 8.14** - Greengauge 2025). This includes potential mitigation solutions in respect of lighting, to be considered at detailed design stage, to make sure lighting required for public health and safety purposes does not result in light spill onto the woodland which might adversely affect nocturnal wildlife such as badgers and bats. For example the use of in-ground waymarking luminaires using warmer light tones (2300-2700K wherever possible) to delineate nearby path edges where there is a risk of light spill, and the use of other mitigative measures including consideration of part-night lighting and vegetative screening to reduce light spill to no more than 1 lux in line with BCT/ILP guidance. The detailed lighting design will be produced for approval as part of future reserved matters submissions.

8.5.44 With the above measures in place, residual effects on Westwick Row Wood LWS from recreational disturbance and urban effects will be mitigated to a negligible (**not significant**) level.

Nickey Way Dismantled Railway LWS

8.5.45 The Nickey Line is a vital component of the green infrastructure network. As a sustainable transport route it encourages people to be physically active, reduces the pressure on the road system and provides a recreational activity. Usage of the route has steadily increased over the years, and the Development will increase usage further.

8.5.46 The Vision Statement of the Nickey Line GAP is for the route to be a corridor for wildlife and people, with vegetation managed to promote a diverse range of habitats, and people able to use the route for leisure and also as an off-road transport connection between Hemel Hempstead, Redbourn and Harpenden.

8.5.47 The Friends of the Nickey Line are active in carrying out management of the LWS through their volunteer work parties, as well as sourcing funding towards management and improvement projects.

8.5.48 As is evident from the above, the Nickey Line is a valued community asset as well as a valuable wildlife habitat. The GAP sets out a number of aims and objectives to make sure increasing public use of the route is commensurate with its ecological function. These include provision of bins to manage litter, interpretation boards to communicate and educate the public as to the ecological value and history of the route, paths surfacing to improve accessibility and which will also reduce erosion and vegetation trampling, and the management of hedgerows – in some sections (such as that alongside the Site), this may involve opening up overmature and encroaching sections, and in others, supplementary planting and infilling.

8.5.49 The outline Lighting Impact Assessment (**ES Volume 3, Appendix 8.14**) includes potential mitigation solutions that could be used to minimise disturbance to bats and badgers from artificial lighting. A detailed lighting design will be produced with reference to the BCT/ILP guidance in order to minimise illumination of the Nickey Line and will be submitted for approval as part of future reserved matters submissions.

8.5.50 With the above measures in place, residual effects on the Nicky Way Dismantled Railway Line LWS from recreational disturbance and urban effects will be mitigated to a negligible (**not significant**) level.

Disused Railway Line, Hemel Hempstead LWS

8.5.51 The potential recreational and urban effects arising as a result of increased usage of the Nickey Line within the Disused Railway Line, Hemel Hempstead LWS will be mitigated as per the above. With these measures, residual effects on the Disused Railway Line LWS from recreational disturbance and urban effects will be mitigated to a negligible (**not significant**) level.

Kettlewell's Farm Area LWS, Gorhambury Cottage Area LWS, Gorhambury Icehouse LWS and Temple Cottage Area LWS

8.5.52 The outline Lighting Impact Assessment (**ES Volume 3, Appendix 8.14**) provides potential mitigation options to minimise/avoid illumination of valued foraging, commuting and roosting habitats. A detailed lighting design will be produced with reference to the BCT/ILP guidance and will be submitted for approval as part of future reserved matters submissions

8.5.53 With the above measures in place, residual effects on foraging and commuting bats associated with these LWS remains negligible and **not significant**.

Badger

Killing or injury

8.5.54 To further minimise the risk of road-related mortality, traffic calming measures such as speed bumps, rumble strips, road narrowing or chicanes will be installed at key crossing points (such as where the STC bisects green corridors). Dense low vegetation such as scrub will not be allowed to encroach onto verges immediately adjacent to the carriageway at these locations to allow motorists better sight of any animal waiting to cross. Vegetation and/or fencing will, however, be used to guide animals to the underpasses.

- 8.5.55 Artificial setts will not be located in areas with high public footfall but will be discretely set within undisturbed areas and away from pathways. Where necessary, defensive planting (dense scrub and thorny species) will be used to discourage people and dogs straying from the paths in these areas.
- 8.5.56 The Lighting Impact Assessment and detailed strategy will make sure that newly created and retained habitats, including artificial setts, retained setts, foraging and commuting habitat and underpasses (and the approaches to them) are not subject to high levels of artificial illumination. With the above measures in place, residual effects on badgers from killing or injury, disturbance from public and dogs and light disturbance will be mitigated to a negligible (**not significant**) level.

Bats

Killing/injury

- 8.5.57 The killing or injury of bats from increased cat predation may be best mitigated for by the installation of features to prevent/deter cats from being able to access known roost locations and locating new and replacement roosts in areas which are inaccessible. Defensive planting between residential areas and retained habitat may help deter cats and reduce access in these areas. Specific features such as downward facing collars on trees and buildings will also prevent access at specific locations. As habitats of high value for bats establish, it is anticipated that the carrying capacity of the Site will also increase, making the population more resilient.
- 8.5.58 The potential for road collision risks may be mitigated for some bat species by the use of hop-overs, whereby bats are encouraged to maintain or increase their flight height before crossing roads. Hop-overs are not considered to be effective for low-flying and highly manoeuvrable species such as BLE¹⁴¹, however pipistrelle and barbastelle bats have been observed to cross over two-lane roads at safe heights at road sections with a connecting tree canopy above the road^{142, 143, 144} and there is a positive correlation between the height of road verges and flight height of bats when crossing the road^{143, 145, 146}. This suggests that ramps or embankments along roads could reduce collision risk if bats maintain a high flight-height above traffic while crossing roads¹⁴¹. Recent research however, reported an increased risk of collision for barbastelle bats on roads where woodland edge habitats are present along the road edge, which it concluded could mean greater mortality risks to barbastelle at hop-overs. However, bats were more likely to directly cross the road when the mean canopy height was greater suggesting that a taller canopy offers greater protection, leading bats to cross more directly potentially avoiding the risk of flying along the road¹⁴⁷.

¹⁴¹ Elmeros, et al., 2016 CEDR Fumbling in the dark – effectiveness of bat mitigation measures on roads – Final report

¹⁴² Kerth G. & Melber M. (2009) Species-specific barrier effects of a motorway on the habitat use of two threatened forest-living bat species. *Biological Conservation*, 142, 270-279.

¹⁴³ Lüttmann et al. 2011

¹⁴⁴ Nowicki F, Authur L, Dorey J, Rael V & Rousselle K 2016. Guide méthodologique. Chiroptères et infrastructures de transport. Centre d'études et d'expertise sur les risques, l'environnement, la mobilité et l'aménagement (CEDEMA)

¹⁴⁵ Berthinussen, A., & Altringham, J. (2012). The effect of a major road on bat activity and diversity. *Journal of Applied Ecology*, 49(1), 82-89. <https://doi.org/10.1111/j.1365-2664.2011.02068.x>

¹⁴⁶ Pickard J 2014. Llanwnda to south of Llanllyfni Improvement—Assessment of Longer Term Implications on European Sites. Hyder Consulting (UK) Limited-2212959.

¹⁴⁷ Omally K. D., Scholfield, H. W., Wright P. G.R., Hargreaves D., Corcoran A. J., Mathews, F. (Ovetober 2025 Increasing canopy cover elevates vehicle collision risk for barbastelle bats (*Barbastella barbastellus*) at roads, *Sci Rep* 15, 37011 (2025)

- 8.5.59 In view of the small number of HDVs (meaning collision risks would be mainly below 2m only), the limited extent of the operational gap (<13m) associated with the STC, and the limited width of the Nickey Line, meaning the extent of vegetation surface bordering the road (meaning foraging and flight parallel along the road edge would be less likely) a hop-over solution is considered relevant to reduce collision risks in this location for pipistrelle and barbastelle. Dense and increasing vegetation height leading up to the crossing with extra heavy standards of fast-growing species should be used (or alternative as advised by a landscape architect) to gain tall growth quickly and canopy continuity upon maturity. Landscaping should further look to reduce woodland edge habitats that might promote foraging activity along the STC. The use of further design mitigation incorporated into the crossing should also be applied as relevant, including the potential use of an earth bund (e.g., >2m) to increase flight height / reduce the road height in comparison to the edges and/or the use of fencing/screens. This should be informed by further research/evidence/guidance and updated surveys at the time of the relevant development phase.
- 8.5.60 The use of hop-overs and screening at road edges would also be investigated/employed at wider locations along the STC and throughout if traffic collisions for bats are considered to present a notable risk at the detailed design stage for each phase as it comes forward. Traffic calming, speed restrictions, minimised lighting (e.g. the use of red light) in favourable crossing locations and the incorporation of hop-over(s) to promote safe passage for bats will be considered as relevant as part of the design solutions. Habitats will be designed and managed for biodiversity gains and to direct bats towards safe areas with reduced collision risks. Habitats will be designed and managed to reduce their value to bats (e.g. amenity grassland with more frequent mowing regimes) in areas bordering the STC and wider roads, where the passage of bats is to be deterred, with planting targeted to redirected bats to safer crossing areas. Details regarding the proposed bat commuting corridors and traffic collision risk solutions would be detailed within an EMEMS and could be secured by condition.
- 8.5.61 Additionally to the above, the proposed creation of extensive areas of foraging and roosting habitats of high foraging value to bats will increase the size and resilience of populations of bats on the site in the medium-long term, once established.
- 8.5.62 In view of the above mitigation residual effects upon bats relating to killing and injury are considered to be **not significant**.
- Disturbance & habitat severance
- 8.5.63 Measures for ideal locations and types of bat roost are as per those described in Section 8.5.12. In addition, for the operational phase of the Development they should be located in areas where they can be protected from deliberate damage/vandalism. Any structure designed for use by bats should be made as resistant to damage by vandalism as possible. Doors can be reinforced and sited some way above ground level to make it difficult to damage them; rainwater goods can be carried internally; flammable materials that can be reached from ground level should be avoided.
- 8.5.64 As outlined in the LWS sections above, public access will be excluded from Westwick Row Wood and the woodland in the north. Additionally, the new roosting locations, including bat houses will be in areas away from paths, with public access restricted/deterred.

- 8.5.65 Updated bat surveys will be conducted in support of detailed designs and will be used to inform the lighting strategy for each phase of development as it comes forward. Lighting strategies will be devised in consultation with a bat ecologist. Throughout, artificial lighting will not be used in areas of value to bats, unless necessary. Where necessary, lighting will be minimised. The use of light frequencies of potential disturbance to bats will be avoided where possible and light spill will be minimised through lighting designs. Lighting on and around buildings will be designed to avoid/minimise illumination of known/replacement roost features and connected habitats that provide foraging and commuting connection into the wider landscape. This will minimise the potential for disturbance to roosting bats in buildings.
- 8.5.66 The outline Lighting Impact Assessment (**ES Volume 3, Appendix 8.14**) provides potential mitigation solutions to minimise/avoid illumination of valued foraging, commuting and roosting habitats. A detailed lighting design will be produced with reference to the BCT/ILP guidance and will be submitted for approval as part of future reserved matters submissions.
- 8.5.67 Further surveys will be conducted to confirm the presence/likely absence of a barbastelle roost in Westwick Row Wood including backtracking/vantage point surveys to determine the nature of bat activity to/from the wood. If the presence of a barbastelle roost (or other equally high value conservation value roost(s)) is confirmed in Westwick Row Wood then appropriate disturbance and connectivity measures will be incorporated into the detailed design. This will include:
- An appropriate buffer around the woodland including trees and scrub to deter access, increase foraging and buffering of habitats and screen against light spill.
 - Retention/enhancement/creation of flight corridors to and from the woodland to preserve commuting activity to existing and newly created on Site and off-Site foraging and commuting resources.
 - Avoidance/minimisation of lighting and noise disturbance on the wood and associated flight corridors with appropriate buffer distances from sources of disturbance.
 - This will form part of an extend and enhanced green buffer along Westwick Row (Quietway) leading to the additional entrance into the Valley Park to the east and along Westwick Row to Hemel Hempstead Road.
- 8.5.68 Where possible hedgerows will be managed to maximise opportunities for biodiversity and wildlife with rotational, low-frequency cuts to promote tall and bushy hedge growth and associated hedge-bottom flora. Where direct recreational use does not necessitate otherwise, grassy areas will be subject to relaxed mowing regimes to promote structural and species diversity of value to invertebrate prey species. Native species of local provenance will focus on invertebrate supporting and fruit bearing species, including early senescent fruit trees.
- 8.5.69 As part of the EMEMS a Dark Corridors Plan will be provided outlining proposed commuting and foraging corridors for bats supported by a relevant lighting strategy demonstrating how this will be achieved.
- 8.5.70 Overall, the mitigation strategy will include light exclusion zones to form interlinked dark corridors throughout the Site –including the Country Park, Valley Park, Westwick Row Wood and the network of green corridors and hedgerows which link these areas incorporating retained areas of existing value.

8.5.71 Subject to the above mitigation residual disturbance effects upon roosting bats are considered to be **not significant**.

Barn owl

Killing or Injury

8.5.72 It is proposed to erect a barn owl box in an established hedgerow with trees close to Bedmond Road, a C-class road to the south of the Site and four to the east of the M1 in suitable habitat along the River Ver within the same land ownership. These will serve to provide alternative nesting sites away from the M1 motorway which currently presents a risk of killing or injury due to its proximity. They will also serve as compensation for any loss of the existing nest site, should operational use of the surrounding land not favour continued use. With the above measures in place, residual effects on barn owl from killing or injury associated with road traffic accidents will be mitigated to a negligible (**not significant**) level.

Breeding birds

8.5.73 Cat predation of birds within a residential development is notoriously difficult to mitigate. Measures such as cat-proof fencing is not practical or desirable across wide areas for financial and aesthetic reasons, especially when the significance of the effect of predation at a population level is somewhat equivocal. Restrictions on cat ownership, keeping cats indoors at night or the wearing of collars with anti-predation devices are hard to enforce. Instead, there will be a focus on creating a diversity of high-quality nesting and foraging habitat across the Development to bolster numbers and provide resilience to the population. This will be located not only within the Country and Valley Parks and green corridors, but also within communal areas, edge and landscape buffers where soft landscaping is proposed, and will supplement that which is already present and being retained within hedgerows and woodland on-Site.

8.5.74 A variety of bird boxes suitable for a range of cavity-nesting species will be provided on buildings and retained trees throughout the Development with scrub and native shrub planting as part of the landscaping proposals providing opportunities for scrub-nesters. A range of fruit, berry and seed-bearing species, as well as those that support a diversity of invertebrate prey, will be chosen to provide diverse foraging opportunities to increase population resilience.

8.5.75 Defensive planting using thorny or dense scrub will also be used along edge habitats between residential areas and the parks and green corridors wherever possible. All details of the proposed planting schedule, densities, aftercare and long-term management of the planting will be set out within the EMEMS and LEMP.

8.5.76 With the above measures in place, residual effects on breeding birds from killing or injury (cat predation) will be mitigated to the Site (**not significant**) level.

Wintering birds

8.5.77 As for breeding birds above, and due to the difficulties in mitigating directly, there will be a focus on creating a diversity of high-quality roosting and foraging habitat across the Development to bolster numbers and provide resilience to the population, as well as defensive planting between residential areas and greenspaces where it is likely to be of value. The wider planting schedule for the Site will include fruit, berry and seed-bearing species of value to wintering birds with areas of grassland sown with seed species of high nutritional value to wintering birds.

8.5.78 With the above measures in place, residual effects on wintering birds from killing or injury (cat predation) will be mitigated to the Site (**not significant**) level.

Additional measures – legal compliance

8.5.79 Although significant effects on great crested newts, reptiles and individual nesting birds are not anticipated during the operational phase of the Development, there will, nonetheless, be a need to make sure that any post-development habitat management and site maintenance works do not result in the contravention of the relevant conservation legislation, particularly if the status of these species on Site changes as a result of favourable habitat creation and enhancements in the future. Measures to be taken to make sure there is no risk of an offence will be set out within the EMEMS and LEMP elements.

Great crested newt

8.5.80 Great crested newts have not been recorded on Site during surveys but habitats with the potential to support them are present within the Site boundaries. If recorded during the construction phase an EPS License will likely be required that would detail how management and maintenance should be undertaken in appropriate areas. This would include measures such as sensitive timing and methods of works for e.g., grassland cutting, scrub removal and pond maintenance works. More generally, the EMEMS will include appropriate habitat management measures to maximise opportunities for amphibians, including GCN, and to minimise the potential for harm to amphibians during habitat management and maintenance works as the site becomes more suitable for them.

Reptiles

8.5.81 Reptiles have not been recorded on Site during surveys but habitats with the potential to support them are present within the Site boundaries. As such, it cannot be discounted that very low numbers of common and widespread reptiles are present, and that habitat creation at the Site may increase its suitability and populations. Reptiles such as grass snake, adder, slow worm and common lizard are protected from killing and injury under the Wildlife & Countryside Act 1981 (as amended).

8.5.82 The risks to reptiles are as above for great crested newts and precautionary measures outlined for these will also serve to minimise the potential for killing or injury of reptiles during habitat management and maintenance operations during the operational phase as the site becomes more suitable for this species group.

Nesting birds

8.5.83 All wild birds and their active nests (including those in the process of being built) are legally protected under the Wildlife & Countryside Act 1981 (as amended). Measures that will be set out within the EMEMS to make sure that individual birds are not killed or injured and their nests not damaged or destroyed during routine habitat management and maintenance operations during the operational phase include the clearance of suitable habitat outside of the main bird breeding season (typically March to August inclusive.¹⁴⁸) and pre-works checks or surveys prior to clearance during other times, as well as the establishment of suitable buffer zones around any nests that may be found. Where vegetation clearance is not possible outside the main bird breeding season, works will be supervised by a competent ecologist following the pre-works check.

8.6 Likely Residual Cumulative Effects and their Significance

8.6.1 The following schemes were included in the assessment of cumulative effects (Planning Application Reference DBC - Dacorum Borough Council, SADC - St Albans District Council):

- Land At Green Lane, Hemel Hempstead, Hertfordshire (DBC: 21/03793/MOA);
- Land Between Three Cherry Trees Lane And Cherry Tree Lane, Hemel Hempstead (DBC: 4/02539/16/MOA, SADC: 5/2016/2845);
- Land At Eastman Way, Atlas Copco, Hemel Hempstead Industrial Estate, Swallowdale Lane, Hemel Hempstead, Hertfordshire, HP2 7DU (DBC: 22/03812/MFA);
- St Stephens Green Farm, Chiswell Green Lane, St Albans, Hertfordshire (SADC: 5/2021/3194);
- Land South Of Chiswell Green Lane, St Albans, Hertfordshire (SADC: 5/2022/0927);
- Land To Rear Of Burston Garden Centre North Orbital Road Chiswell Green, St Albans, Hertfordshire (SADC: 5/2020/3022);
- Land in and around former aerodrome, north orbital road, Upper Colne Valley, Hertfordshire (SADC: 5/2009/0708);
- LA3, Land At West Hemel Hempstead (DBC: 4/03266/18/MFA);
- Land Between Caravan Site And Watling Street Park Street, St Albans, Hertfordshire (SADC: 5/2022/0267);
- Land To Rear Of 112-156B Harpenden Road, St Albans, Hertfordshire (SADC: 5/2021/0423);
- Copsewood, Lye Lane, Bricket Wood, Hertfordshire (SADC: 5/2023/0983);
- Land Between Three Cherry Trees Lane And Cherry Tree Lane, Hemel Hempstead (SADC: 5/2024/0927);
- Land At Gaddesden Lane, Redbourn, Hertfordshire, AL3 7DP (SADC: 5/2021/3631);
- Land At Marchmont Farm Piccotts End Lane, Hemel Hempstead, Hertfordshire, HP2 6JH (DBC: 19/02749/MOA);

¹⁴⁸ Newton, J., Nicholson, B., Saunders, R., Willets, R. & Venables, R. (2011) Working with wildlife: guidance for the construction industry (2nd Ed.). CIRIA, London.

- Land West Of Leighton Buzzard Road And North Of Galley Hill, Leighton Buzzard Road, Hemel Hempstead Hertfordshire, HP2 (DBC: 21/04508/MOA);
- Former British Gas Site London Road Hemel Hempstead Hertfordshire (DBC: 25/00549/MFA);
- Land at Cooters End Lane and Ambrose Lane, Harpenden (SADC: 5/2023/0327);
- North Hemel Hempstead Development Site Hemel Hempstead Road Redbourn Hertfordshire (SADC: 5/2025/0645);
- Proposed Solar Farm, Potters Crouch, Hertfordshire (SADC: 5/2025/0733);
- Land Off Sandridgebury Lane And Between The Railway And Harpenden Road St Albans Hertfordshire (SADC: 5/2024/2271); and
- Westwick Row, Land to the South of Green Lane (Draft allocation).

8.6.2 Bricket Wood Sports and Country Club, Paintball Site and Bricket Lodge, Lye Lane Bricket Wood, Hertfordshire, AL2 3TF (SADC: 5/2022/2443), located 5km to the south-east of the Development, was refused at appeal on 3 June 2025. As such, it has been excluded from the cumulative impact assessment.

8.6.3 Plots 1 & 2, Maylands Avenue, Hemel Hempstead, HP2 4FQ (DBC: 21/04556/MFA), located approximately 830 m west of the Development, was withdrawn on 1 October 2025. Therefore, it has been excluded from the cumulative impact assessment.

7.1.1 Based on the information currently available, the Development, in combination with all other identified developments, is not expected to result in any significant cumulative effects on ecological receptors during the Works or in the long term. Each of the cumulative developments considered in this assessment is discussed below.

Land At Green Lane, Hemel Hempstead, Hertfordshire

8.6.4 The consented scheme is located 10m to the west of the Development. The proposals are of commercial nature and therefore there will be no predicted recreational impacts on ecological features. No badger setts were recorded on site; however, a single latrine was observed during the 2019 surveys, indicating occasional use of the site by badgers.¹⁴⁹ The site is 6.5ha and comprises mostly semi-improved grassland suitable for badger foraging. As a result, the proposals, which are under construction, will lead to a reduction in available foraging habitat for this species with approximately 50% of the semi-improved grassland within the red line boundary being lost.¹⁵⁰ However, given that that the Development will not result in significant effects to badgers arising from habitat loss and fragmentation, in combination impacts are also considered to be **not significant**.

Land Between Three Cherry Trees Lane And Cherry Tree Lane, Hemel Hempstead (DBC: 4/02539/16/MOA, SADC: 5/2016/2845);

¹⁴⁹ Ecology Solutions. Ecological Assessment. Green Lane, Maylands Gateway, Hemel Hempstead. 2021

¹⁵⁰ Ecology Solutions. Biodiversity Net Gain Report. Green Lane, Maylands Gateway, Hemel Hempstead. 2021

8.6.5 This scheme on land allocated within the St Albans and Dacorum Local Plan, is located adjacent to the Development's western boundary and is under construction. An Environmental Impact Assessment was completed in 2016.¹⁵¹ and updated with an addendum in 2017.¹⁵² which concluded that there will be negligible residual effects, in isolation or cumulatively with other developments, on ecological features, including designated sites (N.B. only examined to a radius of 5km from Site) and protected species. As an allocated site, effects on Chilterns Beechwoods SAC which lies beyond the 5km radius used in the EIA will also have been considered as part of the SADC draft Local Plan HRA (2024) which concluded significant effects from air pollution were unlikely in-combination with predicted growth across the plan area, but that cumulative recreational effects will require appropriate mitigation.

8.6.6 The scheme includes for some green infrastructure, including grassland and woodland planting and management and traditional orchard and public open space and sports facilities though there was no formal on-site SANG provision. A reserved matters application (appearance, landscaping, layout, scale) of this outline planning permission is currently pending (see Land Between Three Cherry Trees Lane And Cherry Tree Lane, Hemel Hempstead SADC: 5/2024/0927 below) where cumulative effects are considered further.

Land At Eastman Way, Atlas Copco, Hemel Hempstead Industrial Estate, Swallowdale Lane, Hemel Hempstead, Hertfordshire.

8.6.7 The consented scheme lies 1.4km west of the Development. The proposals for this scheme are of commercial nature and therefore there will be no predicted recreational impacts on ecological features. The Ecological Assessment.¹⁵³ of the Site concluded that the scheme will have no significant effect on ecological features and therefore **no significant** cumulative effects are considered likely.

St Stephens Green Farm, Chiswell Green Lane, St Albans, Hertfordshire

8.6.8 This scheme is located 2.5km south-east of the Development. An Environmental Impact Assessment (EIA) was not required for this application. The scheme, which has been consented, includes 300 new homes. While the site includes approximately 0.35ha of open space and a further 1.6ha of park area, these are not designed as a SANG. As such, the proposals could, theoretically, contribute to cumulative impacts on ecological receptors sensitive to increased recreational pressure and air quality such as Chilterns Beechwoods SAC when considered alongside the Development, although risks in relation to the SAC are unlikely given that the development site lies outside the 12.6km recreational Zol around the designated site. However, the Development itself is assessed as having no significant direct effects on these receptors. Therefore, cumulative effects are not considered likely. The ecology survey report assessed the site to be of negligible suitability for protected species, with the exception of nesting birds where significance of effects after mitigation was assessed as being negligible.¹⁵⁴

Land South Of Chiswell Green Lane, St Albans, Hertfordshire

¹⁵¹Wardell Armstrong. Spencers Park Phase 2 Environmental Statement Volume 1 Section 8.0 Ecology and wildlife. 2016

¹⁵² Wardell Armstrong. Spencers Park Phase 2 Environmental Statement Addendum; Chapter 8 Ecology and Wildlife. 2017

¹⁵³ Middlemarch. Preliminary Ecological Appraisal Land at Eastman Way, Hemel Hempstead.2022

¹⁵⁴ Cherryfield Ecology. Ecology Report Chiswell Green Lane and east of The Croft, Chiswell Green, AL2 3AJ. 2021

8.6.9 The Ecological Impact Assessment¹⁵⁵ for this scheme, which is located 3km south of the Development, concluded that there will be negligible effects on ecological features, including designated sites and protected species. The development site lies outside the 12.6km ZoI around Chilterns Beechwoods SAC. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land To Rear Of Burston Garden Centre North Orbital Road Chiswell Green, St Albans, Hertfordshire

8.6.10 The scheme is located 3.5km south-east of the Development on land allocated within St Alban's Local Plan. The Preliminary Ecological Appraisal did not identify any significant effects on designated sites within 2km of the scheme, protected species and habitats.¹⁵⁶ Given that the proposals are for assisted living apartments and bungalows intended for retired individuals, it is considered unlikely that future residents will be highly mobile or regularly undertake visits to designated ecological sites such as Chilterns Beechwoods SAC. In addition, the development site lies beyond the 12.6km ZoI for the SAC. As such, the risk of increased recreational pressure and air quality on receptors sensitive to disturbance is expected to be low, and the proposals are unlikely to result in significant impacts. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land in and around former aerodrome, north orbital road, Upper Colne Valley, Hertfordshire

8.6.11 The Ecological Impact Assessment for this scheme, which is located 4.6km south-east of the Development, concluded that there will be negligible effects on ecological features, including designated sites, habitats and protected species.¹⁵⁷ Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

LA3, Land At West Hemel Hempstead

8.6.12 The Environment Impact Assessment for this scheme, which is located 5.8km west of the Development on land allocated within the Local Plan concluded that there will be negligible effects on ecological features, including designated sites and protected species.¹⁵⁸ The bat assemblage using the site for foraging and commuting was considered to be important at the Local level, given the habitats present and the diversity of bat species recorded at the site including barbastelle and Nathusius's pipistrelle, although in extremely low numbers. Navigational corridors through and around the site will be available for bats throughout the construction and operational phase of the development. The provision, enhancement and creation of freshwater, grassland, woodland and linear features at the site, alongside a sensitive lighting scheme, will make sure bats continue to make use of the Site for foraging and commuting throughout the operational phase of the development. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land Between Caravan Site And Watling Street Park Street, St Albans, Hertfordshire

¹⁵⁵ The Ecology Partnership. Ecological Impact Assessment. Land south of Chiswell Green Lane, St Albans, Hertfordshire. 2022

¹⁵⁶ RPS. Burston Garden Centre, St Albans Preliminary Ecological Appraisal. 2020.

¹⁵⁷ EPR. Environmental Statement Part III Chapter 5 Ecology: Land in and around former Aerodrome. 2010.

¹⁵⁸ CSA Environmental. Environmental Statement Land at West Hemel. Chapter 7. 2019

8.6.13 The Preliminary Ecological Assessment for this scheme, located 830m to the north of the Development, described the on-site habitats as being of low ecological value at site level, and concluded that there will be negligible effects on ecological features. The development site lies beyond the 12.6km ZoI around Chilterns Beechwoods SAC. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land To Rear Of 112-156B Harpenden Road, St Albans, Hertfordshire

8.6.14 The Ecological Appraisal for this scheme, located 5.1 km east of the Development, concluded that there will be negligible effects on ecological features, including designated sites, habitats and protected species.¹⁵⁹. The development site lies beyond the 12.6km ZoI around Chilterns Beechwoods SAC. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Copsewood, Lye Lane, Bricket Wood, Hertfordshire

8.6.15 The Ecological Impact Assessment for this scheme, located 5km south-east of the Development, concluded that there will be negligible effects on ecological features, including designated sites, habitats and protected species.¹⁶⁰. The development site lies beyond the 12.6km ZoI around Chilterns Beechwoods SAC. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land Between Three Cherry Trees Lane and Cherry Tree Lane, Hemel Hempstead (SADC: 5/2024/0927)

8.6.16 The scheme on land allocated within St Albans and Dacorum Local Plans, lies adjacent to the Development's western boundary. The ES for this scheme concluded that with the mitigation measures in place, the Spencer's Park Phase 2 development is unlikely to result in direct adverse effects on the important ecological features present at the site, or their conservation status.^{161, 162}. No badger setts or evidence of badgers were recorded, although the site contains habitat suitable for sett-building. As a result, badger was assessed as being of Site-level importance and was scoped out of further assessment.

8.6.17 The Habitats Regulations Assessment (HRA), produced by SES, concludes there will be no likely significant effects on Chilterns Beechwoods SAC via air quality impacts with measures also put into place to reduce air pollution in accordance with the local plan HRA. It states that the proposed mitigation for the development including financial payment into the SAMM scheme to be secured by a s106 or other suitable legal mechanism, and the delivery of an appropriate level strategic SANG (to be agreed with the LPA), will make sure that there are no adverse effects on the integrity of Chilterns Beechwood SAC, either alone and in-combination with other developments through recreational disturbance.¹⁶³. Natural England has objected to the application, stating that the HRA must be produced by St Albans City and District Council. In addition, they consider that the current proposals lack sufficient certainty regarding mitigation. Natural England advised that the applicant must either agree with them on the

¹⁵⁹ Turnstone Ecology. Ecological Appraisal. Land at Harpenden Road, St. Albans. 2020.

¹⁶⁰ Sound Ecology. Ecological Impact Assessment. Land Adjacent to the Noke Roundabout, (Copsewood) Chiswell Green, St Albans, Hertfordshire AL2 2DU. 2023.

¹⁶¹ SES. Ecological Impact Assessment. Spencers Park Phase II East, Hemel Hempstead. 2024.

¹⁶² Savills. EIA Statement of Conformity. Spencer's Park Phase II East. 2024.

¹⁶³ SES. Habitats Regulations Assessment: Information to Inform an Appropriate Assessment. Spencers Park Phase II East, Hemel Hempstead. 2024.

details of a bespoke off-site SANG of sufficient size to mitigate the entire Spencer's Park Phase II East development and which complies with NE's SANG Guidelines; or provide evidence of a signed Section 106 agreement with the relevant LPAs confirming access to adequate strategic SANG capacity. Given that the development falls both Dacorum Borough Council and St Albans City & District Council areas the applicant would likely need to secure strategic SANG capacity from both LPAs. Natural England further notes that, due to the scale of the development, a bespoke SANG, either on-site or off-site, would normally be expected, rather than reliance on existing strategic SANG, which are typically reserved for smaller developments. It is assumed that planning permission will not be granted unless the recreational impacts on the Chilterns Beechwoods SAC are satisfactorily addressed. On this basis, cumulative impacts are **not currently considered likely**.

Land At Gaddesden Lane, Redbourn, Hertfordshire, AL3 7DP

- 8.6.18 The scheme is located 830m to the north of the Development on land allocated for housing within the Local Plan. The Ecological Impact Assessment for this 300 unit residential scheme with new landscaping, public open space, concluded that there will not be any significant residual effects on ecological features, including designated sites, habitats and protected species.¹⁶⁴, although their search radius for statutory sites did not extend beyond 10km and so did not consider Chilterns Beechwoods SAC or its component SSSIs despite it lying within the 12.6km ZOI for the site. No HRA was evident on the planning portal, and the air quality statement did not include an assessment of ecological receptors. As an allocated site, however, effects on the SAC will have been considered as part of the SADC draft Local Plan HRA (2024). This concluded significant effects from air pollution were unlikely in-combination with predicted growth across the plan area. It also states that due to the submission of an application to Dacorum Council for a change of use from agricultural land to SANG (Dacorum planning application number 5/2024/1397) and the advanced nature of this application, this demonstrates the applicant's intention to provide SANG for this development to address plan-wide recreational effects. Cumulative effects from this scheme and the Development are considered to be **not significant**

Land At Marchmont Farm Piccotts End Lane, Hemel Hempstead, Hertfordshire, HP2 6JH

- 8.6.19 This allocated site lies 2.5km west of the Development. The bat activity surveys recorded at least nine species of bats commuting and/or foraging on this site including barbastelle, for which only occasional passes were recorded. The Ecological Impact Assessment reports that it is likely that barbastelles are using the riparian vegetation associated with the River Gade as their primary foraging and roosting resource, and only occasionally commute into the site to forage along the hedgerows. The on-site habitats used by this species, namely the western hedgerow and the woodland strip along the eastern boundary, will be retained. The eastern woodland strip will be enhanced as part of a green corridor, and the western hedgerow will be buffered with more than 10 m of additional native planting to maintain a dark dispersal route. This planting, including thorny scrub species such as hawthorn, blackthorn, and rose, will increase the hedgerow's height and density, helping to reduce light spill from nearby gardens and limit potential impacts from predators. In addition, a sensitive lighting strategy will be implemented to further minimise disturbance to bats. Consequently, any effects of the proposals on barbastelle are expected to

¹⁶⁴ CSA Environmental. Ecological Impact Assessment. Land at Gaddesden Lane, Redbourn. 2023.

be not significant due to the retention and enhancement of a dark dispersal and foraging corridor. The Ecological Impact Assessment for the scheme concluded that there will be negligible effects on ecological features, including designated sites, habitats and protected species including bats.¹⁶⁵ The proposed development also formed part of the traffic modelling with respect to changes in traffic flow and was therefore considered cumulatively with the Development. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land West Of Leighton Buzzard Road And North Of Galley Hill, Leighton Buzzard Road, Hemel Hempstead Hertfordshire, HP2

8.6.20 The Ecological Impact Assessment for this scheme, located 3.6km west of the Development, concluded that there will be negligible effects on ecological features, including designated sites and protected species.¹⁶⁶ Bat activity surveys identified barbastelle activity within the site with 23 passes noted in 2019. This species is strongly associated with woodland, all of which within or adjacent to the site will be retained, meaning there will be no direct loss of its optimal habitat. Some hedgerow severance is proposed to create access along the eastern boundary, however this is unlikely to have a significant impact as barbastelles are wide-ranging, can cross barriers such as roads more readily than other species, and suitable alternative habitat is available nearby, reducing potential effects of the hedgerow changes. A sensitive lighting strategy will also be implemented, including the establishment of dark corridors along retained hedgerows and tree belts, and measures to prevent light spill onto semi-natural habitats and trees with potential bat roosts.

8.6.21 Likely significant effects in relation to air quality including nitrogen deposition, at Chilterns Beechwoods SAC were considered unlikely in the HRA for the scheme both for the development alone and in-combination with other plans and projects. The application was refused, partly on the basis that it does not provide Suitable Alternative Natural Greenspace (SANG). Consequently, there is a lack of certainty that the proposed mitigation would be secured in perpetuity to mitigate the recreational impacts on the Chilterns Beechwoods SAC and the council could not rule out that the proposal alone or in-combination with other plan and projects would not result in likely significant effects to the SAC that would adversely affect its integrity. Air quality impacts were not flagged as a reason for refusal. The application is the subject of an ongoing appeal. Significant cumulative effects from this scheme and the Development in relation to the SAC are, however, unlikely given the SANG provision within the Development which will reduce its effect from recreational disturbance sufficiently to negate a significant in-combination effect with a development of this magnitude and relatively distant from the SAC. The cumulative effects from this scheme and the Development are therefore considered to be **not significant**.

Former British Gas Site London Road Hemel Hempstead Hertfordshire

8.6.22 The Ecological Assessment for the scheme, located 3.8km west of the Development on land allocated for housing within the Local Plan concluded that there will be negligible effects on ecological features, including designated

¹⁶⁵ WSP. Ecological Impact Assessment. Marchmont Farm. 2025.

¹⁶⁶ Ecology Co-op. Ecological Impact Assessment. Land west of Leighton Buzzard Road and North of Galley Hill, Hemel Hempstead. 2021

sites, habitats and protected species.¹⁶⁷, and that there will be no significant recreational effects on the Chilterns Beechwoods SAC. The bat activity surveys identified eight species of bat including barbastelle. The vast majority of activity was attributed to common pipistrelle and soprano pipistrelle. Low activity levels were recorded for other species, and it is not considered that rarer species, most notably barbastelle, frequently utilise the site for foraging and commuting, as more suitable habitat exists within the wider landscape. The lighting scheme for the site should be designed to limit light spillage on to the boundary features surrounding the site. New landscape planting as part of the proposals will offer new foraging and dispersal opportunities. No HRA is evident on the planning portal. As a site allocated for housing under the Local Plan, in-combination effects of increased recreation and air quality on the SAC have been considered within the local plan HRA which concluded no adverse effects on the SAC from air quality at either Tring Woodlands SSSI or Ashridge Commons and Woods SSSI, with recommendations made for appropriate mitigation in relation to recreation. The cumulative effects from this scheme and the Development are therefore considered to be **not significant**.

Land at Cooters End Lane and Ambrose Lane, Harpenden

8.6.23 The scheme is located 5.5km to the north-east of the Development. Although an Ecological Impact Assessment has not been produced yet, the Ecological Report concluded that provided recommended mitigation is implemented, there will be no adverse impacts upon ecological features.¹⁶⁸ The development site lies beyond the 12.6km ZoI around Chilterns Beechwoods SAC. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

North Hemel Hempstead Development Site, Hemel Hempstead Road, Redbourn, Hertfordshire

8.6.24 The scheme, located adjacent to the north of the Development, comprises up to 1,500 new dwellings. The scheme is residential-led and as such it has potential to contribute to cumulative impacts on ecological receptors sensitive to increased recreational pressure and air quality such as Chilterns Beechwoods SAC when considered alongside the Development. However, the scheme will deliver a significant area of SANG to address potential recreational effects and a shadow HRA assessment will be produced to examine all likely significant effects.¹⁶⁹ Local Plan HRAs for Dacorum and St Albans, which considered the allocated development as part of their in-combination assessment in relation to air quality, concluded no adverse effect on the SAC via this impact pathway. Therefore, it is anticipated that impacts from recreational pressure will be addressed and there will **not be any residual or other significant impacts** either on its own or in combination with the Development.

8.6.25 Ecology surveys for the scheme recorded two main badger setts within the site boundary. These setts are situated approximately 600m from the main sett identified in the northern section of East Hemel (Sett A-C), suggesting relatively small territory sizes in this area. As a result, it is considered unlikely that the North Hemel site forms part of the foraging grounds associated with Setts A-C. Therefore, cumulative effects on the badger population

¹⁶⁷ Ecology Solutions. Ecological Assessment. Former Hemel Hempstead Gasworks, Hemel Hempstead. 2025.

¹⁶⁸ Baker Consultants. Harpenden Ecological Report. 2019

¹⁶⁹ Quod. EIA Scoping Report North Hemel Hempstead. 2025

associated with East Hemel arising from any foraging habitat loss or sett closures at North Hemel are **not anticipated**.

- 8.6.26 Several skylark territories were recorded within the boundary of the scheme. Mitigation measures have been recommended to retain skylark on site and minimise impacts including the incorporation of wide, open, species rich grassland within the scheme's SANG; alongside areas of mixed scrub rich in fruit bearing species incorporated at the edges of the grassland to create a diverse habitat mosaic. Provided these are implemented and the skylark population is retained, impacts on skylark are considered unlikely, and as such, cumulative effects with the Development are also considered **unlikely**
- 8.6.27 Two red kite nests were recorded within the southern field. To prevent disturbance during the breeding season, a buffer of 150–300 m around the nests has been recommended in line with best practice. Provided these measures are implemented, impacts on red kite are considered unlikely, and as such, cumulative effects with the Development are also considered **unlikely**.
- 8.6.28 Barbastelle were recorded sporadically across activity surveys in low numbers. The small number of registrations recorded from this species are not consistent with the level that would be expected were the Site to provide an important commuting corridor between foraging sites or for it to provide important foraging habitat for this species. While there will be a small loss of woodland to facilitate access into the site along the western site boundary with Hertsmere End Lane, most of the woodland habitat will be retained and will continue to provide good foraging habitat, in combination with woodland planting within the proposed SANG. Therefore, the loss of woodland will not have a significantly detrimental impact on bats. Small gaps will also be created in a number of hedgerows throughout the Site to create access routes between development parcels. Where hedgerows are to be impacted and cut through for the creation of access, 'hop-overs' will be created to help maintain the integrity of the hedgerows as commuting routes for bats. A sensitive lighting strategy will also be implemented across the development to minimise impacts on bats and other wildlife and retain hedgerows as dark corridors. The proposed green infrastructure includes the creation of species-rich grassland, scrub, woodland planting and pond creation, much of which will be focused within the proposed SANG. This will provide improved foraging resources for bats and improve connectivity within the Site and to the wider landscape¹⁷⁰. Provided the proposed measures are implemented, impacts on barbastelle are considered unlikely, and as such, cumulative effects with the Development are also considered **unlikely**.

Proposed Solar Farm, Potters Crouch, Hertfordshire

- 8.6.29 The proposal are located 650 south-east of the Development and include a solar farm. It received a Screening Opinion on 8 May 2025 confirming that an Environmental Impact Assessment will not be required. The EIA screening report concluded that given the nature of the proposals, there is no potential for significant effects on regionally, nationally, or internationally designated ecological sites and that no significant adverse effects are

¹⁷⁰ FPCR. North Hemel Hempstead. Appendix 13.1 Bat survey report. Report for Bloor Homes and Pigeon. 2025

expected on protected species, or habitats.¹⁷¹. Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Land Off Sandridgebury Lane And Between The Railway And Harpenden Road St Albans Hertfordshire

- 8.6.30 The scheme is located 5.5km west of the Development. The Environmental Statement concluded that there will be negligible effects on ecological features, including designated sites, habitats and protected species.¹⁷² and the development site lies beyond the 12.6km ZoI around Chilterns Beechwoods SAC Therefore, cumulative effects from this scheme and the Development are considered to be **not significant**.

Westwick Row, Land to the South of Green Lane (Draft allocation)

- 8.6.31 The scheme is located adjacent to the south-west of the Development and has a draft allocation for the development of up to 80 new homes in Dacorum Borough Council's emerging Local Plan. No desk study or baseline ecology surveys have been undertaken for the site, therefore any likely impacts to ecological features are currently **unknown**. Given the residential nature of the allocation it is likely that the proposals could contribute to cumulative impacts on ecological receptors sensitive to increased recreational pressure such as Chilterns Beechwoods SAC when considered alongside the Development. However, provided appropriate mitigation measures are in place for this site, and considering the Development itself is assessed as having no significant direct effects on these receptors, cumulative effects from recreation disturbance are **not considered likely**.

8.7 Conclusions

- 8.7.1 Best practice measures would be adopted during the enabling and construction works to avoid potential harm and disturbance to great crested newts and reptiles, and nesting birds (including Schedule 1 species). This would include sensitive timing, methods and ecological supervision. A licence would be obtained from Natural England to allow for removal of badger setts and removal/disturbance bat roosts without risk of harm to these species. Best practice measures would also be adopted to safeguard retained woodland, trees, hedgerows and waterbodies on and off-site and to make sure potential damage or degradation of habitats does not occur as a result of construction activities, including from artificial lighting. These measures would be implemented under a CEMP.
- 8.7.2 There would be risk of disturbance to and displacement of badgers, bats, nesting birds and bats during the Works. This would be limited as far as possible by the phasing of the Works to minimise disturbance at any one time and by ensuring that alternative nest, roost or refuge provision (e.g., replacement setts, and bat and bird boxes) are provided ahead of works in each phase. Habitat creation, to include areas integral to ensuring connectivity to retained habitats on and off-site for species such as badgers and bats will also be timed to align with the phased losses of habitat to the works.

¹⁷¹ Exagen. EIA Screening Report. Beechtree Junction Energy Park. 2025

¹⁷² LRM Planning Limited. Environmental Statement. Wollam Park. 2025

- 8.7.3 Mitigation has been included in the design to retain the majority of existing trees and hedgerows as well as selecting landscape planting that would be of benefit to wildlife. Bird nest boxes, and bat roost features, as well as other enhancements for invertebrates, would be incorporated into the Development. Overall, the new landscape planting would provide a biodiversity net gain (N.B. the BNG assessment is considered separately to the ES and not quantified here). Additional mitigation measures have been set out which would be included in a CEMP, LEMP, EMEMS and lighting scheme and secured by way of planning condition to achieve no residual significant effects on ecological receptors.
- 8.7.4 In the long-term it is anticipated that the Development would result in the continued provision of habitats for the local populations of badger, bats, barn owl, raptors and the majority of breeding birds, as well as any populations of great crested newt and reptile that may be present. Whilst there is the potential for injury/mortalities due to increased traffic flows and predation, the provision of improved habitats on site will likely increase the resilience of bats and birds populations to an extent that the residual effects would not be significant. Bird species that will not be readily accommodated on the Development (e.g., skylark) will be provided for via off-site compensation measures. On and off-site habitat linkage, including badger underpasses, hop-overs, planting and buffers, would enable species to continue to move within the Site and between the Site and the surrounding area. Important to this will be an appropriate sensitively designed lighting scheme that avoids direct illumination of wildlife features and provides dark corridors and refuges for foraging, commuting and roosting bats.
- 8.7.5 New landscape planting will be selected to include plant species that provide a range of food resources for wildlife that will be available sequentially throughout the year, to include nectar, berry, nut and seed producing species and those with value in supporting invertebrates, both for their inherent value and also for species dependent on them as a foraging resource (e.g., bats and nesting birds). The long-term ecological value of habitats would be assured via a commitment to management in perpetuity.
- 8.7.6 The Development accords with relevant national and local planning policy by virtue of providing publicly accessible greenspace and SANG, green infrastructure to link or connect wildlife habitats, net gain in biodiversity and the retention and safeguarding of as many of the existing trees, woodland, hedgerows and other features as possible.
- 8.7.7 On the basis of information to date, there are no other nearby developments that would result in a cumulative effect on ecology during the Works or in the long-term.