



LAND TO THE WEST OF HATFIELD

Environmental Statement – Chapter 14: Ecology

Arlington Business Parks GP Limited

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14 ECOLOGY

14.1 INTRODUCTION

14.1.1 Scope

This chapter presents the approach and findings of the assessment of potential effects of the Proposed Development on ecology and nature conservation. It includes:

- A summary of relevant legislative policy and framework.
- A description of the assessment methodology and scope, including details of consultation, methods of data collection used to inform the assessment (and any assumptions and limitations therein), and criteria used to assess significance of effects.
- A review of the baseline conditions at the Application Site and surrounding area and an assessment of important ecology features that could be affected by the Proposed Development.
- The identification of potential effects on these features and an assessment of the likely extent of these effects.
- Recommendations for appropriate avoidance measures, mitigation, compensation and enhancement.
- Consideration of residual effects following mitigation, and of their significance.
- Identification of cumulative and in-combination ecological effects and their significance.
- A final appraisal of the Proposed Development in terms of relevant policy and legislation.

14.1.2 Ecological Site Description

The 67.5 ha Application Site is located to the west of Hatfield, Hertfordshire, and centred on national Grid Reference TL 204093. It forms part of the former Hatfield Aerodrome. It is currently dominated by rough grassland and scrub and is managed for public access as Ellenbrook Fields.

Aerial photography available on Google Earth indicates that much of the aerodrome infrastructure was still in place within the Application Site as recently as the year 2000. In addition, various other buildings and structures were also present in the centre-south of the Application Site associated with film production at around that time.

The soils at the Application Site include freely draining slightly acid loamy soils and slowly permeable seasonally wet acid loamy and clayey soils (Cranfield University, 2015).

Commercial warehouse development borders the east of the Application Site, and a recent residential development and Hatfield Business Park border the Application Site to the south-east. To the north, the Application Site is bordered by Cooper's Green Lane and Astwick Manor, with arable land, hedgerows and woodland beyond. To the west are arable land, woodland and quarry workings. To the south and south-west there is an extensive area of open grassland and scrub which formed part of the former aerodrome and for which a planning application for sand and gravel quarrying has recently been submitted. To the south there is also an area of community sports pitches on hardstanding.

14.1.3 Ecology Strategy and Designed-in Ecology Mitigation

During the evolution of the Proposed Development, there has been ecological input from the Ecological Consultant (BSG Ecology). This input has been used to 'design-in' a range of primary ecological mitigation into the layout of the Proposed Development.

The use of such mitigation demonstrates that the ecology mitigation hierarchy (CIEEM, 2016) has been employed in this scheme from inception.

Detail of site work necessary to retain, create and manage retained and new ecological features during and after construction will be provided in an overarching Construction Environmental Management Plan and Landscape Environmental Management Plan for the Proposed Development. It is recommended that production of these documents, and their approval by Welwyn Hatfield Borough Council, is subject to planning condition. These documents would cover the Ecology Strategy and designed-in mitigation and any necessary additional ecology mitigation detailed later in this Environmental Statement.

14.1.3.1 Avoidance of effects

The designed-in mitigation includes the following avoidance measures:

- Retention of approximately one third of the semi-improved neutral grassland at the Application Site, which is sufficient to allow conservation grazing to continue.
- Retention of the Ellenbrook stream.
- Retention of all mature woodland at the Application Site (i.e. an area of ash woodland in the western part of the Application Site).
- Retention of all mature trees at the Application Site (these are located on the northern and north-eastern boundaries), though there will be some loss of semi-mature and young trees that are of low ecological value.
- Retention of four ponds at the Application Site (including two ponds that are of high ecological value and support great crested newt), and areas of surrounding terrestrial habitat. The single pond to be lost in the development is of very low ecological value.

14.1.3.2 Mitigation of effects

The designed-in mitigation includes the following measures which mitigate negative ecological effects:

- Creation of green corridors of woodland, scrub and grassland habitat along the eastern and western boundaries of the Application Site, thus maintaining existing north-south ecological connectivity.
- Creation of an east-west green link across the northern part of the Proposed Development, with associated trees and grassland planting, maintaining east-west ecological connectivity.

14.1.3.3 Enhancement

14.1.3.3.1 Habitat Management

The following habitat management will be carried out to enhance the ecological value of certain retained habitats at the Site:

- Management of the retained ponds. These are currently not in optimal condition due to grazing, shading and drying out, and have considerable potential for habitat improvement. These ponds will be managed to enhance their ecological value by removing some of the shading vegetation and the excessive vegetation and silt (including more extensive digging out where appropriate), and fencing out cattle to allow regeneration of marginal vegetation and to reduce trampling.

- Management of the retained hedgerows. These will be managed through late winter trimming every three years in order to improve and maintain shape and size. This will allow flowering and fruiting in two out of three years for any one hedgerow. A maximum of one third of the hedgerow network at the Application Site will be trimmed in any one winter.

14.1.3.3.2 Wildlife infrastructure

The Application Site will be provided with a range of wildlife infrastructure to ensure that both developed areas and areas of greenspace provide space for wildlife. This will include the following as a minimum:

- Bird nest boxes (totalling 5% of the number of new buildings/apartments) will be incorporated into the fabric of new buildings at the Site. These will be focused in parts of the Application Site close to suitable foraging habitat for birds, and will include boxes targeted at suburban species (including house sparrow and starling) and also some general purpose nest boxes.
- Bat nest tubes (totalling 5% of the number of new buildings/apartments) will be incorporated into the fabric of new buildings at the Site. These will be focused in parts of the Application Site close to suitable foraging habitat for bats, and suitable for species known to be present in the vicinity of the Site.
- At least 25% of new urban and suburban trees in the development will be native or fruiting species that provide habitat and/or food for wildlife.

14.1.3.3.3 Enhancement: De-culverting of Ellenbrook

A 140 m section of the Ellenbrook is currently culverted under part of the former airfield. This will be opened and returned to a naturalistic watercourse with open native bankside vegetation, and will fall within the east-west green link across the northern part of the Proposed Development, with associated trees and grassland planting. Where possible, the main site access road, entering the site from the north, will pass over this green link via a bridge rather than having the Ellenbrook culverted under the road, and bankside will be present on both sides of the Ellenbrook under the bridge. This will enhance ecological connectivity along this corridor, especially for riparian mammal species.

14.1.3.3.4 Woodland Management at Home Covert and Round Wood LWS

The Proposed Development will include a package of conservation-led woodland management measures to maintain and, where possible, improve, the conservation value of this woodland site adjacent to the west of the Application Site. This will also cover the woodland within the west of the Application Site.

14.1.3.3.5 Pond creation

Four new ecology-focused ponds suitable for great crested newt will be constructed within appropriate areas of new or retained habitat at the west or south the Application Site. This will include the planting of native aquatic and marginal vegetation of suitable local provenance.

14.1.3.3.6 Additional wetland features

Sustainable drainage ponds will be created in the east of the Site as part of the drainage strategy. These will have bankside planting with appropriate native species of suitable local provenance. These features will provide additional wetland habitat of value for species such as birds and bats.

14.2 METHODOLOGY

14.2.1 Study Area

For designated wildlife sites, the study area extends to 10 km from the Application Site for international sites (such as Ramsar wetlands) and 5 km for national sites (such as Sites of Special Scientific Interest).

For habitats, the study area is limited to the Application Site itself.

For protected species, the study area was limited to the Application Site itself for all species except for great crested newt (which can travel up to 500 m from breeding ponds). However, the desk study considered records of protected species from within 5 km of the Site Centre. This was in order to provide local context, and because biological data and recording is very variable (and in some areas sparse), and smaller search areas may yield few or no records.

For great crested newt, the study area extends to a maximum 500 m from the Application Site in terms of desk study. Ponds, where accessible, were surveyed for this species up to 250 m from the Application Site.

14.2.2 Legislation and Planning Policy Guidance

Key national planning policy relevant to this assessment is set out in the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG), particularly that regarding the preservation, restoration and re-creation of priority habitats and the avoidance of net loss of biodiversity. Relevant local planning policy includes the saved policies of the Welwyn Hatfield District Local Plan 2005, which relate to: river corridors, biodiversity and development, Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNRs), Wildlife Sites, trees, woodland and hedgerows, and light pollution.

Key wildlife and conservation legislation relevant to this assessment includes the Conservation of Habitats and Species Regulations 2017 (particularly regarding the protection of great crested newt *Triturus cristatus*), the Natural Environment and Rural Communities Act 2006 (which identifies Habitats of Principal Importance in England ('HPI's and Species of Principal Importance in England ('SPI's), the Wildlife and Countryside Act 1981 (as amended) (particularly regarding the protection of nesting birds), the Protection of Badgers Act 1992 and the Hedgerow Regulations 1997.

A more detailed review of legislation and policy relevant to this ecology assessment is provided in Appendix 14.1

14.2.3 Scoping Assessment

Consultation was carried out in March, April and October 2016 with Martin Hicks, Ecology Advisor at Hertfordshire Ecology, acting on behalf of Welwyn Hatfield Borough Council. This consultation was carried out via a meeting and email. The consultation focused on the scope of ecology baseline surveys necessary for assessment of the Proposed Development, the likely ecological value of the grassland at the Application Site (based on information available at the time) and appropriate mitigation.

14.2.3.1 Scope of baseline surveys

The scope of the proposed ecology baseline surveys was set out in an email from Tom Flynn (BSG Ecology) to Martin Hicks (Hertfordshire Ecology) on 06 April 2016. Martin Hicks replied on 15 April 2016, agreeing with this scope. This correspondence is provided in Appendix 14.2. Martin Hicks agreed that four (rather than six) overnight survey visits for great crested newts per pond would be

appropriate for an outline planning application, and also noted that survey for butterflies at the Application Site should be considered.

Extensive ecological surveys have been carried out at the Application Site to provide ecological baseline information to inform this assessment. These surveys are summarised in Table 14.1.

Table 14.1: Ecological surveys.

Survey/Study	Work undertaken
Desk Study	Data search by Hertfordshire Environmental Records centre, 27 March 2015. MAGIC website search, 12 July 2018. Ordnance Survey pond search, 2015, 2016, and 12 July 2018.
Habitat survey	Extended Phase 1 habitat survey, 07 April 2015. Repeat of above, 05 July 2018.
Hedgerow survey	Carried out 05 July 2018.
Plants	Botanical survey of grassland, 12 July 2016.
Badger	Badger survey 27 April 2016, updated 5 July 2018.
Bats	Assessment of bat roost potential, 7 April 2016. Transect surveys, monthly visits April 2016 to October 2016. Automated surveys, monthly April 2016 to October 2016.
Dormouse	Survey involving 100 dormouse tubes set up in March 2016. Monthly survey visits April to September 2016.
Water vole	Two-visit survey, 27 April 2016 and 13 September 2016.
Otter	Two-visit survey, 27 April 2016 and 13 September 2016.
Breeding birds	Three-visit characterisation survey, April to June 2016.
Great crested newt	Habitat Suitability Index assessment 07 April 2015, and updated May 2016. Environmental DNA survey of selected ponds, 27 May 2015. Overnight surveys March to June 2016 (four visits per pond).
Common reptiles	Survey involving 200 artificial reptile refuges set up in March 2016. Seven survey visits carried out April to June 2016.
Invertebrates	Butterfly transects carried out on 04 May 2016, 12 June 2016 and 05 July 2018.

14.2.3.2 Value of grassland and appropriate mitigation

The ecological value of the grassland, and appropriate mitigation for its loss was discussed at a meeting at Hatfield Welwyn Borough Council Offices held on 15 March 2016. A meeting summary was subsequently circulated, to which Martin Hicks provided a response on 21 March 2016. Further correspondence clarifying his view on the potential for off-site habitat compensation was carried out by email on 26 October 2016. This correspondence is provided in Appendix 14.2.

From the information available at the time, Martin Hicks agreed that the northern part of the Site (which is managed as hay meadow) was relatively species-poor and that the southern (grazed) part of the Application Site was of greater ecological value, possibly meeting the criteria for the selection of a Local Wildlife Site. Martin Hicks was keen to see grazing maintained at the Site. He noted that off-site compensatory habitat creation would be possible habitat, but that retention of grassland habitat at the Application Site would be preferable.

14.2.4 Assessment Methodology

The evaluation and assessment within this chapter has been undertaken with reference to relevant parts of the *Guidelines for Ecological Impact Assessment in the United Kingdom* developed by the Chartered Institute of Ecology and Environmental Management (CIEEM, January 2016). Although this is recognised as current best practice for ecological assessment, the guidance itself notes that it is not a prescription about exactly how to undertake an ecological impact assessment (EclA); rather, it aims to “*provide guidance to practitioners for refining their own methodologies*”. Therefore BSG Ecology has applied its own methodology in line with this.

14.2.4.1 Important ecological features

A first step in EclA is determination of which ecological features (habitats, species, ecosystems and their functions/processes) are important. Important features should then be subject to detailed assessment if they are likely to be affected by the Proposed Development. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project effects, such that there is no risk to their viability.

Ecological features can be important for a variety of reasons and the rationale used to identify these is explained below. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline.

14.2.4.2 Evaluation: determining importance

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case:

- International (European)
- United Kingdom
- England
- County (Hertfordshire)
- Local (Welwyn Hatfield Borough)
- Application Site

Taking into account the CIEEM guidance, features of less than local importance are generally considered unlikely to trigger the need for mitigation or to conflict with policy.

Features which require mitigation in order to ensure legal compliance are considered to be important features, even if their conservation value is low or not applicable (e.g. badger, which is not a rare species but which receives legal protection on animal welfare grounds).

14.2.4.3 Features to be excluded from further assessment

The assessment of ecological effects focuses on those ecological features likely to suffer significant effects (adverse or beneficial). Prior to this stage of the assessment it was possible to scope out particular ecological features from further assessment by taking into account both the likelihood of a significant effect occurring and the evaluation of particular feature described above. For example, poor semi-improved grassland, hardstanding, and species considered unlikely to be present at the Application Site on the basis of survey results.

14.2.4.4 Assessment of effects

The assessment of the significance of ecological effects involves:

- Identifying and characterising significant effects.
- Incorporating measures to avoid and mitigate (reduce) these significant effects.
- Assessing the significance of any residual effects after mitigation.
- Identifying appropriate compensation measures to offset significant residual effects.
- Identifying opportunities for ecological enhancement.

Industry standard guidance (CIEEM, 2016) notes that it is only essential to assess and report significant residual effects (those that remain after mitigation measures have been taken into account). However, this guidance also notes that it is good practice for the EIA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation (CIEEM, 2016). This process of assessment without mitigation helps to identify necessary and relevant mitigation measures that are proportionate to the size, nature and scale of anticipated effects.

The guidance (CIEEM, 2016) also notes that the assessment only needs to describe those characteristics of effects that are relevant to understanding the ecological effect and determining the significance. It should consider, as appropriate: direct, indirect, secondary and cumulative effects and whether these are short, medium, long-term, permanent, temporary, reversible and / or irreversible. In this chapter, positive effects are referred to as beneficial; negative effects as adverse. The assessment of significant effects then takes into account the baseline conditions to describe:

- how the baseline conditions will change as a result of the project and associated activities.
- cumulative effects of the proposal and those arising from other developments.

14.2.4.5 Significant effects

The CIEEM guidance sets out information in paragraphs 5.25 through to 5.29 about the concept of ecological significance and how it relates to the ability to deliver biodiversity conservation objectives for a given feature.

Significant effects are qualified with reference to an appropriate geographic scale. The scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important (e.g. because it may only affect that feature in part).

The nature of the identified significant effects on each assessed feature is characterised. This is considered, along with available research, professional judgement about the sensitivity of the feature affected, and professional judgement about how the significant effect is likely to affect the population structure or continued function of the habitat, species or designated site. Where it is concluded that an effect would be likely to reduce the ecological importance of an assessed feature, it is described as significant. The degree of significance of the effect takes into account the geographic context of the feature's importance and the degree to which its interest is judged to be affected. The CIEEM guidance encourages the expression of the severity of ecological effects with reference to a geographic frame of reference, as described above. However, other environmental disciplines often use a relative scale of severity with four categories (Major, Moderate, Minor or Negligible).

Table 14.2 provides a means of relating the geographic scale of impact to the four standard categories of severity, following the approach of Box et al. (2017). This means of converting the CIEEM geographic impact scale to the standard EIA impacts scale (used widely across other technical disciplines) is provided in order to allow the ecological impact assessment to be integrated into the wider EIA in a clear and transparent way, without compromising the CIEEM approach (CIEEM, 2017).

Table 14.2: Relationship between ecological impact assessment and wider EIA assessment of significance (based on Box *et al.*, 2017).

Geographic scale of impact (as per CIEEM 2016 guidance)	Severity
International, European, national or regional	Major
Regional, metropolitan, county, vice-county or other local authority-wide area.	Moderate
Local	Minor
Application Site (or areas immediately adjacent) or below	Negligible

Where the potential effects (i.e. before mitigation) and the residual effects (i.e. after mitigation) are presented within this chapter (i.e. in Tables 14.10, 14.12, 14.13 and 14.15), both the CIEEM geographic scale of effects and the equivalent EIA-based severity (as described above) are provided for clarity.

Once the geographic scale and severity of the effect has been assessed, professional judgement is then used to assess the significance of that effect, taking into account factors such as the likelihood of affecting the distribution, abundance (and ultimately the conservation status) of protected species, or affecting the connectivity or quality of protected habitats, or of breaches in wildlife legislation or contravention of planning policy.

14.2.4.6 Mitigation

Where significant effects have been identified, the mitigation hierarchy has been taken into account, as suggested in the 2016 EIA Guidelines, which sets out a sequential approach of avoiding significant effects where possible, applying mitigation measures to minimise unavoidable significant effects and then compensating for any remaining significant effects. Once avoidance and mitigation measures, and any necessary compensation measures, have been applied, and opportunities for enhancement incorporated, residual significant effects are then explicitly identified. This approach is reflected across UK planning policy.

Where mitigation and compensation has been proposed, this is proportionate with the geographical scale at which an effect is significant, *“For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved”* (CIEEM, 2016. Paragraph 5.29).

The principals of enhancement as set out in the CIEEM guidance and of net gain in biodiversity, as set out in the NPPF are also incorporated into the mitigation section, to ensure that feasible opportunities for ecological enhancement and for reductions in the severity of non-significant adverse effects are also incorporated in the Proposed Development.

14.2.4.7 Assumptions and Limitations

The baseline surveys that were carried out at the Application Site followed current standard industry guidance and therefore provides a robust basis for the identification of important ecological features. However, no surveys can provide absolute confidence about the presence or absence of species at a site, or completely accurate knowledge about the distribution of species across a site.

The assessment is based on baseline survey results that are accurate at the time of survey. However, the baseline can change due, for example, to the mobility of some species, changes in land management and natural processes of vegetation succession. An updated Phase 1 habitat survey was

carried out at the Application Site on 05 July 2018 by Dr Tom Flynn MCIEEM and Tim Elton, both Senior Ecologists at BSG Ecology. No significant changes in the habitats at the Application Site or the potential of the Application Site to support protected or notable species were observed at this time, and it is therefore considered that the baseline data are up-to-date for the purpose of conducting a thorough assessment.

There were limitations of access to some areas of dense scrub at the Application Site. These are not considered to have significantly affected this assessment, because all accessible areas on the periphery of such scrub were subject to survey where necessary (e.g. during badger surveys), and precautionary approaches to the clearance of such vegetation have been specified in the mitigation section, where necessary.

14.3 BASELINE CONDITIONS

This section provides information pertaining to the ecology and nature conservation value of the Application Site prior to the Proposed Development.

14.3.1 Statutory Wildlife Sites

Designated wildlife sites that are protected by statute present within 5 km of the Application Site are listed in Table 14.3. Statutory wildlife sites beyond this distance were not considered to have any possibility of being significantly affected by the Proposed Development.

Table 14.3: Statutory wildlife sites within 5 km of the Application Site.

Designation	Name	Distance and direction
Ancient Woodland	Symondshyde Great Wood	730 m, NW
LNR	Howe Dell LWS & LNR	2.1 km, E
LNR	Stanborough Reedmarsh LWS	2.3 km, NE
LNR	Oxleys Wood	2.3 km, NE
LNR	Colney Heath	2.6 km, S
LNR	The Wick Wood	3.5 km, W
SSSI, LNR	Sharrardspark Wood	4.1 km, NE
LNR	Wheathampstead Development Centre	4.2 km, NW

14.3.2 Non-statutory Wildlife Sites

Wildlife sites that are not protected by statute that are present within 1 km of the Site are listed in Table 14.4. Sites beyond this distance were not considered to have any possibility of being significantly affected by the Proposed Development.

Table 14.4: Non-statutory designated wildlife sites within 1 km of the Application Site.

Designation	Name	Distance and Direction
LWS	Home Covert and Round Wood	Adjacent, W
LWS	Furzefield Wood LNR	2.1 km, NW
LWS	Symmondshyde Great Wood	730 m, NW
LWS	Copse South of Symmondshyde Great Wood	1.0 km, W

LWS	Sleeve Hall Wood	700 m, W
LWS	Copse at Nast Hyde	1.0 km, S
LWS	Hook's Wood	1.0 km, W

14.3.3 Habitats

Phase 1 habitats (JNCC, 2010) present within the Application Site are listed and described in Table 14.5.

Table 14.5: Phase 1 habitats present within the Application Site.

Phase 1 habitat type	Summary description
Semi-improved neutral grassland	The grazed semi-improved neutral grassland which dominates the centre and south of the Application Site contains a range of grasses and forb species. Overall it has a moderate species-richness (based on Natural England (2010)). It does not conform to the description of the Habitat of Principal Importance Lowland Meadows (BRIG, 2011) or the criteria for this habitat in Natural England (2010). However, it meets Hertfordshire Local Wildlife Site criteria in at least some areas and its extent increases its overall value.
Poor semi-improved grassland	An area of relatively species-poor grassland dominated by the grasses false oat-grass <i>Arrhenatherum elatius</i> and cock's-foot <i>Dactylis glomerata</i> is present in the northern part of the Application Site. This generally has a low species-richness (based on Natural England (2010)). It does not conform to the description of the Habitat of Principal Importance Lowland Meadows (BRIG, 2011) or the criteria for this habitat in Natural England (2010) or meet Hertfordshire Local Wildlife Site criteria.
Scrub	Areas of dense and scattered scrub generally dominated by hawthorn <i>Crataegus monogyna</i> are present towards the eastern and western boundaries of the Application Site. There is occasional willow scrub in the centre-south.
Semi-natural broadleaved woodland	A small area (0.42 ha) of ash woodland is present in the western part of the Application Site. This appears to be of recent (20 th Century) origin. This woodland conforms to the description of the Habitat of Principal Importance Lowland Mixed Deciduous Woodland (BRIG, 2011).
Broadleaved plantation woodland	Areas of young planted or self-sown trees of native species are present in small parts of the east and west of the Application Site.
Ellenbrook	A stream, the Ellenbrook, emerges from a culvert in the north-east of the Application Site and flows south along much of the eastern boundary of the Application Site. A total of 0.51 km of the stream is within the Application Site.
Hedgerows	Two sections of hedgerow are present on the northern and the north-western boundary of the Application Site. These comprise various native shrub species. The hedgerow on the northern boundary (adjacent to Coopers Green Lane) is species-rich. Neither hedgerow is 'Important' under the Wildlife and Landscape criteria of the Hedgerow Regulations 1997.
Mature trees	Twenty-eight mature oak and ash trees are present on or close to the boundaries of the Application Site. Fifteen of these are in woodland in the west of the Application Site. The remainder are close to the boundary in

	the north-west and north-east. Two, near the north-eastern corner of the Site, are veteran trees.
Ponds	Five ponds are present within the Application Site. Three are small and shallow and were found to have dried up by June in 2016. One, close to the southern boundary of the Application Site, is larger and has not been observed to dry up during baseline surveys. Marginal and aquatic vegetation within three of the ponds is limited (by shading, grazing or drying). A fourth pond contains abundant aquatic vegetation and some emergent vegetation.
Hardstanding	Small areas of hardstanding, such as asphalt paths are present at the Application Site.

14.3.4 Protected and Notable¹ Species

The presence of protected and notable species at the Application Site, based on the results of the baseline surveys, is summarised in Table 14.6.

Table 14.6: Presence of protected and notable species at the Application Site.

Species	Status	Presence at the site
Plants	Various	Due to the relatively recent origins of the habitats present at the Site, and based on survey results, protected and red data book plant species (i.e. species listed in Stroh et al., 2014) are likely absent.
Badger	Protected in the UK	Badger setts are present outside but close to the Application Site boundary.
Bats	European protected species	The following species use the Application Site for foraging/commuting in moderate numbers: soprano pipistrelle <i>Pipistrellus pygmaeus</i> , common pipistrelle <i>Pipistrellus</i> , noctule <i>Nyctalus noctula</i> , Leisler's bat <i>Nyctalus leisleri</i> , <i>Myotis</i> sp., brown long-eared bat <i>Plecotus auritus</i> , Nathusius' pipistrelle <i>Pipistrellus nathusii</i> and (in low numbers) barbastelle <i>Barbastellus barbastellus</i> . Potential bat roost sites are limited to mature trees close to the north and north-west boundary, and in woodland in the west of the Application Site. Of these, nine have high potential, 12 have moderate potential and seven have low potential to support roosting bats.
Dormouse	European protected species	Survey indicated that this species is likely absent.
Water vole	Protected in the UK	Survey indicated that this species is likely absent.
Otter	European protected species	Survey indicated that this species is likely absent.
Brown hare	SPI	Present in low numbers.
Harvest mouse	SPI	Potentially present.

¹ 'Notable species' include Species of Principal Importance in England, species included in the most recent red data lists for England or the UK, bird species listed on the most recent Birds of Conservation Concern list (Eaton et al, 2015), invertebrates meeting the JNCC criteria for scarce and notable species, plants listed in Stewart et al (1994), and species listed by the Hertfordshire Environmental Records Centre as notable in Hertfordshire.

Hedgehog	SPI	Potentially present.
Breeding birds	Protected in the UK, SPI	A range of bird species breed at the Application Site, including Species of Principal Importance in England that are typical of grassland, hedgerow and scrub or water body margins (e.g. linnet <i>Carduelis cannabina</i> and reed bunting <i>Emberiza schoeniclus</i>), scrub and woodland (e.g. song thrush <i>Turdus merula</i> and dunnock <i>Prunella modularis</i>) and extensive open grassland (skylark <i>Alauda arvensis</i> and lapwing <i>Vanellus vanellus</i>). Barn owl <i>Tyto alba</i> has been recorded from the Application Site, though there is no evidence of current or recent breeding by this Schedule 1 species.
Great crested newt	European Protected Species	A moderate population (i.e. a maximum count between 11 and 100 adults (Natural England,2015)), is present on and around the Application Site. Adults and eggs were found in two ponds in the south of the Application Site and adults were also found in the Ellenbrook in the east of the Application Site.
Common toad	SPI	Abundant at the Application Site. No signs of breeding were found, but two ponds in the south of the Application Site appear to provide suitable breeding habitat. Other ponds at the Application Site are likely too shallow or likely dry out annually, making them unsuitable.
Common reptile species	Protected in the UK	Survey indicated that these species are likely absent.
Invertebrates	Various	Due to the abundance of semi-improved grassland at the Application Site, and the presence of small areas of woodland and wetland, a moderate range of invertebrates is likely to be present. However due to the absence of undisturbed or particularly species-rich habitats (e.g. ancient woodland, species-rich unimproved grassland or long-established wetland habitats), the Application Site does not provide habitat with high potential to support important invertebrate assemblages or protected invertebrate species. The ponds at the Application Site are in poor condition or, based on aerial photographs, are of relatively recent origin (i.e. post 2000).

14.4 EVALUATION

14.4.1 Important Ecological Features

Of the designated wildlife sites, habitats and protected species listed in Tables 14.3, 14.4, 14.5 and 14.6 above, those included in Table 14.7 below have been evaluated for their conservation importance and are considered to be of sufficient importance to warrant them being carried through to the impact assessment stage. The Geographic context in which they are considered important is also indicated in the table.

Table 14.7: Important ecological features with potential to be affected by the Proposed Development.

Feature	Geographic level of importance	Justification
1. Symondshyde Great Wood LWS and Ancient Woodland	Hertfordshire	Ancient woodland is a non-recreatable ecological resource. Mixed deciduous woodland is a Habitat of Principal Importance in England. This LWS site has been designated at the County Level, but not at the national (i.e. SSSI) level. It is replanted ancient woodland.
2. Home Covert and Round Wood LWS	Hertfordshire	Mixed deciduous woodland is a Habitat of Principal Importance in England. This LWS site has been designated at the County Level, but not at the national (i.e. SSSI) level.
3. Semi-improved neutral grassland	Welwyn Hatfield District	This grassland is of moderate species-richness. It is not ancient unimproved grassland, and based on aerial photographs, much of it has been subject to significant earth movements up until at least the year 2000. However, its extent is notable within the context of Hertfordshire.
4. Scrub	Local	Scrub is a relatively common and widespread habitat, but the extent present at the Application Site is notable in a local context. This feature likely contributes to local ecological connectivity along the western and eastern margins of the Application Site.
5. Semi-natural broadleaved woodland	Welwyn Hatfield District	The small area of ash woodland in the western part of the Application Site appears to have developed through natural colonisation in the latter part of the 20 th Century, including the canopy, shrub layer, field layer and ground layers. Ancient woodland indicator species are absent, but there is potential for colonisation, given the proximity to established woodland.
6. Ellenbrook	Local	The course of the Ellenbrook within the Application Site is thought to be of relatively recent (i.e. 20 th Century) origin. A range of native plant species is present, and this feature likely contributes to local ecological connectivity. Downstream of the Application Site, this watercourse receives discharges from a series of balancing/settlement ponds associated with residential development in west Hatfield, observed to affect flow rate, and likely to affect water quality.
7. Hedgerows	Local	The two hedgerows in the northern part of the Site are in relatively poor condition and are not 'Important' under the Hedgerow Regulations. They are examples of an HPI and likely contribute to local ecological connectivity.
8. Mature trees	Local	The mature trees on the north and north-west boundaries of the Application Site are limited in number. However, they represent a non-recreatable ecological resource and likely contribute to local ecological connectivity for species associated with trees and woodland.
9. Ponds	Local	Two of the five ponds within the Application Site provide breeding habitat for great crested newt and other amphibians and are therefore examples of the Habitat of Principal Importance 'Ponds'. They are not in good condition due to

		extensive shading, regular drying or heavy grazing of the margins. They provide habitat of value at the local level, where ecologically valuable ponds are likely to be scarce, based on the desk study. The three other ponds was not found to support great crested newts during surveys, and are in poor condition due to grazing/trampling by livestock, shading and/or regular drying.
10. Badger	N/A	Badger is a legally protected species (on animal welfare grounds). It is not of particular conservation significance, being common and widespread in the UK. Being present in proximity to the Application Site boundary, appropriate mitigation measures will be necessary to ensure that development proceeds in accordance with wildlife law. Badgers are included in this assessment for this reason.
11. Bats	Local	The assemblage of bat species, and the number present at the Application Site is not notable in the context of Hertfordshire. However, due to the extent of unlit semi-natural habitats at the Application Site, it does provide a relatively large area of foraging habitat, some potential for tree roosts, and a level of habitat connectivity likely to be significant at the local level.
12. Brown hare	Local	This is a Species of Principal Importance in England, and is identified in the Hertfordshire local Biodiversity Action Plan as a species for which Hertfordshire can contribute to national targets. However, numbers of brown hare <i>Lepus europaeus</i> at the Application Site are considered to be limited, based on observations of only three individuals during extensive baseline ecology survey work carried out in 2016. Brown hare is relatively widespread in north and central Hertfordshire (HNHS, 2018).
13. Harvest mouse	Local	This is a Species of Principal Importance in England. It has not been noted at the site, but has some potential to be present. Areas of grassland among scattered scrub in the west of the Application Site (which is not grazed or mown) may support this species. Its distribution in the UK and Hertfordshire is currently poorly known.
14. Hedgehog	Local	This is a Species of Principal Importance in England. It has not been noted at the site, but has some potential to be present. It is widespread across Hertfordshire (HNHS, 2018), though it is thought to be declining nationally (Harris & Yalden, 2008).
15. Breeding birds	Welwyn Hatfield District	The assemblage of breeding birds at the Application Site is considered typical for the habitats present. Survey work recorded 38 breeding species, including 10 Species of Principal Importance in England, seven amber-listed species and five red-listed species (lapwing, linnet, skylark, song thrush and starling). Two main groups of species are present: the majority nest in scrub, trees or wetland vegetation (e.g. dunnock, song thrush and reed bunting) and two species are ground-nesting species of open habitats such as extensive grassland (skylark and lapwing). There was no evidence of Schedule 1 species breeding at the Application Site, though the site provides suitable foraging habitat for barn owl.

16. Great crested newt	Welwyn Hatfield District	This is a European protected Species, a Species of Principal Importance in England, and a Hertfordshire local BAP species, it is relatively widely distributed in Hertfordshire (HNHS, 2018). The population present at the Application Site is of a moderate size. The two ponds and the stream in which this was recorded are well-connected by suitable terrestrial habitat and are unlikely to form separate populations.
17. Common toad	Local	This species is a Species of Principal Importance in England and is relatively abundant at the Site. The ponds in and around the Site could provide breeding habitat. It is relatively widely distributed in central Hertfordshire (HNHS, 2018).

14.4.2 Features Not Considered Important

Of the designated sites, habitats and species listed in Tables 14.3, 14.4, 14.5 and 14.6 above, those included in Table 14.8 below have been evaluated and found not to be important in the context of this assessment, meaning that they are not considered of conservation importance or they do not have potential to be significantly affected by the Proposed Development. These habitats and species have therefore been scoped out of further assessment.

Table 14.8: Features not considered important in this assessment.

Feature	Justification for scoping out of the impact assessment
Howe Dell LWS & LNR	2.1 km distant from the Application Site, beyond Hatfield. Publically accessible via existing footpaths. The habitat present is not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily available close to the Proposed Development. The round-trip distance of 4.2 km, passing through Hatfield and beyond the A1(M) motorway and no dedicated car park, means that significant numbers of visits from the Proposed Development are unlikely.
Stanborough Reedmarsh LWS	2.3 km distant from the Application Site, beyond the A1(M) motorway. Publically accessible via existing footpaths and a Hertfordshire Wildlife Trust Reserve. Car park present at Stanborough Lakes. The round-trip distance of 4.6 km, passing through Hatfield and beyond the A1(M) motorway and the nature of the habitat present mean that the number of visits from the Proposed Development is likely to be limited.
Oxleys Wood LNR	2.3 km distant from the Application Site, beyond the A1(M) motorway. Publically accessible via existing footpaths. Not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily available close to the Proposed Development. The round-trip distance of 4.6 km, passing through Hatfield and beyond the A1(M) motorway means that significant numbers of visits from the Proposed Development are unlikely.
Colney Heath LNR	2.3 km distant from the Application Site, beyond the A1(M) motorway. Publically accessible via existing footpaths. Not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily available close to the Proposed Development. The round-trip distance of 4.6 km, passing through Hatfield and beyond the A1(M) motorway means that significant numbers of visits from the Proposed Development are unlikely.
The Wick Wood LNR	3.5 km distant from the Application Site, within St Albans. Publically accessible via existing footpaths. Not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily

	available close to the Proposed Development. The round-trip distance of 7 km means that significant numbers of visits from the Proposed Development are unlikely.
Sharrardspark Wood SSSI, LNR	4.1 km distant from the Application Site, beyond the A1(M) motorway. Publically accessible via existing footpaths. Not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily available close to the Proposed Development. The round-trip distance of 8.1 km means that significant numbers of visits from the Proposed Development are unlikely.
Wheathampstead Development Centre LNR	4.2 km distant from the Application Site. Publically accessible via existing footpaths. Not considered particularly susceptible to recreational impacts. Offers greenspace of a type that will be readily available close to the Proposed Development. The round-trip distance of 8.4 km means that significant numbers of visits from the Proposed Development are unlikely.
Symondshyde Great Wood	730 m distant from the Application Site. No public access within the woodland. Not considered particularly susceptible to recreational impacts. Due to the lack of public access, significant numbers of visits from the Proposed Development are unlikely.
Copse South of Symondshyde Great Wood	1.0 km distant from the Application Site. No public access to or within the woodland. Not considered particularly susceptible to recreational impacts. Due to the lack of public access, significant numbers of visits from the Proposed Development are unlikely.
Sleeve Hall Wood	700 m distant from the Application Site. No public access within the woodland. Not considered particularly susceptible to recreational impacts. Due to the lack of public access, significant numbers of visits from the Proposed Development are unlikely.
Copse at Nast Hyde	1.0 km distant from the Application Site. No public access to or within the woodland. Not considered particularly susceptible to recreational impacts. Due to the lack of public access, significant numbers of visits from the Proposed Development are unlikely.
Hook's Wood	1.0 km distant from the Application Site. No public access within the woodland. Not considered particularly susceptible to recreational impacts. Due to the lack of public access, significant numbers of visits from the Proposed Development are unlikely.
Poor semi-improved grassland	A common and widespread habitat of limited inherent ecological value, due to its limited species-richness and the fact that its component species are themselves mainly widespread and common.
Broadleaved plantation woodland	A common and widespread habitat of limited inherent ecological value, due to the lack of mature tree and lack of well-developed understory vegetation or ground flora.
Hardstanding	A common and widespread habitat of low inherent ecological value.
Plants	No protected species or species / assemblages of significant conservation value are likely to be present at the Application Site.
Water vole	Likely absent from the Application Site.
Otter	Likely absent from the Application Site.
Common reptiles	Likely absent from the Application Site.
Invertebrates	No protected species or species / assemblages of significant conservation value are likely to be present at the Application Site.

14.5 ASSESSMENT OF EFFECTS

14.5.1 Ecology Strategy and Designed-in Ecology Mitigation

As detailed in Chapter 3 and referred to in the Introduction above, the Proposed Development includes an Ecology Strategy which includes various designed-in ecology mitigation. Such mitigation is an integral part of the Proposed Development and has been viewed as such in the assessment of potential effects which follows.

14.5.2 Construction Effects

Potential significant effects on important ecology and nature conservation features resulting from the construction phase of the Proposed Development are listed in Table 14.9 below.

Table 14.9: Potential significant effects.

Effect	Possible Causes/Mechanisms
Habitat loss	Intentional or accidental felling of trees, removal or disturbance of vegetation or soils by heavy plant, materials storage / stockpiling etc. during site preparation and construction.
Habitat degradation	Pollution by dust, fuels, lubricants, hydraulic fluid, cement or silt resulting in toxic effects to plants/animals. Damage to soils or vegetation by physical damage, soil compaction (resulting in changes in flora), change in hydrology resulting in the drying of wetland areas or reductions in local populations of wetland animals or plants.
Habitat fragmentation	Temporary or permanent reduction in habitat connectivity through severance of habitat corridors or isolation of patches of habitats, e.g. by severance of hedgerows or the removal/felling of plantation woodland, installation of features or land-use that presents a barrier or hostile environment (such as a roads, urban areas, bridges or culverts).
Killing, injury, or disturbance of animals	Digging, vegetation/tree removal, movement of vehicles/heavy plant, and entrapment of animals in trenches, pits or pipes.
Displacement of animals	Visual, noise or vibration-related disturbance from vehicles/heavy plant, lighting, digging or piling. Habitat loss and degradation (see above) may also displace resident animals.

Table 14.10 b describes the potential significant effects resulting during the construction and occupation phases of the Proposed Development for each of the Important Ecological Features identified previously in Table 14.7 and the likely impacts are presented and characterised, where appropriate, in terms of their extent, magnitude, duration, frequency, timing and reversibility. This evaluation takes into account the mitigation described under *Designed-in Ecology Mitigation* above. All necessary additional mitigation is described in a subsequent section.

Table 14.10: Potential effects resulting from the construction phase of the Proposed Development.

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
1. Symonds-hyde Great Wood LWS and Ancient Woodland	Habitat degradation.	Dust emissions.	This designated site is located 730 m north-west of the Application Site, and construction works at the Application Site are not anticipated to create significant dust emissions. Therefore no adverse effect is anticipated on this designated site.	Neutral	N/A	Not significant.
2. Home Covert and Round Wood LWS	Habitat loss or degradation.	Physical damage during site clearance or construction.	The design of the Proposed Development will avoid the direct loss of this woodland, and will provide a buffer of 30 m minimum width of retained or planted native vegetation between the LWS and developed areas of the Site. No direct habitat loss is therefore anticipated, but since this LWS is directly adjacent to the Application Site, without adequate fencing protection there is some (low) risk of accidental incursion by machinery during construction, leading to damage to woodland soils and vegetation.	Adverse	Local / minor	Significant
		Dust emissions.	This designated site is located adjacent to the east of the Application Site. However, there will be a 30 m buffer of natural vegetation, and construction works and construction works at the Application Site are not anticipated to create significant dust emissions. Therefore no adverse effect is anticipated from dust emissions on this designated site.			
3. Semi-improved neutral grassland	Habitat loss or degradation.	Intentional grassland removal to allow construction.	The Proposed Development retains 11.7 ha of a total of 34.2 ha of this habitat at the Application Site. Therefore 22.5 ha of this habitat will be lost. Since this habitat is considered of ecological value at the level of Welwyn Hatfield District, the loss of 65 % of this habitat is considered to result in an impact at the district level. Since the retained area of this habitat will be put into conservation management (see the section <i>Designed-in Mitigation</i> , above), is assumed that the retained area will maintain or improve in ecological value.	Adverse	District / Moderate	Significant
		Accidental physical damage during site clearance or construction.	Since the retained grassland is within the Application Site, without adequate fencing protection there is some risk of accidental incursion of retained grassland habitats by machinery during construction, leading to temporary damage to this habitat.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
		Dust emissions.	Construction works and construction works at the Application Site are not anticipated to create significant dust emissions. Semi-improved neutral grassland is not considered to be particularly susceptible to impacts from soil dust. Therefore no adverse effect is anticipated from dust emissions on this habitat.			
	Reduction in habitat connectivity.	Intentional grassland removal to allow construction.	The retained area of grassland will form a block along the south-west margin of the Site. This will retain good habitat connectivity to existing open grassland habitats to the south-west of the Site. (These habitats outside the Application Site will be lost to the proposed quarry development in the future, but will be restored to grassland and open habitats following quarrying works).			
4. Scrub	Habitat loss or degradation.	Intentional scrub removal to allow construction.	The Proposed Development will involve the intentional removal of scattered and dense scrub across an area of approximately 5 ha, mainly in the north of the Application Site. The Proposed Development will maintain a habitat corridor at the west of the site with includes extensive scrub, maintaining north-south connectivity of this habitat at the Site.	Adverse	Local / Minor	Not significant.
		Physical damage during site clearance or construction.	Since the retained scrub is within the Application Site, without adequate fencing protection there is some risk of accidental incursion of retained scrub habitats by machinery during construction, leading to temporary damage to this habitat.			
		Dust emissions.	Construction works at the Application Site are not anticipated to create significant dust emissions. Scrub is not considered to be particularly susceptible to impacts from soil dust. Therefore no adverse effect is anticipated from dust emissions on this habitat.			
5. Semi-natural broadleaved woodland	Habitat loss or degradation	Physical damage during site clearance or construction	The Proposed Development will retain all of this habitat at the Application Site. No direct habitat loss is therefore anticipated. However, since this habitat is within the Application Site, without adequate fencing protection there is some (low) risk of accidental incursion by machinery during construction, leading to damage to woodland soils and vegetation.	Adverse	District / Moderate	Significant
		Dust emissions.	Construction works at the Application Site are not anticipated to create significant dust emissions. Semi-mature natural woodland is not considered to be particularly susceptible to impacts from soil dust.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
			Therefore no adverse effect is anticipated from dust emissions on this habitat.			
6. Ellenbrook	Increase in extent of river habitat	De-culverting of Ellenbrook.	The Proposed Development includes the de-culverting of ca. 140 m of the Ellenbrook, which is currently culverted under part of the former Hatfield airfield. The new section of river corridor will be landscaped to provide river corridor habitat dominated by native vegetation. The current section of the Ellenbrook within the Application Site will be retained within an associated green corridor of native vegetation.	Neutral	N/A	Not significant
	Increase in habitat connectivity		The new section of river corridor will form part of a wider east-west green corridor in the north of the Application Site. It will provide increased local ecological connectivity.			
	Habitat loss or degradation	Physical damage during site clearance or construction	The Ellenbrook will be surrounded by buffers of grassland/scrub/attenuation features at least 6 m in width from the bank top, and in most areas significantly more than this. However, since the retained river habitat is within the Application Site, without adequate fencing protection there is some risk of accidental or intentional incursion of retained river habitats by machinery during construction, leading to temporary damage to this habitat.			
7. Hedgerows	Habitat loss, degradation.	Intentional hedgerow removal and breaches during site clearance and construction.	The Proposed Development will cause the loss of the majority of the hedgerow on the northern boundary of the Application Site. Estimated at up to 150 m in total. This hedgerow is species-poor and is not 'Important' under the Hedgerow Regulations 1997. The hedgerow along the north-western boundary of the Application Site (which is species-rich but not 'Important') will be retained and will form part of a green corridor.	Adverse	Local / Minor	Significant
		Accidental physical damage during site clearance and construction	Without adequate fencing protection there is some risk of accidental damage to the retained hedgerow by machinery during construction, leading to damage to this habitat.			
		Dust emissions.	Construction works at the Application Site are not anticipated to create significant dust emissions. Hedgerow is not considered to be particularly susceptible to impacts from soil dust. Therefore no adverse effect is anticipated from dust emissions on this habitat.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
	Loss of habitat connectivity	Hedgerow breaches during construction.	The loss of the hedgerow along the northern boundary of the Application Site is likely to have a limited effect on local habitat connectivity. This is because a parallel hedgerow, north of Cooper's Green Lane, will remain and will not be affected by the development, and because an east-west green corridor (comprising the de-culverted Ellenbrook, and grassland, scrub and trees will be created in the north of the Proposed Development, providing continued east-west ecological connectivity across the northern part of the Site.			
8. Mature trees	Loss	Intentional felling.	The propose development is not anticipated to result in the felling of any mature or veteran trees.	Adverse	Local / Minor	Not significant
	Loss or degradation	Encroachment of root zones, and/or arboricultural works.	The Proposed Development is not anticipated to result in the intentional encroachment of root zones of mature trees. There is some potential for accidental encroachment during construction and landscaping works.			
		Accidental physical damage during site clearance or construction.	Without adequate fencing protection there is some (low) risk of accidental damage to the mature trees by machinery during construction, leading to damage.			
9. Ponds	Increase in area of pond habitat / number of ponds.	Creation of four new ponds	The Proposed Development includes the creation of four new ponds within the Application Site, having a primary purpose of Nature Conservation. It is anticipated that these will more than compensate for the two ponds to be lost (see below), resulting in an overall increase in the ecological value of pond habitat at the Application Site.	Beneficial	Local / Minor	Not significant
	Habitat loss, degradation or fragmentation.	Intentional in-filling/removal of ponds	The Proposed Development will result in the loss of two of the four ponds at the Site. One is a pond towards the centre of the Site that is in poor condition due to being shallow, heavily trampled and grazed by cattle and shaded by willow scrub, it supports filamentous algae and almost no marginal or no aquatic macrophytes. It is not a Habitat of Principal Importance in England.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
			The second pond is a shallow balancing pond close to the eastern boundary of the Site, located in dense shade and with little vegetation present. Great crested newt was observed here during surveys in 2016, making this pond a Habitat of Principal Importance in England.			
		Physical damage during site clearance or construction.	Without adequate fencing protection there is some risk of accidental damage/infilling of the two retained ponds by machinery during construction.			
		Changes to hydrological regime.	The two retained ponds at the Site appear to result from the collection of surface water on areas of impeded drainage (clay-rich soils are present in parts of the Site). Water levels in these ponds are therefore unlikely to be closely linked to ground water. There is no evidence of any dependence of these ponds on any local surface water drainage system (i.e. there are no visible inflow pipes). Given that the two retained ponds will be set within an extensive area of retained grassland (thus maintaining surface water inputs), no significant alteration to their hydrological regime is likely to result from the Proposed Development, and no adverse impact is therefore anticipated.			
		Pollution.	Given that the two retained ponds will be set within an extensive area of retained grassland, no increased risk of pollution inputs is anticipated.			
	Increase in habitat quality of ponds	Ecology-focused management	The two retained ponds at the site will be subject to ecology-focused management, to include fencing out cattle (to allow regeneration of marginal vegetation and reduce trampling) and reduction of surrounding scrub to reduce shading. This will increase the habitat quality of these ponds.			
10. Badger	Killing or injury or disturbance of a nationally protected species and damage or destruction of its setts.	Site clearance and construction.	The Proposed Development will involve works within 20 m of one active badger sett, located to the east of the Application Site. This sett comprises one entrance hole with signs of recent digging. No other signs were found in the vicinity of this, indicating that the sett is not a main set tor used by large number of badgers. A further sett to the (not in any danger of being affected by works at the Application Site) is present around 50 m to the north of this).	Potential breach of wildlife legislation.	N/A	N/A

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
			Without appropriate licensed mitigation during digging, piling or similar works within 20 m of the sett, there is potential for killing and injury of badgers, damage to a badger sett and disturbance of badgers occupying a sett. These are all offences under the Protection of Badgers Act 1992. There is not considered to be any effect on the local conservation status of badger (since it is common locally, regionally and nationally) during the construction phase, but without appropriate mitigation there is potential for breaches of wildlife legislation.			
11. Bats	Reduction in population of European Protected species through reduction in foraging opportunities.	Intentional removal of grassland, woodland, scrub, hedgerow, and ponds.	The Proposed Development will result in a reduction in the total area of foraging habitat for bats at the Site. However, there will be an increase in the extent of wetland habitats (i.e. two additional wildlife ponds, three balancing ponds, and 140 m of new stream habitat), which are of particular value in providing foraging opportunities for bats. Given the limited use of the Application Site by bats, and given the extent of foraging opportunities in the local area (e.g. extensive woodland to the north and west), this reduction could have an adverse effect on bat populations at the local geographic scale.	Adverse	District / Moderate	Significant
		Increased light spillage onto above habitats due to floodlighting during construction	Light spillage from floodlighting used during construction on to retained habitats has the potential to reduce the value of these habitats as bat foraging habitat. Given that this foraging habitat has been valued at the district scale, this effect could potentially affect bat populations at the district scale.			
	Reduced population of European Protected species through reduction in roosting opportunities.	Tree felling or arboricultural works	No tree felling (or an increase in arboricultural works carried out for reasons of public safety) is anticipated in the Proposed Development. Therefore no direct loss of roosting habitat is anticipated.			
		Light spillage onto mature trees from floodlighting during construction.	Light spillage on to potential tree roosts on the northern and north-western boundaries of the Application Site from floodlighting during construction could cause a loss of a relatively small number of tree roosts, likely to be of significance at the local scale.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
	Increased population of European Protected species through increase in roosting opportunities.	Provision of integrated bat roosting sites in new buildings.	The Ecology Strategy includes the provision of bat roosting sites in new buildings in the form of bat boxes (totalling 5% of the number of new dwellings/apartments) integrated into the fabric of buildings in appropriate locations. This will significantly increase the number of roosting opportunities in the local area. Given the large extent of foraging habitats that will remain at the Application Site in the Proposed Development, and in areas to the west of the application Site, and the limited number of roosting opportunities (which are likely to be mainly limited to trees) in the local area, the number of roosting sites is likely to be the limiting factor determining the size of local bat populations. The increase in roosting sites resulting from the Proposed Development is therefore likely to increase local bat populations.			
	Reduced population of European Protected species caused by habitat fragmentation (loss of commuting routes).	Intentional removal of grassland, woodland, scrub, hedgerow, and ponds.	Given the extent of habitat retention and green corridors in the Proposed Development, no habitat fragmentation through direct habitat loss is anticipated.			
		Light spillage on to above habitats from floodlighting during construction.	Light spillage from floodlighting during construction onto green corridors at the east and west of the Application Site, and along the east-west green corridors that will cross the Proposed Development, there is potential for the loss of connectivity between the woodland habitats to the west and the wetland habitats (balancing ponds and Ellenbrook) to the east. Given the moderate numbers of bats present in the vicinity of the Site, this could cause an adverse effect at the local level.			
	Reduced population of European Protected species caused by killing and injury of individuals.	Tree felling.	No tree felling (or an increase in arboricultural works carried out for reasons of public safety) is anticipated in the Proposed Development. Therefore there is not potential for increased killing or injury of individuals.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
12. Brown hare	Reduced population of a SPI through loss of habitat.	Intentional removal of grassland habitat.	The Proposed Development will cause the loss of the majority of habitat suitable for brown hare (i.e., grassland) at the Application Site, although the retained area of grassland in the south and south-west will be of a suitable size to retain this species (given suitable habitat connectivity with other areas of suitable habitat). Given the extent of arable habitat in the vicinity of the Site (which is likely to be suitable, though sub-optimal for this species) and the fact that this species is relatively widespread in the district, effect is likely to be adverse at the local level.	Adverse	Local / Minor	Not significant
	Reduced population of a SPI through habitat fragmentation.	Intentional removal of grassland habitat.	Habitat connectivity between retained grassland habitat in the south and south-west of the Application Site and the extensive open habitats beyond the south-west of the Application Site will be maintained in the Proposed Development. However, these habitats south-west of the site are likely to be lost due to proposed quarrying works. The arable area immediately to the north are also likely to be lost due to quarrying. Since habitat connectivity for this species is limited in other directions (limited to the west by woodland, and to the north by the new residential areas in the Proposed Development) there is a possibility that this species will be lost from the local area (i.e. the Application Site plus the quarry sites) over this time period.			
	Reduced population of a SPI through killing and injury of individuals.	Site clearance and construction.	Given the mobility of this species, adults are unlikely to be killed or injured during site clearance. Young (present in the period February to September) could be killed or injured (or displaced from their mother). Given that the construction phase is likely to take place over a number of years, such effects are likely to be limited to small numbers that are likely to have a negligible effect on the local population of this species.			
13. Harvest mouse	Reduced population of a SPI through loss of habitat.	Site clearance and construction.	The Proposed Development will maintain extensive areas of habitat suitable for this species in the west of the Site and along the Ellenbrook in the east. However, areas of scattered scrub and unmanaged grassland in the north-west will be lost.	Adverse	Site / Minor	Not significant
	Reduced population of a SPI through	Intentional removal of grassland/scattered scrub habitat	Due to the extensive area of retained habitat and green corridors (which will include grassland habitats) on the western and eastern boundaries of the Proposed Development, and along the de-culverted section of the			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
	habitat fragmentation.		Ellenbrook in the north, no reduction in habitat connectivity at the Application Site as a whole, or at the local level is anticipated.			
	Reduced population of a SPI through killing and injury of individuals	Site clearance and construction.	Incidental killing and injury of harvest mouse is expected to occur during site clearance works. This will not cause any breach of wildlife legislation and, in the context of the proposed habitat creation and the phased nature of the Proposed Development, is expected to have a negligible effect on the local population of this species.			
14. Hedgehog	Reduced population of a SPI through loss of habitat.	Intentional removal of grassland and scrub habitats.	The Proposed Development will maintain extensive areas of habitat suitable for this species in the south and west of the Application Site, and along the eastern and western boundaries. However, there will be a reduction in the overall area of suitable habitat, and hence a likely reduction in the population within the Application Site.	Adverse	Site / Minor	Not significant
	Reduced population of a SPI through habitat fragmentation.	Intentional removal of grassland and scrub habitats.	The retention of green corridors on the eastern and western boundaries, and east-west across the Application Site mean that habitat connectivity for this species is unlikely to be reduced across the Application Site as a whole, or at the local level.			
	Reduced population of a SPI through killing and injury of individuals	Site clearance and construction.	Incidental killing and injury of hedgehog during site clearance works is possible. This will not cause any breach of wildlife legislation and, in the context of the proposed habitat creation and the phased nature of the Proposed Development, is expected to have a negligible effect on the local population of this species.			
15. Breeding birds	Reduction in breeding habitat at the Application Site.	Intentional removal of grassland, scrub, hedgerow and woodland habitats during site clearance and construction.	<p>The Application Site currently supports two different bird communities: ground-nesting birds of open grassland, including skylark and lapwing, and more general scrub/garden/woodland/rough grassland species such as song thrush and dunnock. The Proposed Development will reduce the area of both of these habitats at the Application Site.</p> <p>Open grassland will be maintained in the form of the large block of retained grassland area in the south and west of the Application Site, and a strip at the east. The size of this habitat should allow it to retain some suitability for skylark, though there would likely be reduction in the</p>	Adverse Potential breach of wildlife legislation.	District / Moderate	Significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
			<p>number of breeding pairs. Based on the result of the breeding bird characterisation survey, this reduction is estimated to be from 16 to around 4–8 pairs. The reduced size of the retained grassland in the south of the Application Site may reduce its value for lapwing, to the extent that this species may no longer occur or breed there. This would result in the loss of breeding habitat for up to two pairs. The reduction in the area of grassland will also reduce the area of foraging habitat available for barn owl, by up to around 75%. Under the Proposed Development, lapwing is unlikely to continue to breed at the Application Site, resulting in the loss of two pairs.</p> <p>Habitat availability for the more generalist species will be maintained along the green corridors in the east and west of the Application Site, and along the new green corridor along the de-culverted Ellenbrook. In total there may be an overall change of between +25% and -25% (estimated based on professional judgement) in the number of territories of these species, once the habitat provided by new planting, wildlife ponds, balancing ponds, residential gardens, and in-built bird boxes (totalling 5% of all new residences/apartments) is taken into account. There will also likely be a change in the species composition of this generalist community, with the new habitats favouring species associated with scrub or gardens (such as blackbird, song thrush and dunnock) rather than those associated within rough grassland or agricultural habitats, such as linnet.</p>			
	Loss of habitat connectivity	Intentional removal of grassland, scrub, hedgerow and woodland habitats during site clearance and construction.	The dispersal of some bird species, such as reed bunting and dunnock is likely to be restricted to suitable types of habitat which provide an appropriate level of cover. However, since the Proposed Development will maintain corridors of scrub and grassland at the east and west of the Application Site, and will provide a new east-west habitat corridor along the de-culverted Ellenbrook, there will be no loss of habitat connectivity at the site level or above for bird species.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
			Because the retained grassland will be in one block, and because of the extent of habitat corridors mentioned above, no loss of connectivity at the level of individual bird territories is anticipated.			
	Killing or injury of individual birds and damage or destruction of active nests.	Clearance and construction.	<p>There is potential for the killing and injury of individual birds and damage or destruction of their nests during vegetation clearance and felling or other works to trees. This will lead to a breach of wildlife legislation.</p> <p>There no potential for breaches of legislation relating to species listed on Schedule I of the Wildlife and Countryside Act 1981 (as amended).</p>			
16. Great crested newt	Change in size of size of a European Protected Species through change in the extent of habitat.	Intentional removal of ponds or terrestrial habitats during site clearance and construction.	<p>This species is present in its aquatic phase (and breeds) in two of the five ponds that are present at the Application Site, and is present (though it is unknown if breeding is successful) in the Ellenbrook (which is relatively slow-flowing within the Application Site). All of these waterbodies will be retained at the Application Site, with extensive areas of adjacent terrestrial habitat. The ecology strategy specifically includes the improvement of habitat for this species within and around the two ponds. The ecology strategy includes the creation and ongoing management of two ecology-focused ponds in the west of the Site which will provide new breeding habitat for this species. There will be good connectivity between these ponds and the existing two ponds at the south of the Site. The total extent of breeding habitat for this species will therefore increase in the Proposed Development.</p> <p>The extent of suitable terrestrial habitat within 250 m of the existing ponds will be reduced in the Proposed Development. However, given the proposed habitat retention within at least 50 m of the ponds, and in most areas, much more, and the proposed habitat improvements, it is considered likely that the population of this species at the Site will increase.</p>	Neutral Potential breach of wildlife legislation.	N/A	Not significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
	Reduced population of a European protected species through habitat degradation.	Pollution or physical damage to ponds or terrestrial habitat during site clearance and construction.	Without adequate pollution prevention measures, there is some risk of pollution of ponds from concrete, silt, or oil discharges via surface water. Without adequate fencing protection during construction there is some risk of physical damage to ponds and adjacent terrestrial habitat.			
	Reduced population of a European protected species caused by habitat fragmentation	Reduced habitat connectivity between ponds due to intentional habitat removal during Site clearance and construction.	<p>Habitat connectivity between the existing two pond that support this species will be unaffected by the Proposed Development, because both are within the retained grassland area. Connectivity between these ponds and the Ellenbrook at the north-east of the Application Site will be maintained by the green corridor to be retained at the east of the Application Site.</p> <p>Connectivity between breeding habitat for this species at the Application Site and breeding habitat in ponds to the south-west will not be affected by the Proposed Development, although these off site ponds will be removed during the proposed quarrying works there (though replaced with compensatory ponds in the quarry restoration phase).</p> <p>Connectivity between breeding habitat for this species at the Application Site and breeding habitat in ponds to the north-west of the will be maintained by the green corridor to be retained at the west of the Application Site and the east-west habitat corridor to be created by de-culverting the Ellenbrook.</p>			
	Reduced population of a nationally protected species caused by killing and	Site clearance and construction	<p>Clearance of vegetation (primarily grassland, scrub and hedgerows, and any associated clearance of grassy field margins) could cause the killing or injury of great crested newt.</p> <p>Killing or injury of newts could have a temporary adverse effect on the population of this species at the local level, but given the limited extent of</p>			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Construction Phase	Effect	Scale and Severity	Significance
	injury of individuals.		good terrestrial habitat to be cleared, and the extent of new terrestrial and breeding habitat to be provided, it is considered unlikely to lead to a permanent reduction in population size or to affect the local favourable conservation status of this species.			
17. Common toad	Reduced population size of a SPI through reduction in the amount of habitat present		As per great crested newt above, existing breeding habitat will be unaffected. New breeding habitat will be created (i.e. two wildlife-focused ponds). There will be a decrease in the total area of terrestrial habitat, but habitat in the vicinity of ponds will be retained and will increase in its quality through management. Overall, no change in the local population size of this species is anticipated.	Neutral	N/A	Not significant
	Reduced population of a SPI through habitat degradation.		Without adequate pollution prevention measures, there is some risk of pollution of ponds from concrete, silt, or oil discharges via surface water. Without adequate fencing protection during construction there is some risk of physical damage to ponds and adjacent terrestrial habitat.			
	Reduced population of a SPI caused by habitat fragmentation (reduced habitat connectivity between ponds).		As per great crested newt above, no reduction in connectivity between breeding habitat at the level of the Site or above is anticipated.			
	Reduced population of a SPI caused by killing and injury of individuals.		As per great crested newt above, killing or injury of individuals could occur during site clearance and construction, but in the context of the proposed habitat retention, creation, and management, is unlikely to affect the local population size of this species.			

14.5.3 Operational Phase Effects

Potential significant effects on important ecology and nature conservation features resulting from the occupation phases of the Proposed Development are listed in Table 14.11 below.

Table 14.11: Potential significant effects.

Effect	Possible Causes/Mechanisms
Habitat degradation	Increased recreational pressure (e.g. damage to vegetation, compaction/disturbance of soils) on habitats. Management/gardening of vegetation close to gardens (causing damage to habitats). Fly tipping of litter or polluting materials by new residents. Introduction of invasive species by new residents. Light spillage from street lighting or other artificial lighting.
Habitat fragmentation	Reduction in habitat connectivity through road traffic, permanent changes of land use and permanent structures or barriers. Light spillage from street lighting or other artificial lighting.
Killing, injury, disturbance or displacement of animals.	Killing or injury of animals by collisions with traffic. Additional traffic, new roads and paths. Increased predation pressure or disturbance from cats and dogs.
Reduction in animal populations	Permanent loss of habitat. Increased predation pressure or disturbance from cats and dogs.
Displacement of animals	Visual (especially lighting), noise or vibration-related disturbance. Habitat loss and degradation (see above) may also displace resident animals. Light spillage from street lighting or other artificial lighting.

Tables 14.12 describes the potential significant effects resulting during the occupation phase of the Proposed Development for each of the Important Ecological Features identified previously in Table 14.7 and the likely impacts are presented and characterised, where appropriate, in terms of their extent, magnitude, duration, frequency, timing and reversibility. This evaluation takes into account the mitigation described under *Designed-in Ecology Mitigation* above. All necessary additional mitigation is described in a subsequent section.

Table 14.12: Potential effects resulting from the occupation phase of the Proposed Development.

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
1. Symond-hyde Great Wood LWS and Ancient Woodland	Habitat degradation	Increased recreational pressure.	This designated site, which supports ancient replanted woodland, is located 0.74 km distant from the Application Site, and 1.05 km from proposed residential areas via the shortest walking route, which includes 0.82 km along a busy road with no pavement (Coopers Green Lane). There is no official public access within the woodland except for one public footpath, which is 1.7 km from the Application Site at its closest point (again accessed along Coopers Green Lane for 815 m). Ancient replanted woodland habitat is not considered especially susceptible to recreational impacts (unlike heathland supporting ground nesting birds, for example). Also, the woodland offers greenspace of a type that will be readily available close to the Proposed Development along the various green corridors. Therefore, recreational impacts on this LWS are considered unlikely.	Neutral	N/A	Not significant
2. Home Covert and Round Wood LWS	Habitat degradation	Increased recreational pressure.	This designated site, which supports mature woodland, is located directly adjacent to the west of the Application Site, and 60 m from the closest proposed residential areas, separated via the green corridor along the western boundary of the Site. There is currently no official public access within the woodland, although there is a permissive path along the western edge. Woodland habitat is not considered especially susceptible to recreational impacts (unlike heathland supporting ground nesting birds, for example), although there is some potential for trampling of ground flora, littering and fly-tipping. The Proposed Development would put a large residential population within 30 m to 1 km of this designated site. Currently there is a large residential population at west Hatfield, 0.97 km to the east of the woodland. There is therefore potential for increased (albeit unauthorised) public access to the woodland and hence a resulting increase in recreational pressure at this site, potentially resulting in physical damage to the woodland ground flora. However, the Proposed Development includes the provision of a buffer of at least 30 m of woodland planting between the designated site and any	Adverse	District / moderate	Significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
			developed area of the Site and proposed ditches make the shortest route 60 m. Without appropriate fencing or other access management, a moderate increase in recreational pressure at this designated site, resulting in a limited effect on the nature conservation value of the Site.			
3. Semi-improved neutral grassland	Habitat degradation	Increased recreational pressure.	The semi-improved neutral grassland that will be retained in the south of the Proposed Development is likely to include some public footpaths, to allow access to green space on foot or bike. Such routes are likely to include circular walks and possibly links to the wider public footpath network. They will not be major walking routes for access to or between facilities within or outside the new development. Grassland habitat is not considered especially susceptible to recreational impacts (impacts on ground nesting birds are considered separately below). The likely increase in recreational pressure is therefore expected to have a minimal effect on this habitat, which will be outweighed by the positive conservation management of this habitat that is included in the Ecology Strategy.	Adverse	Local / minor	Not significant
		Poor management.	Without a suitably detailed conservation management regime for retained grassland in the Proposed Development, there is a risk of lack of management (eventually resulting in the formation of dense scrub or excessive mowing or grazing of vegetation (resulting in the development of amenity lawns of low ecological value).			
4. Scrub	Habitat degradation	Poor management.	Without a suitably detailed conservation management regime for scrub in the Proposed Development, there is a risk of lack of management (eventually resulting in the formation of dense shaded areas of scrub, or excessive scrub removal, both of which would lead to a reduction in biodiversity value.	Adverse	Site / Minor	Not significant
5. Semi-natural broadleaved woodland	Habitat degradation	Increased recreational pressure.	The small area of mature ash woodland in the west of the Application Site currently has no public access. It is located 10 m from proposed residential areas. The ground flora here is of limited value, being dominated by common nettle. As noted above, woodland habitat is not considered especially susceptible to recreational impacts, although there is some potential for trampling of ground flora, littering and fly-tipping.	Adverse	Site / Minor	Not significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
			Without appropriate fencing or other access management, a moderate increase in recreational pressure here is likely, resulting in a limited effect on the habitat value of this woodland. This is limited by the lack of ancient woodland ground flora in this woodland.			
		Poor management.	Without a suitably detailed conservation management regime for this woodland there is a risk of inappropriate management lack of management (eventually resulting in the formation of dense canopy, scrub corridors along these features which will reduce their biodiversity value) or excessive mowing of vegetation (resulting in the development of amenity lawns of low ecological value).			
6. Ellenbrook	Habitat degradation due to pollution	Pollution	The Ellenbrook will be surrounded by buffers of grassland/scrub/attenuation features at least 6 m in width from the bank top, and in most areas significantly more than this. This buffer makes direct overland pollution (e.g. from spillages) unlikely. However, due to the potential for increased surface water flows, and the replacement of grassland with urban habitats (especially road), and this discharge of surface water into the Ellenbrook, there is some potential for a reduction in water quality within the stream, including increased levels of turbidity, silt, tyre residues, oil, detergents and household pollutants. These potential impacts have been considered in the context of the current baseline conditions of pulsed discharges of surface water (treated in settlement ponds) just downstream of the Site, and the fact that discharged water will be subject to treatment via settlement ponds in the Proposed Development.	Adverse	Local / Minor	Not significant
		Changes to hydrological regime due to drainage works.	Due to the drainage infrastructure associated with the Proposed Development, there is potential for a reduction in the water table in the vicinity of the Ellenbrook and hence a reduction in typical water flows (and especially flows in summer or during periods of drought). There is also potential for increased flow rates during periods of heavy rainfall due to reduced rainfall infiltration in the vicinity/upstream of the Ellenbrook, and hence greater surface water flows. These potential impacts have been considered in the context of the baseline conditions of variable flow within the stream (in part due to pulsed discharges of surface water just			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
			downstream of the Site), and drying of the stream just downstream of the Application Site during low rainfall conditions. Potential hydrological changes and pollution impacts are considered to be compensated for by some extent by the de-culverting of 140m of the Ellenbrook, resulting in additional habitat and therefore only a local/minor adverse effect on this feature overall.			
		Introduction of non-native species	The Proposed Development would put residential populations (and gardens) within tens of metres of the Ellenbrook, and footpaths adjacent within metres. There is therefore some potential for non-native species (primarily wetland plants) to be introduced (such as by the intentional dumping of garden and aquarium wastes and by unassisted spread from gardens). The effects of this could reduce the ecological value of this watercourse.			
		Increased public access.	There is considered likely to be an increase in public access to at least some parts of watercourses at the Site. Given the proposed buffers this is likely to have a limited effect on the value of these habitats.			
		Poor management	Without a suitably detailed conservation management regime for the Ellenbrook and its adjacent vegetation in the Proposed Development, there is a risk of lack of management (eventually resulting in the formation of dense shaded scrub corridors along this features which will reduce its biodiversity value) or excessive mowing of vegetation (resulting in the development of amenity lawns of low ecological value).			
7. Hedgerows	Degradation in habitat value.	Poor management	Without a suitably detailed conservation management regime for retained hedgerows and their adjacent buffer strips of rough grassland in the Proposed Development, there is a risk of lack of management (eventually resulting in tall spindly shrubs, offering little cover near ground level, which will reduce their biodiversity value) or excessive (i.e. annual) cutting which will largely prevent fruiting or flowering, and will limit their structural complexity.	Adverse	Site / Minor	Not significant
8. Mature trees	Degradation in habitat value	Increased levels of arboricultural management.	Mature trees may be subject to increased arboricultural management due to the health and safety concerns of management authorities, however, given that Application Site is currently open to the public (as	Neutral	N/A	Not significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
			Ellenbrook Fields), and had a busy public road along its northern boundary, no significant change is anticipated.			
		Damage (including to rooting zone) by gardening/landscape management	The mature trees at the Application Site are all situated within areas of retained green corridor, which will support habitats such as grassland and scrub. No significant effect is therefore anticipated.			
9. Ponds	Habitat degradation due to pollution.	Pollution incident within development, carried to ponds via surface water.	The retained ponds will be separated from developed areas by a minimum of 10 m of retained/new terrestrial habitat. This buffer makes direct overland pollution (e.g. from spillages) unlikely.	Adverse	Site	Not Significant
		Increased public access and recreational pressure at ponds.	Without appropriate fencing or access management, there will likely be an increase in public access to some of the retained/new ponds, and there is some potential for damage via trampling, litter, and fly tipping.			
10. Badger	Reduced population of a protected species caused by killing and injury of individuals.	Increased numbers of collisions with road vehicles.	Badgers are a common and widespread species, protected for reasons of animal welfare rather than for reasons of nature conservation. Any increase in deaths or injury caused by increased numbers of collisions with road vehicles are not anticipated to have a significant effect on local badger populations.	Neutral	N/A	Not significant
11. Bats	Reduced population of European Protected species through degradation of foraging, roosting or	Increased levels of light pollution due to external lighting.	Currently, light pollution at the Site is limited, due the lack of buildings or street lighting, although the sports pitches close to the south-east are floodlit. The design of the Proposed Development will provide vegetated corridors of habitat suitable for foraging and commuting bats in a north orientation along the western and eastern boundaries of the Site, and also an east-west corridor along the de-culverted Ellenbrook. There is also a corridor of hedgerow vegetation long the northern side of Coopers Green Lane adjacent to the north. However, without specific mitigation to minimise	Adverse	Local / Minor	Not significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
	commuting habitat.		light spill from external lighting (especially from street lighting), a reduction in the value of these corridors is likely to occur. This light spill may be from surrounding residential areas and also from the main access roads.			
	Reduced population of European Protected species caused by killing and injury of individuals.	Increased numbers of collisions with road vehicles.	The main access road in the Proposed Development passes through the centre of the proposed residential and development areas, thus limiting the potential for bats (foraging and commuting along green corridors) to come into contact with vehicles, although this access road will pass over the east-west (de-culverted Ellenbrook) habitat corridor on one location. Other new roads will be minor access roads. Due to the low average speeds of these roads, no effect on bat populations is anticipated from collisions. Given the limited population of bats at the Site, and the limited number of such crossings (estimated to be eight in number) the overall effect on the conservation status of bats is anticipated to be very limited.			
12. Brown hare	Reduced population of a SPI caused by killing and injury of individuals.	Increased numbers of collisions with road vehicles.	Due to the low average speed of traffic using local access roads, and because these roads are within urban or residential areas, these are not considered to pose a risk to brown hare. However, killing or injury of individual brown hare is likely to be rare occurrence in the Proposed Development, and this is not expected to have a significant effect on the local population, which will already be reduced due to a reduction in the availability of suitable open habitats at the Site.	Adverse	Local / Minor	Not significant
	Reduced population of a SPI caused by killing, injury or displacement of individuals.	Increased predation pressure from increased populations of domestic cats.	Without careful design of the pedestrian and cycle path network within areas of green space, taking into account the requirement for brown hare to have access to large, open, relatively undisturbed areas of grassland, recreational disturbance is likely to limit the value of new rough grassland habitats for this species. This is likely to lead to a reduction in the local brown hare population.			
13. Harvest mouse	Reduced population of a SPI caused by killing and injury of individuals.	Increased predation pressure from increased	Where new and retained habitat suitable for harvest mouse is present in proximity to residential areas, it is possible there may be an increased predation rate by domestic cats, potentially leading to a localised reduction in the population of harvest mouse in certain areas of the Application Site.	Adverse	Local / Minor	Not significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
		populations of domestic cats.	<p>For example, a study by Woods et al (2003) found that 986 cats brought home 177 harvest mice over a four month period, confirming predation on this species, and a study by Thomas et al (2014) in suburban Reading found that individual domestic cats may range over area of up to 33.8.ha (with a mean maximum range of 6.9 ha). Given average UK cat ownership rates of 17% (PFMA, 2018), equating to 187 cats for a development of 1,100 homes, the evidence suggests that all of the Application Site, and some areas beyond this, could experience increased cat predation as a result of the Proposed Development.</p> <p>Harvest mouse population density has been estimated at 52/ha in suitable habitats (Haberl and Krystufek, 2009), suggesting that the Proposed Development could support on the order of 1000 individuals. Based on the figures above, cat predation rate increases of around 100 harvest mice per year are anticipated (or somewhat less, given the low activity of this species in the winter). However the extent to which this may affect population levels over the long term is hard to predict, though this species is known to have high reproductive rates, short life expectancy and to experience marked fluctuations in population density, suggesting some resilience to increased predation rates.</p>			
14. Hedgehog	Reduced population of a SPI caused by killing and injury of individuals.	Increased numbers of collisions with road vehicles.	Hedgehogs are susceptible to even low speed traffic. The use of the road system in the Proposed Development is likely to lead to an increased number of hedgehog fatalities in the local area.	Adverse	Local / Minor	Not significant
15. Breeding birds	Reduced population of SPI birds caused by killing and injury of individuals.	Increased predation pressure from increased populations of domestic cats.	Where residential areas will be in proximity to retained/created habitat, and in particular to retained or new areas of rough grassland, woodland and scrub, there is likely to be an increased predation rate by domestic cats. Considered in isolation, this effect could possibly reduce the local populations of generalist bird species, which will be nesting/foraging in proximity to developed areas (particularly songbirds, and including SPIs such as dunnock).	Adverse	Local / Minor	Significant

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
	Reduced population of SPI birds caused by killing, injury or displacement of individuals.	Increased recreational pressure on suitable open habitats, especially from dog walkers.	Recreational disturbance is not considered likely to affect tree and scrub nesting bird species. Without careful design of the pedestrian and cycle path network within areas of green space, taking into account the requirement for ground nesting birds (such as skylark) to have access to large, open, relatively undisturbed areas of grassland, recreational disturbance is likely to limit the value of any retained or new grassland habitats at the Application Site for ground-nesting birds species. This is likely to lead to further reductions in populations of sky lark, in addition to those resulting from habitat loss.			
16. Great crested newt	Reduced population of European Protected species through degradation of breeding habitat	Pollution incident within development, carried to ponds via surface water.	The retained and new ponds will be surrounded by buffers of grassland/scrub/attenuation features. These buffers make direct overland pollution (e.g. from spillages) unlikely.	Adverse	Local / Minor	Significant
	Reduced population of European Protected species caused by killing and injury of individuals.	Increased mortality through collisions with road vehicles.	In the vicinity of the Application Site, the local population size of great crested newt is considered likely to be determined by the availability of breeding, foraging and hibernation habitat. Deaths of great crested newts caused by road vehicles on the proposed new road system are considered likely to be rare enough not to have an effect on the size of the local population.			
		Entrapment in the surface water drainage system (especially gully pots).	Entrapment within the surface water drainage system, due to great crested newts entering (and being unable to escape from) gully pots and drains could potentially have an effect on the size of the local population of this species.			

Feature	Potential Effect	Relevant Development Activity	Detail of Ecological Effects from Occupation Phase	Effect	Scale and Severity	Significance
		Flushing of individuals from the section of standing water in the Ellenbrook into the downstream river system (resulting in killing).	Currently, the section of the Ellenbrook within the Site (i.e. between the point it merges from the culvert up to the footbridge at the east of the Site) retains standing water, even when points downstream are dry, and great crested newts have been recorded from this waterbody in small numbers. A high rate of flushing of this area, or changes in the watercourse design could cause this standing water to be lost and/or great crested newts to be flushed downstream during discharges. Due to the relatively low number of this species in this waterbody, and its sub-optimal nature for breeding (due to current water flow), this effect is likely to be limited in extent.			
17. Common toad	Reduced population of a SPI through degradation of breeding habitat.	Pollution incident within development, carried to ponds via surface water.	The retained and new ponds will be surrounded by buffers of grassland/scrub/attenuation features. These buffers make direct overland pollution (e.g. from spillages) unlikely.	Adverse	Local / Minor	Not significant
	Reduced population of a SPI caused by killing and injury of individuals.	Increased numbers of collisions with road vehicles.	Loss of habitat/population connectivity in this species due to development and roads is considered in Table 14.10. In the proposed development, the local population size of common toad is considered likely to be determined by the availability of breeding, foraging and hibernation habitat. Deaths of common toad caused by road vehicles are considered to be rare enough not to have an effect on the size of the local population of this species.			
		Entrapment in the surface water drainage system (especially gully pots).	Entrapment within the surface water drainage system, due to toads newts entering (and being unable to escape from) gully pots and drains could potentially have an effect on the size of the local population of this species.			

14.5.4 Summary of effects (before mitigation)

Table 14.13 provides a summary of the potential ecological effects likely to result from the Proposed Development, considered alone, in the absence of mitigation. Additional mitigation which will address some of the adverse effects is described in the following section. Where there is a difference in the effect type, geographic scale/severity, or significance between construction and occupation phase impacts, the overall (i.e. combined) impact has been determined by the assessor, based on professional judgement.

Table 14.13: Summary of ecological effects (before mitigation). Adverse effects are indicated in yellow (local/minor and not significant) and orange (district/moderate and significant).

Feature	Effects from construction and occupation, considered together			
	Effect type	Geographic scale	Severity	Significance
1. Symondshyde Great Wood LWS and Ancient Woodland	Neutral	N/A	N/A	Not significant
2. Home Covert and Round Wood LWS	Adverse	District	Moderate	Significant
3. Semi-improved neutral grassland	Adverse	District	Moderate	Significant
4. Scrub	Adverse	Local	Minor	Not significant
5. Semi-natural broadleaved woodland	Adverse	District	Moderate	Significant
6. Ellenbrook stream	Adverse	Local	Minor	Not significant
7. Hedgerows	Adverse	Local	Minor	Not Significant
8. Mature trees	Adverse	Local	Minor	Not significant
9. Ponds	Beneficial	Local	Minor	Not significant
10. Badger	Potential breach of wildlife legislation	N/A	N/A	Not significant
11. Bats	Adverse	District	Moderate	Significant
12. Brown hare	Adverse	Local	Minor	Not significant
13. Harvest mouse	Adverse	Local	Minor	Not significant
14. Hedgehog	Adverse	Local	Minor	Not significant
15. Breeding birds	Adverse Potential breach of wildlife legislation	District	Moderate	Significant
16. Great crested newt	Adverse. Potential breach of wildlife legislation	Local	Minor	Not significant
17. Common toad	Adverse	Local	Minor	Not significant

14.5.5 Cumulative Effects

Impacts of the Proposed Development due to cumulative effects with the proposed new quarry on land at Hatfield Aerodrome, adjacent to the south-west of the Site (Hertfordshire County Council planning application number 5/0394-16) and at Furzefield, to the north of Coopers Green Lane, north of the Site (Hertfordshire County Council planning application number 5/3720-16) have been considered. No other planned or Proposed Development is considered to have any cumulative effects with the Proposed Development.

The illustrative restoration concept for the quarrying works to the south-west of the Application Site indicate that the quarried area (which will be in-filled with inert materials) area will be restored to

open unimproved grassland with field drains, small ponds and wetland areas, areas of acid grassland, an area specified for nature conservation, and larger waterbodies with fringing reedbed habitat. The proposed quarrying works are expected to last 30 years and therefore restoration is assumed to be in place by around 2048.

The restoration plan for the quarrying works to the north the Application Site indicates that the area will be restored to lake, wetland and scrapes and acid grassland with small areas of woodland planting. In-filling will be limited to stockpiled materials dug during the quarrying operation itself. Quarrying works here are anticipated to last 18 months, and therefore it is assumed that restoration will begin at or soon after the start of construction at the Application Site.

Cumulative effects, considered separately for the period up to 2048 and post-2048 are considered in Table 14.14. For the period up to 2048, it is assumed that restoration of the Furze field quarry site is complete and that the quarry on land south-west of the Application Site is operational. For the period post-2048, it is assumed that restoration of both of these quarries is complete. Although some adverse and beneficial cumulative effects have been identified, these are not considered to alter the geographic scales/severities indicated in Table 14.13 above.

Tale 14.14. Potential cumulative effects

Feature	Potential Cumulative effects	
	Up to 2048	Post-2048
1. Symondshyde Great Wood LWS and Ancient Woodland	None.	None.
2. Home Covert and Round Wood LWS	The removal of publically accessible land during quarrying to the south-west of the Application Site could increase recreational pressure on this LWS. However, this area appears to currently be little used by the public, perhaps due to the rough nature of the vegetation and paths there and its relatively remote location. Due to the likely limited magnitude and temporary nature of this cumulative effect, it is not considered to raise the geographic scale / severity of this cumulative effect from the district / moderate level already identified for the Proposed Development considered in isolation.	The provision of extensive new accessible land and footpaths as part of the quarry restoration would remove the cumulative effect of displaced recreational pressure noted up to 2050.
3. Semi-improved neutral grassland	New open grassland habitat would be created to the north of the Proposed Development at Furze field before or very early in the Proposed Development, compensating to some extent for the loss of grassland in the early stages of the Proposed Development. Losses of grassland due to quarrying to the south-east of the Site would result in a temporary loss of grassland overall at the district level. The extent and temporary nature of this cumulative loss is not	Restoration at the quarry site to the south-west of the Application Site would restore the extent of grassland there, though there would likely be a further time lag before species-richness and structure were attained. Recreational pressure on the restored area is likely to increase due to the Proposed Development. However, the cumulative effect is not considered to raise the geographic scale / severity of this cumulative effect from the district / moderate level already identified for the

	considered to raise the geographic scale / severity of this cumulative effect from the district / moderate level already identified for the Proposed Development considered in isolation.	Proposed Development considered in isolation.
4. Scrub	Scattered scrub is present on both the Application Site itself and the quarry site to the south-west of the Application Site. Creation of new heath scrub is proposed at the Furze field site. There will be a cumulative reduction in the extent of this habitat. However, because this habitat is relatively common and widespread, both locally and nationally, and because extensive areas of scrub will be maintained within the Proposed Development, this cumulative effect will not increase the scale / severity of the effect from the local / minor level already identified for the Proposed Development considered in isolation.	Scattered scrub forms part of the proposed restoration of the quarry site to the south-west of the Application Site, therefore the cumulative loss of scrub habitat would be reduced post 2050.
5. Semi-natural broadleaved woodland	None	None
6. Ellenbrook stream	There is potential for a reduction in the water table (resulting from quarrying works to the south-west of the Application Site) to exacerbate the increased flow variability in the Ellenbrook stream (that will likely to result from discharges of treated surface water from the Proposed Development). Given the local value of this feature, and the existing flow variability, this cumulative impact is not considered to raise the geographic scale / severity of the effect from the district / moderate level already identified for the Proposed Development considered in isolation.	Restoration of the water table following quarry restoration would remove the impacts noted up to 2050 over the longer term (i.e. post 2050). This would result in a neutral cumulative effect over the long term.
7. Hedgerows	A hedgerow across the centre of the quarry site to the south-west of the Application Site will be removed during quarrying works. However, this is not considered to raise the geographic scale / severity of this cumulative effect from the local / minor level already identified for the Proposed Development considered in isolation.	The hedgerow mentioned to the left would be reinstated post 2050. This would result in a neutral cumulative effect over the long term.
8. Mature trees	None	None

<p>9. Ponds</p>	<p>A new lake and several ponds will be created in proximity to the Application Site following restoration at the Furzefield quarry site. There will be a loss of individual ponds from the quarry site at the south-west of the Application Site during quarrying, though there will be a net gain in the number of ponds at all times at that site due to the need for habitat creation for great crested newts. No cumulative impact on ponds is therefore considered likely.</p>	<p>A series of new compensatory ponds and two large lakes are proposed as part of the restoration of the area to the south-west of the Application Site, representing a significant increase in the number of ponds in the local area. These will contribute to the local / minor beneficial effect on ponds already identified for the Proposed Development considered in isolation.</p>
<p>10. Badger</p>	<p>None</p>	<p>None</p>
<p>11. Bats</p>	<p>A possible temporary reduction in local habitat connectivity may result from the quarrying works to the south-west of the Application Site. Also temporary cumulative reduction in local foraging habitat. Given the local value of this feature and the temporary nature of the effect, this cumulative effect is not considered to raise the geographic scale / severity of the effect from the district / moderate level already identified for the Proposed Development considered in isolation. New open grassland habitat and wetland (a favoured bat foraging habitat) would be created to the north of the Proposed Development at Furzefield before or very early in the Proposed Development, compensating to some extent for the loss of grassland in the early stages of the Proposed Development.</p>	<p>Restoration of the quarry to the south-west of the site to open grassland, scrub lakes, ponds and woodland would, over the longer term (i.e. post 2050), result in a more diverse landscape locally for foraging bats. This would remove the cumulative effects noted up to 2050.</p>
<p>12. Brown hare</p>	<p>The creation of new open grassland in the quarry restoration to the north of the Application Site would provide some new habitat suitable for this species. This would occur before or soon after the start of the Proposed Development. The loss of grassland at the quarry site to the south-west of the Application Site would result in a reduction in the extent of suitable habitat at a local level, and hence a likely reduction in the distribution of this species at the local level. Given the local value of this feature this cumulative impact is not considered to raise the geographic scale / severity of the effect from the local / minor level already identified for the</p>	<p>Restoration of the quarry to the south-west of the Application Site to open habitats could provide suitable habitat for brown hare on an area continuous with the retained grassland at the Site. However, increases in recreational pressure on the restored part of the quarry (which will have public access) resulting from the Proposed Development is likely to reduce its suitability, even if recolonisation were possible. Therefore a reduction in the local distribution of this species over the local area is likely to be permanent. Given the local value of this feature, this cumulative impact is not considered to raise the geographic scale / severity of the effect from the local / minor level</p>

	Proposed Development considered in isolation.	already identified for the Proposed Development considered in isolation.
13. Harvest mouse	None	None
14. Hedgehog	None	None
15. Breeding birds	Quarrying works to the south-west of the Application Site will contribute to a combined reduction in the area of habitat suitable for ground-nesting birds in the local area. Restoration of the quarry site to the north of the Application Site will partially compensate for this. Given the local value of this feature, this cumulative impact is not considered to raise the geographic scale / severity of the effect from the district / moderate level already identified for the Proposed Development considered in isolation.	Restoration of the quarry to the south-west of the Application Site to open habitats could provide suitable habitat for ground nesting birds on an area continuous with the retained grassland at the Site. However, increases in recreational pressure on the restored part of the quarry (which will have public access) resulting from the Proposed Development is likely to reduce the suitability of this habitat, even if recolonisation were possible. Therefore a reduction in the local distribution of ground nesting bird species over the local area is likely to be permanent. Given the local value of this feature, this cumulative impact is not considered to raise the geographic scale / severity of the effect from the district / moderate level already identified for the Proposed Development considered in isolation.
16. Great crested newt	Restoration works to the north of the Application Site will increase the local habitat for this species. The works to the south-west of the Application site will involve a rolling programme of licensed mitigation, with an increased availability of habitat at all times during the quarrying phase. There may be some reduction in habitat connectivity to the Application Site during the phase of works closest to the Application Site. Given that these adverse effects will be temporary, the local value of this feature, and the fact that the Application Site supports a moderately sized metapopulation with connectivity to other breeding ponds, this cumulative impact is not considered to raise the geographic scale / severity of the effect from the district / moderate level already identified for the Proposed Development considered in isolation.	Post restoration there will be a beneficial cumulative effect on great crested newts due to the increase in the number of wildlife-focused ponds in the local area, and their on-going management. However, without additional mitigation in the Proposed Development, the cumulative effect is still considered to be adverse at the district / moderate level, due primarily to the potential for killing of great crested newts during construction works and entrapment in the site drainage system during the occupation phase.
17. Common toad	As 16. <i>Great crested newt</i> above.	As 16. <i>Great crested newt</i> above.

14.6 MITIGATION

Mitigation measures that will address some of the ecological effects identified above are outlined in Table 14.14. These measures are additional to the ecology mitigation that has been designed into the Proposed Development, as outlined under *Ecology Strategy* above.

It is recommended that the proposed mitigation, including both the Ecology Strategy and additional mitigation is detailed within and delivered via the following documents, to be submitted to the LPA for approval prior to the start of construction:

- Construction Ecological Management Plan (CEMP). Describing ecology mitigation works (excluding habitat creation) that will precede and accompany the construction phase of the Proposed Development.
- Landscape Environmental Management Plan (LEMP). Describing habitat creation works that will precede or accompany or the construction phase of the Proposed Development, and habitat management and monitoring works that will follow the completion of the construction phase.

It is recommended that the proposed mitigation is secured through an appropriately worded planning condition requiring the mitigation described in this chapter to be incorporated into CEMP and LEMP documents, and these documents to be submitted to the planning authority for approval prior to the start of construction.

Table 14.14: Mitigation recommendations.

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
1. Symondhyde Great Wood LWS and Ancient Woodland	None	None
2. Home Covert and Round Wood LWS	Fencing protection to avoid accidental incursion within 15 m of the LWS by construction vehicles during construction (except for any necessary landscaping/vegetation management within the western green corridor).	Access management (including barbed wire fencing along eastern boundary of the woodland and the provision of a planted woodland walk along the eastern edge of the woodland, east of the fence, to include a 15 m strip of woodland planting (widely spaced oak and hornbeam trees) with native ground flora planting (e.g. native ferns and bluebell of local provenance), replacing the existing vehicle track. This will provide a woodland walk adjacent to the edge of the LWS, thus reducing the attraction of entering the mature woodland, but will maintain visual accessibility into the woodland. Managed access to the easternmost part of the Lake within the eastern edge of the woodland, could also be included, with appropriate fencing preventing access beyond the eastern edge. Ongoing-maintenance of the fencing and woodland walk as part of the permanent management regime for greenspaces within the development.
3. Semi-improved neutral grassland	Fencing protection of grassland that is to be retained to avoid accidental incursion by construction vehicles during construction (except for any necessary landscaping/vegetation management, such as around ponds). This includes fencing protection of the green corridors at the east and west of the Application Site.	<u>For the majority of the retained grassland:</u> Conservation-focused grassland management programme, to include grazing during the growing season (and necessary fencing and infrastructure) and ecological monitoring of grassland structure and species composition, with monitoring feeding back into the management regime for the first ten years post-construction. Ongoing-maintenance of this conservation-focused grassland management as part of the permanent management regime for greenspaces within the development.

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
		<p><u>For further areas of retained grassland (e.g. within the green corridors at the east and west of the Application Site, and along the de-culverted Ellenbrook:</u></p> <p>Conservation-led management by mowing of 50 % of the grassland every year (i.e. individual areas will be mown once every two years) to allow the retention of some winter vegetation structure for invertebrate and mammal species, with monitoring feeding back into the management regime for the first ten years post construction. Arisings from mowing to be collected into wildlife-focused compost heaps and habitat piles (with scrub management trimmings) within the green corridors.</p> <p>Ongoing-maintenance of this conservation-focused grassland management as part of the permanent management regime for greenspaces within the development</p>
4. Scrub	Fencing protection of areas of scrub that are to be retained to avoid accidental incursion into by construction vehicles during construction. This includes fencing protection of the green corridors at the east and west of the Application Site.	<p>Conservation-focused scrub management programme, to include maintaining a total scrub/tree cover of 20 to 40 % of the green corridors. Ecological monitoring of grassland structure and species composition, with monitoring feeding back into the management regime for the first ten years post-construction.</p> <p>Scrub trimmings to be collected into wildlife friendly compost heaps / habitat piles within the green corridors.</p> <p>Ongoing-maintenance of the conservation-focused grassland management as part of the permanent management regime for greenspaces within the development.</p>
5. Semi-natural broadleaved woodland	Fencing protection to avoid accidental incursion within the mature woodland within the west of the Application Site by construction vehicles during construction (except for any necessary landscaping/vegetation management within the western green corridor).	<p>Access management (including barbed wire fencing along eastern boundary of the woodland and the provision of a planted woodland walk along the eastern edge of the woodland, east of the fence, to include a strip of woodland planting (widely spaced oak and hornbeam trees) with native ground flora planting (e.g. native ferns and bluebell of local provenance), replacing the existing vehicle track. This will provide a woodland walk adjacent to the edge of the mature</p>

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
		woodland, thus reducing the attraction of entering the mature woodland, but will maintain visual accessibility into the woodland. Ongoing-maintenance of the fencing and woodland walk as part of the permanent management regime for greenspaces within the development.
6. Ellenbrook stream	<p>Fencing protection to avoid accidental incursion within the retained green corridors along the Ellenbrook by construction vehicles during construction (exception for any necessary landscaping/vegetation management within these green corridors).</p> <p>All works at the Application Site to be in accordance with appropriate pollution prevention guidance, such as Pollution prevention for business (Defra and EA, 2016). Industry standard pollution control measures to be incorporated in to any surface water drainage feeding into the Ellenbrook, such as provision for silt settlement and control of hydrocarbons/oil.</p> <p>Wherever possible (taking into account considerations such as land contamination), surface water at the site should be infiltrated into the ground rather than discharged into the Ellenbrook. Discharges should be of treated water (e.g. via settlement), and discharges should be restricted to appropriate flow rates through the use of storage ponds and flow regulators or similar.</p>	Ongoing wildlife-focused maintenance of the green corridors along the Ellenbrook as part of the permanent management regime for greenspaces within the development.
7. Hedgerows	Fencing protection of hedgerows sections to be retained to avoid accidental incursion by construction vehicles during construction.	Planting of 2 m of native species-rich hedgerow for every 1 m of hedgerow to be lost in the development. This will be in a suitable location, such as on the boundary between the retained grassland in the south and west and developed areas of the Application Site.

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
		<p>Conservation-focused management of retained and new hedgerows, to include late winter trimming every two years (to allow the development of flowering and fruiting wood) and retention (and thinning) of hedgerow trees.</p> <p>Ongoing-maintenance of the fencing and woodland walk as part of the permanent management regime for greenspaces within the development.</p>
8. Mature trees	<p>Fencing protection to avoid accidental incursion within root protection zones of mature trees (as advised by a qualified arboriculturist) by construction vehicles during construction. In all or most cases these zones will be well within the green corridors.</p>	None
9. Ponds	<p>Fencing protection to avoid accidental incursion of ponds or adjacent vegetation by construction vehicles during construction. In all or most cases these areas will be well within the retained grassland and are likely to be sufficiently protected by the protective fencing around the retained grassland.</p>	<p>Access management (i.e. installation of fencing) to protect bankside vegetation along at least 60% of pond margins from access by people or livestock.</p> <p>Ongoing-maintenance of this fencing as part of the permanent management regime for greenspaces within the development</p>
10. Badger	<p>Protective fencing during construction (to prevent accidental incursion within 20 m of badger setts).</p> <p>Any digging or construction works within 20 m of active badger setts to proceed under a Natural England badger licence, with appropriate mitigation. For works in close proximity to a sett, this may involve sett closure, and (where a main sett is to be closed) the construction of a compensatory artificial badger sett.</p> <p>Application for a Natural England badger license is likely to require an up-to-date badger survey of the relevant works area and adjacent areas.</p>	None

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
	<p>Update badger surveys are to be carried out by a suitably qualified ecologist not more than one month prior to the start of construction (including for separate phases of construction where a phased approach is to be employed).</p> <p>Measures to be put in place during construction to avoid killing or injury of badgers through entrapment in pits, trenches or pipes at the construction site.</p>	
11. Bats	<p>Measures to avoid effects of floodlighting during construction on foraging, roosting and commuting habitats for bats, e.g. through time of year, location and direction, and shielding.</p>	<p>Lighting scheme to minimise light spill on all retained or new habitats (especially the green corridors in the east and west and long the Ellenbrook, retained grassland in the south, woodland west of the Application Site and the hedgerows along Coopers Green Lane to the north. To be achieved through the use of directed lighting fixtures and shields, through minimising the power of all lighting fixtures, and through avoiding external lighting wherever possible.</p> <p>Street lighting to be avoided where roads cross green space.</p> <p>Low level bollard lighting to be employed in preference to high level lighting wherever possible.</p> <p>The lighting scheme for the site will include a lux level contour plan, and will be subject to review and input from a professional ecologist and will be submitted to the Welwyn Hatfield District Council for approval prior to the start of construction (or the start of construction of the relevant phase).</p>
12. Brown hare	None	None
13. Harvest mouse	<p>Management of new and retained grassland to be designed with consideration of the habitat requirements of harvest mouse.</p>	None
14. Hedgehog	<p>Construction of ten habitat piles from scrub and tree cuttings/brash during initial vegetation management on/near the green corridors.</p>	<p>Creation of /addition to habitat piles during scrub and grassland management within green corridors, to form part of the permanent management regime for greenspaces within the development.</p>

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
15. Breeding birds	<p>Wherever possible, vegetation clearance for construction will be carried out outside the bird breeding season (which is March to August inclusive). Where this is not possible, vegetation clearance will be preceded by a check for nesting birds by a professional ecologist. If nesting birds are found to be present, the nest will be retained (with a suitable buffer) until the nest is no longer in use (as confirmed by a professional ecologist).</p> <p>Where open or cleared areas remain undeveloped, and there is a risk of ground-nesting birds breeding, these areas will also be subject to the checks and measures described above immediately prior to renewal of construction/preparation works.</p> <p>A minimum of three barn owl nest boxes will be installed in suitable locations in woodland at Round Wood and Home Covert LWS (beyond the west of the Application Site) or within mature woodland within the west of the Application Site. These will be maintained/replaced as necessary as part of the permanent management regime for greenspaces within the development.</p>	<p>Management scrub, trees and hedgerows at the Application Site will be designed to avoid impacts on breeding birds, primarily through ensuring that these activities are carried out outside the breeding season.</p>
16. Great crested newt	<p>Clearance of habitats suitable for this species within 250 m of known or assumed populations to take place under European Protected Species mitigation licence from Natural England, which will involve destructive searches for this species over small areas of suitable habitat and trapping over larger areas of suitable habitat.</p> <p>Habitat retention outlined in the Ecology Strategy will avoid effects on newts in or adjacent to (i.e. within at least 50 m of) ponds.</p> <p>Protective fencing of ponds during construction (to prevent accidental incursion), as described <i>Ponds</i> above.</p>	<p>None</p>

Feature	Mitigation Recommendations	
	Construction phase (delivered through a CEMP)	Occupation phase (delivered through a LEMP)
	<p>New ponds at the Site will be deigned with consideration of the habitat requirements of great crested newt, including provision of terrestrial and hibernation habitat.</p> <p>Construction of five permanent hibernation sites within the Application Site, in suitable proximity to existing and new ponds.</p> <p>The surface water drainage system will be designed to be amphibian friendly through input from a professional ecologist. It will be designed to minimise the likelihood of amphibians becoming trapped, such as through the installation of British Herpetological Society Amphibian Gully Pot Ladders (or equivalent) into all gully pots in the development, or through the use of alternative drainage systems which avoid the potential for entrapment.</p> <p>Kerbs on all road crossings or adjacent to greenspace will be bullnose or half battered kerbs (rather than straight kerbs) in order to reduce the likelihood of amphibians being trapped on roads.</p> <p>Install/maintain weir system to maintain a level of water within the section of the Ellenbrook from where it emerges from the culvert to the pedestrian footbridge.</p>	
17. Common toad	<p>Measures under 16. <i>Great crested newt</i>, above, will provide mitigation against killing an injury of common toad during site clearance.</p> <p>New ponds at the Site will be deigned with consideration of the habitat requirements of common toad, including provision of terrestrial and hibernation habitat.</p>	None

14.7 RESIDUAL EFFECTS

Table 14.15 lists the residual effects following the implementation of the further mitigation measures outlined in Table 14.14 above and identifies whether these are significant.

One significant residual effect remains, which is the loss of the majority of semi-improved grassland at the Application Site, which meets the criteria for a Hertfordshire Local Wildlife Site. It is not possible to mitigate this effect within the Proposed Development.

Five further adverse residual effects have been identified, all of which are local / minor effects and are not considered significant.

There are also four beneficial residual effects, all of which are local / minor and not significant.

Table 14.15: Residual effects. Neutral or negligible effects are indicated in white. Adverse effects are indicated in yellow (for local/minor effects that are not significant) or orange (for district/moderate effects that are significant). Beneficial effects are indicated in green.

Feature	Effects from construction and occupation phases				
	Residual Effects	Effect type	Geographic scale	Severity	Significance
1. Symondshyde Great Wood LWS and Ancient Woodland	None. There is no conflict with policy or legislation.	Neutral	N/A	N/A	Not significant
2. Home Covert and Round Wood LWS	After the mitigation measures described above, very limited additional recreational pressure is anticipated at the LWS. The residual adverse effect is therefore considered to be negligible, and hence there is no conflict with local policy <i>R15 Wildlife sites</i> , or other policy or legislation.	Adverse	Site	Negligible	Not significant
3. Semi-improved neutral grassland	Loss of two thirds of semi-improved neutral grassland is unavoidable in the Proposed Development, though a sufficient area will be retained to allow good conservation management, and habitat connectivity will be retained. Overall, there is a residual loss which, on reference to the NPPF and Welwyn Hatfield Local Plan Policy R11, results in a significant effect.	Adverse	District	Moderate	Significant
4. Scrub	The above mitigation, which will retain some scrub at the Site and will maximise its biodiversity value. This effect does not conflict with policy or legislation.	Adverse	Site	Negligible	Not significant
5. Semi-natural broadleaved woodland	With fencing protection, no effects during construction and negligible effects from recreational pressure during occupation are anticipated. There is no conflict with policy or legislation.	Neutral	N/A	N/A	Not significant
6. Ellenbrook stream	Potential damage during construction and hydrological and pollution effects of new surface water discharges. The adverse effects are partially compensated for by an increase in the amount of new stream habitat created via de-culverting, and mitigated for by additional protection measures during construction and by pollution control through treatment. A potential local effect remains due to flow variation and water quality impacts from surface water discharges. There is no conflict with policy or legislation.	Adverse	Local	Minor	Not significant

7. Hedgerows	With the above mitigation, overall effects on hedgerows will be neutral. There is no conflict with policy or legislation.	Neutral	N/A	N/A	Not significant
8. Mature trees	With the above mitigation, no effects on mature trees are anticipated. There is no conflict with policy or legislation.	Neutral	N/A	N/A	Not significant
9. Ponds	With the above mitigation, the overall effect on ponds is considered likely to be beneficial, due to the creation of four new ponds of good quality in place of the two poor-quality ponds that will be lost. There will also be beneficial management to increase the quality of retained ponds. This effect is in line with the NPPF and Welwyn Hatfield Local Plan Policy <i>R11 - Biodiversity and Development</i> .	Beneficial	Local	Minor	Not significant
10. Badger	With the above mitigation, there is no conflict with policy or legislation.	Neutral	N/A	N/A	Not significant
11. Bats	With the above mitigation, in particular the retention of dark habitat corridors at the east and west of the Application Site, and across the centre of the Application Site, the retention of dark grassland habitat at the South, an increase in the area of wetland habitats, and in increase in the number of roosting sites, a local benefit to bats is anticipated, and there is no conflict with policy or legislation, including Local Welwyn Hatfield Local Plan Policy <i>R20 - Light Pollution</i> .	Beneficial	Local	Minor	Not significant
12. Brown hare	Adverse effects on the small population of brown hare likely to be present at the Site is unavoidable. Given this species is relatively widespread in Hertfordshire, this will result in an adverse effect at the Local level. There is no conflict with policy or legislation. There is a duty on local authorities to have due regard to SPI species in carrying out their functions, and this assessment provides the information required for this.	Adverse	Local	Minor	Not significant
13. Harvest mouse	Given the loss of some suitable habitat for this species (primarily at the west of the Application Site), an adverse effect at the local level is unavoidable. There is no conflict with policy or legislation. There is a duty on local authorities to have due regard to SPI species in carrying out their functions, and this assessment provides the information required for this.	Adverse	Local	Minor	Not significant
14. Hedgehog	The area of suitable foraging habitat for this species is likely to decrease in the Proposed Development, and there is likely to be an increase in mortality from new roads and increased traffic flows locally. The	Adverse	Local	Minor	Not significant

	<p>hedgehog in the vicinity of the Application site is likely to be limited by the availability of cover and/or hibernation sites, rather than foraging habitat (because the areas is dominated by open grassland). Therefore, the mitigation included above (provision and maintenance of habitat piles) is likely to offset these adverse effects to some extent. However, overall, a minor adverse effect on this species is considered unavoidable. There is no conflict with policy or legislation. There is a duty on local authorities to have due regard to SPI species in carrying out their functions, and this assessment provides the information required for this.</p>				
15. Breeding birds	<p>With the above mitigation, no potential breach of wildlife legislation is anticipated. The residual effect will be the loss of two pairs of breeding lapwing (i.e. a complete loss of this species from the Application Site), and a reduction in the number of skylark at the Application Site. Both of these species are red-listed due to national declines in their populations and are SPIs, however they remain numerically abundant nationally and are both described as common in Hertfordshire in Birds of Hertfordshire (Smith et al. 2015). The overall effect on birds is therefore considered to be an adverse effect at the local level. There is no conflict with policy or legislation. There is a duty on local authorities to have due regard to SPI species in carrying out their functions, and this assessment provides the information required for this.</p>	Adverse	Local	Minor	Not significant
16. Great crested newt	<p>With the above mitigation, and considering the increase in breeding and hibernation habitat that will result from the Proposed Development, an overall beneficial effect at the local level is anticipated. This effect is in line with the NPPF and the Hertfordshire Biodiversity Action Plan.</p>	Beneficial	Local	Minor	Not significant
17. Common toad	<p>With the above mitigation, and considering the increase in breeding and hibernation habitat that will result from the Proposed Development, an overall positive effect at the local level is anticipated. There is no conflict with policy or legislation.</p>	Beneficial	Local	Minor	Not significant

14.8 SUMMARY OF EFFECTS

Based on the nature and location of the Proposed Development, including designed-in mitigation described in the Ecology Strategy, no significant adverse effects on statutory designated sites are anticipated.

Without additional mitigation, and including cumulative effects with other planned or proposed developments, there will be significant adverse effects (at the district / moderate level) on the following features: (1) Home Covert and Round Wood LWS (due to the potential for accidental damage during construction and recreational pressure during occupation); (2) Semi-improved neutral grassland (because the majority of this habitat, which meets the Hertfordshire criteria for Local Wildlife Sites, will be lost from the Application Site); (3) Semi-natural broadleaved woodland within the west of the Application Site (because there is potential for accidental damage during construction and recreational pressure during occupation); (4) Bats (due primarily to the potential for light spillage from new street and external lighting to reduce the value of commuting and foraging habitat at and near the Application Site); and (5) Breeding birds (due to potential impacts during construction and the extent of the loss of open grassland habitat at the site, currently supporting breeding lapwing and skylark).

There will be ten non-significant effects (at the local /minor level), on scrub habitat, the Ellenbrook stream, hedgerows, mature trees, ponds, brown hare, harvest mouse, hedgehog, great crested newt and common toad.

Given the identified effects, additional mitigation and enhancement measures have been proposed in this assessment. These reduce the impact of the Proposed Development, such that one significant residual adverse effect remains: an adverse effect on semi-improved neutral grassland at the district/moderate level. There will also be non-significant residual adverse effects (at the local / minor level) on the Ellenbrook stream, brown hare, harvest mouse, hedgehog and breeding birds.

There will be non-significant residual minor beneficial effects on ponds, bats, great crested newt and common toad. All other effects are considered to be neutral or negligible.

14.9 CONCLUSIONS

The Proposed Development will incorporate extensive ecological mitigation, and will retain much of the ecological value of the site, including for protected species such as great crested newts and bats, and habitats such as open grassland, woodland, the Ellenbrook stream and ponds.

The Proposed Development will have a moderate residual adverse effect on semi-improved neutral grassland at the Site, because approximately one third of this habitat will be retained and two thirds will be lost. In relation to the provisions set out within the NPPF and Welwyn Hatfield Local Plan Policy R11, the Proposed Development has sought to minimise impacts on habitats, although the residual effect on semi-improved neutral grassland is considered to be significant.

The Proposed Development will also have minor residual adverse effects (on the Ellenbrook stream, brown hare, harvest mouse, hedgehog and breeding birds) that are not considered to conflict within any legislation or policy and are not considered to be significant. There is, however, a duty on local authorities to have due regard to SPI species (e.g. brown hare, harvest mouse and hedgehog) in carrying

out their functions, and this assessment provides the information required for them to discharge this duty.

14.10 REFERENCES

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