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5.1 INTRODUCTION

5.1.1 This chapter of the ES, prepared by the Environmental Dimension Partnership Ltd (EDP), assesses the likely significant effects of the Proposed Development on Important Ecological Features (designated sites, habitats and/or species populations) at Gavray Drive, Bicester, hereafter referred to as the 'Site'. This chapter has been prepared by Tom Wigglesworth (BSc Hons, MSc, MCIEEM), a Director of EDP with over 20 years' experience.

5.1.2 The assessment includes a summary of the current ecological conditions found within and around the Application Site and identifies measures to avoid, minimise and/or compensate, where appropriate, for significant effects that may arise as part of the Proposed Development. It has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management Guidelines for Ecological Impact Assessment in the UK and Ireland published by CIEEM in September 2018 (Version 1.1)[1].

5.1.3 This chapter should be read in conjunction with the following Technical Appendices:

- **Appendix 5.1** - Ecological Baseline Report (setting out full details of the baseline surveys and other work undertaken to identify and evaluate relevant Important Ecological Features);

- **Appendix 5.2** – Biodiversity Impact Assessment (setting out detailed calculations of biodiversity/habitat loss and gain using a standard Biodiversity Metric); and

- **Appendix 5.3** - Ecological Management Plan (setting out a detailed plan for the restoration and management of valuable habitats and species populations located within the portion of the Application Site which forms part of the Ray Conservation Target Area and Gavray Drive Meadows Local Wildlife Site).

[1] Chartered Institute of Ecology and Environmental Management (September 2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2nd Edition)

5.2 RELEVANT POLICY

National Planning Policy Framework

5.2.1 The Government published a revised version of the National Planning Policy Framework (NPPF) in February 2019. Paragraph 170 of the NPPF states that:

'*planning policies and decisions should contribute to and enhance the natural and local environment by:*

a) Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

b) Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.'

5.2.2 Paragraph 170 of the revised NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by:

d) Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.'

5.2.3 With regard to planning applications and biodiversity, Paragraph 175 of the NPPF states that:

'When determining planning applications, local planning authorities should apply the following principles:

a) If significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;

b) Development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the Application Site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interests;

c) Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) Development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encourages especially where this can secure measurable net gains for biodiversity.'

5.2.4 In Paragraph 180, the revised NPPF advises that '*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the Application Site or the wider area to impacts that could arise from the development. In doing so they should:*

…

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'

Planning Practice Guidance

5.2.5 Further guidance on the NPPF with respect to ecology is described within the Planning Practice Guidance on the Natural Environment under 'Biodiversity, geodiversity and ecosystems'[2].

Adopted Local Plan

5.2.6 The Proposed Development is part of the development allocated by Policy Bicester 13 within The Cherwell Local Plan 2011 – 2031 and is subject to the provisions of that Policy. With regard to ecology, Policy Bicester 13 includes the following design and place shaping principles:

- *'Development must avoid adversely impacting on the Conservation Target Area and comply with the requirements of Policy ESD11 to secure a net biodiversity gain.*
- *Protection of the Local Wildlife Site and consideration of its relationship and interface with residential and other built development.*
- *Detailed consideration of ecological impacts, wildlife mitigation and the creation, restoration and enhancement of wildlife corridors to protect and enhance biodiversity. The preparation and implementation of an Ecological Management Plan*

[2] www.gov.uk/guidance/natural-environment

to ensure the long-term conservation of habitats and species within the Application Site.

- *The preparation of a structural landscaping scheme, which incorporates and enhances existing natural features and vegetation. The structural landscaping scheme should inform the design principles for the Application Site. Development should retain and enhance significant landscape features (e.g. hedgerows) which are or have the potential to be of ecological value. A central area of open space either side of Langford Brook, incorporating part of the Local Wildlife Site and with access appropriately managed to protect ecological value. No formal recreation within the Local Wildlife Site.'*

5.2.7 In addition, other relevant development management policies include Policy ESD10 which aims to protect and enhance biodiversity and the natural environment; Policy ESD11 which relates to Conservation Target Areas (CTAs); and Policy ESD17 relating to the maintenance and enhancement of the District's Green Infrastructure.

Any other relevant policy, legislation or guidance

Natural England Standing Advice

5.2.8 Protected species are a material consideration in the determination of planning applications and Natural England, as the statutory nature conservation organisation for England, provides specific 'Standing Advice' regarding various protected species. This advice contains details on potentially significant effects and recommended survey effort to support planning applications.

The Conservation of Habitats and Species Regulations 2017 (as amended)

5.2.9 The Conservation of Habitats and Species Regulations 2017 (as amended) provide for the designation and protection of statutorily designated wildlife sites of European importance ('European sites'), and the protection of a number of rare and vulnerable species in a European context ('European Protected Species' (EPS)). European sites, including Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites are recommended for designation in the UK by the Joint Nature Conservation Committee (JNCC).

The Wildlife and Countryside Act 1981

5.2.10 The Wildlife and Countryside Act 1981 (as amended) enshrines the protection of statutory designated wildlife sites of national importance (Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs)) in England and Wales. The Act also sets out varying

degrees of protection and offences with regards to native species and their habitats that are rare and vulnerable in a national context. The Act also provides for the control, management and offences in respect of invasive non-native species. Sites of national importance (SSSIs and NNRs) are designated by Natural England under the Act and are protected from any development that may destroy or negatively affect them, either directly or indirectly.

Protection of Badgers Act 1992

5.2.11 The Protection of Badgers Act 1992 (as amended) affords protection specifically to badgers (*Meles meles*) and their setts.

Natural Environment and Rural Communities (NERC) Act 2006

5.2.12 Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a statutory duty on Local Planning Authorities (LPAs) to consider the effects upon biodiversity when exercising their functions in England and Wales. In addition, Section 41 of the Act makes for the provision of a list of habitats and species of principal importance for the conservation of biodiversity.

Biodiversity 2020

5.2.13 In 2013, the UKBAP Priority Habitats and Priority Species, and the Section 41 Species and Habitats of Principal Importance for Conservation under the NERC Act 2006, were rationalised. This rationalisation occurred under the 'Post-2010 Biodiversity Framework'. As a result, a new list of Priority Species and Priority Habitats is now in operation at the UK level. These new lists supersede the former UKBAP; they are the new 'Biodiversity Indicators' that are used to monitor the status of biodiversity at the UK level. Each of the four devolved countries of the UK also has a similar list. Within England, the new rationalised lists of 24 Priority Habitats and 213 Priority Species are provided in Biodiversity 2020 which is the national biodiversity policy for England.

Water Framework Directive

5.2.14 The Water Framework Directive (WFD) sets a number of different environmental objectives for surface water including prevention of deterioration in the status of waterbodies, aim to achieve good ecological and good surface water chemical status in those water bodies currently at poor status, comply with objectives and standards for protected areas and prevent or limit the input of pollutants into groundwater. Additionally, the Langford Brook waterbody, which runs through the Application Site, is covered under the Protected Area Designation for Freshwater Fish Directive, Nitrates Directive and Urban Waste Water Treatment Directive. The current overall status as of December 2009 of the Langford Brook

waterbody, which runs through the Study Area, was Moderate with the objective to achieve Good status by 2015.

5.3 ASSESSMENT METHODOLOGY

Scope

5.3.1 The scope of this assessment was determined by previous ecological investigations of the Application Site, CDC Scoping Opinion (11 November 2020) and ES Scoping responses and other pre-application consultation comments received from a range of ecological stakeholders as outlined in full within **Appendix 5.1**.

5.3.2 The extent of the Application Site reflects the area allocated for development in the adopted Cherwell Local Plan and which is subject to an outline planning application. The Study Area used for the purposes of identifying potential important ecological features assessing effects extended beyond the Application Site to a wider potential zone of influence in accordance with the CIEEM Guidelines. The zone of influence has been determined through a review of the baseline ecological conditions and relative areas and resources that may be affected by the Proposed Development.

A3.1 The following potential zones influence beyond the Application Site boundary were used during the Desk Study:

- 10km radius for sites of European importance;
- 5km radius for sites of national importance;
- 6km radius for Annex II bat species;
- 2km radius for sites of local importance;
- 2km radius for other protected/notable species records; and
- 500m radius for Priority Habitats.

5.3.3 Baseline data has been collected from the Application Site since 2002 and has been presented in two previous Environmental Impact Assessments (EIAs); in 2004 and 2013. EDP has gathered updated information from the Application Site during 2019 to 2021. These updated investigations comprised a desk study, Extended Phase 1 Habitat Survey and a suite of additional Phase 2 surveys including detailed botanical surveys of the hedgerows and grasslands and surveys for wintering and breeding birds, roosting and foraging bats, otter, water vole, dormouse, harvest mouse, badger, great crested newt (GCN), reptiles, terrestrial and aquatic invertebrates.

5.3.4 Full details of the most recent baseline surveys are provided in **Appendix 5.1**.

Assessment approach

5.3.5 The assessment of the baseline ecology at the Application Site was undertaken in accordance with the CIEEM Guidelines as referred to in Section 5.1 above.

5.3.6 The Guidelines propose an approach to valuing features that involves professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered.

5.3.7 The Guidelines recommend that the importance or potential importance of an ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:

- International and European;
- National (England);
- Regional (Thames Valley);
- County (Oxfordshire); and
- Local (Cherwell District and Bicester Area).

5.3.8 Ecological features that are identified as having an importance of lower than the Local level are scoped out Ecological Impact Assessment (on the basis that effects on these features would be insignificant) except where these are subject to legal protection.

Valuing designated sites

5.3.9 Some sites have already been assigned a level of nature conservation value through designation and the Guidelines recommend that the reasons for this designation need to be taken into account within the assessment. Such designations include:

- Internationally important sites such as SACs, SPAs and Ramsar sites;
- Nationally important sites such as SSSIs and NNRs; and
- Regional/County/District important sites, including statutorily designated Local Nature Reserves (LNRs) and locally designated non-statutory sites, referred to as Local Wildlife Sites (LWSs) in Oxfordshire.

5.3.10 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing habitats

5.3.11 The Guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available, such as those listed on

Annex 1 of the Habitats Directive, or those listed as habitats of principal importance under Section 41 of the NERC Act 2006. Where areas of a habitat or plant communities do not meet the necessary criteria for designation at a specific level, the Guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Valuing species

5.3.12 The Guidelines require consideration of all protected species as 'important' features within the assessment, where there is the potential for a breach in legislation. More generally, species should be assessed according to their biodiversity value as well as their legal protection. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. The valuation of populations should make use of any relevant published evaluation criteria.

Characterising potential impacts

5.3.13 The Guidelines require the assessment of impacts that are expected to occur to be undertaken in relation to the baseline conditions within the potential zone of influence (i.e. the area within which potential ecological impacts may occur due to activities/changes associated with the Development) and as if the Development were not to take place. Having identified the activities likely to cause significant effects, it is then necessary to describe the resultant changes and to assess the impact on Important Ecological Features (IEFs). The identified potential zone of influence for each IEF are given within Appendix 8.1.

5.3.14 The Guidance recommends that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the zone of influence during the lifetime of the Development.

5.3.15 When describing changes/activities and impacts on ecosystem structure and function, reference should be made to the following parameters:

- Positive or negative (referred to as beneficial or adverse in the interests of consistency with other chapters within this ES) – i.e. does the change/activity improve or reduce the quality of the environment for each IEF;
- Extent – the spatial or geographical area over which the effect of the activity may occur;
- Magnitude – where possible, an effect should be quantified and expressed in absolute or relative terms;

- Duration – effects may be described as short, medium or long-term and as permanent or temporary and defined in relation to ecological characteristics (such as the life cycle of a species), as well as human timeframes;
- Timing – what time of year will the activity occur in relation to ecological seasons or critical life-stages of species;
- Frequency – how often will the activity occur; and
- Reversibility – will recovery from the effect be possible within a reasonable timescale or will the effect be counteracted by mitigation.

5.3.16 In order to characterise the likely change and impact, it is necessary to take into account all the above parameters.

Assigning significance

5.3.17 Legislation and policy guidance often require significant adverse or beneficial effects to be distinguished from others, although there is little guidance on how this distinction should be made. The Guidance defines ecologically significant impacts as effects that *"either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general"*.

5.3.18 If an impact is not found to be significant at the level at which the feature has been valued, it may however still be significant at a more local level. An impact that is of significance at or below a local level, or is deemed not to be significant, will otherwise be scoped out of the impact assessment.

5.3.19 Although certain species and habitats may not constitute Important Ecological Features (IEFs) based upon their nature conservation value they may still warrant consideration during the design and mitigation of the Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues. Such consideration has therefore been given to badgers within this assessment where potential impacts upon their foraging (and potential sett building) habitat may arise.

Significance criteria

5.3.20 Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential IEF, the value of the feature is then used to help determine the geographical scale at which the impact is significant. The significance of the potential impacts upon IEFs has been assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual effects of the Development.

Limitations and Assumptions

5.3.21 Baseline ecological surveys only represent a snap-shot in time and will require updating after certain periods of time to check if conditions have remained the same. Limitations to the individual surveys that were undertaken are provided within the Ecological Baseline Report (**Appendix 5.1**).

Residual and Cumulative Effects

5.3.22 The significance of the effects upon Important Ecological Features (IEFs) has been assessed both before and after consideration of additional measures (e.g. mitigation). The latter represents the assessment of the residual effects of the Proposed Development. Finally, an assessment of cumulative effects upon IEFs arising from the Proposed Development in combination with proposed, consented or planned development within the zone of influence of the Application Site is undertaken.

5.4 BASELINE CONDITIONS

The current baseline

5.4.1 The baseline conditions within the Application Site and surrounding Study Area (where relevant), which have informed the subsequent evaluation and ecological assessment, are detailed in full within **Appendix 5.1** and are summarised below.

Designated sites

Statutory designated sites

5.4.2 The Application Site is not covered by any statutory designations, nor are there any international designations (European Sites) within 10km. No European Sites are judged to be at risk of adverse impacts resulting from the Proposed Development and therefore an Appropriate Assessment of the proposals, in line with The Conservation of Habitats and Species Regulations 2017, is not required.

5.4.3 The only national designation occurring within the standard 5km search radius is Bure Park LNR, which lies 1.5km away to the northwest. This eight-hectare park contains grass meadow, young broad-leaved woodland, hedges and scrub. A small river (the Bure) runs through it, feeding a small pond which supports great crested newts. There are no surface hydrological or green ecological links between the Application Site and Blure Park. Whilst the Langford Brook meets the River Blure, this occurs downstream of the LNR area. In addition, due to the small scale of the proposed development and the extensive green space provided within the Application Site boundary, there is very limited potential for an increase in recreational pressure on this site as a result of the Proposed Development. Therefore, Blure Park LNR will not be taken forward as an IEF in the assessment.

5.4.4 The following national designations (SSSI), which lie beyond the 5km search radius around the Application Site, have been identified through pre-application consultation with Natural England to be IEFs owing to the potential for downstream impacts via adverse changes in water quality and/or flow within Langford Brook:

- Wendlebury Meads and Mansmoor Closes SSSI (5.4km SW)
- Otmoor SSSI (7.2km SSW.

5.4.5 The location of these SSSIs and Blure Park LNR in relation to the Application Site is shown on **Figure 5.1**.

Non-statutory designated sites

5.4.6 There are six Local Wildlife Sites (LWS), one Cherwell District Wildlife Sites (CDWS), three proposed CDWS and a Conservation Target Area (CTA) within 2km of the Application Site, the Ray Conservation Target Area and Gavray Drive Meadows LWS, which partially cover the Application Site. The location of these designations in relation to the Application Site is shown on **Figure 5.2**.

5.4.7 Gavray Drive Meadows LWS and Ray CTA partially cover the Application Site and will be taken forward as IEFs of County-level ecological importance. However, owing to their spatial separation and/or lack of ecological connections with the Application Site, the remaining non-statutory designations occurring within 2km or beyond are not considered to be at risk of significant adverse impacts resulting from the proposed development and will not be taken forward as IEFs.

Habitats and Vegetation

5.4.8 The Application Site is divided by Langford Brook. Land to the west of the brook comprises two arable fields of very limited value except for some margins which support uncommon arable weed species. Land to the east of the brook predominantly comprises fields of species-rich grassland ranging from Local to County importance, with discrete areas of locally valuable marshy grassland present, often associated with ponds.

5.4.9 The majority of the high value grassland areas have been left unmanaged for at least 15 years, which has allowed significant encroachment of scrub and tall herb communities, resulting in an overall reduction in both their quantity and quality. Similarly, many former hedgerows have developed into broad bands of scrub and young woodland. A detailed account of the habitats present, including a condition assessment for the purposes of completing the Biodiversity Impact Assessment, is provided in **Appendix 5.1**.

5.4.10 The current distribution of habitats within this Site is illustrated on **Figure 5.3**. Those habitats and flora of sufficient value for inclusion as IEFs in the assessment are summarised in **Table 5.1** below.

Table 5.1: Important Habitats and Flora

IEF	Summary	Level of Ecological Importance
Unimproved and Species-rich Semi Improved Neutral Grassland	Small areas within F3, F7, F11 and F12. Showing examples of NVC communities MG1b, MG1c, MG4, MG6b and MG5c	County
Semi Improved Neutral Grassland	Discrete areas within F4, F5, F6, F8, F9. Including poorer examples of NVC communities MG6b and MG9a	Local
Marshy Grassland and Swamp	Discrete areas within Fields F1, F2, F3, F8, F9 and F10. Including examples of NVC communities MG9a, MG10b, M23b and S7	Local - County
Broad leaved Semi Natural Woodland	In many patches across the Application Site. Mostly developed from mature dense scrub and also incorporates mature standards	Local
Veteran and Mature trees	Several veteran and mature trees across the Application Site	Local
Hedgerows	Many former hedgerows have expanded out into the adjacent fields to form large blocks of dense scrub. 12 discernible hedgerows are currently present, two of which qualify as 'Important' under the Hedgerows Regulations	Local
Ponds	Several ponds across the Application Site most of which are currently in poor condition, being silted and overshaded and subject to regular drying	Local
Water course	Langford Brook runs through the centre of the Application Site and forms a wildlife corridor	Local
Arable weeds	Several uncommon species associated with the margins in Fields F13 and F14	Local

Fauna

5.4.11 A detailed account of the protected and notable species present within and around the Application Site is provided in **Appendix 5.1**. Those species or species assemblages of sufficient value for inclusion as IEFs in the assessment are summarised in **Table 5.2** below.

Table 5.2: Important Species/Species Assemblages

IEF	Summary	Level of Ecological Importance
Wintering Bird Assemblage	No species recorded that are considered to be of significant ecological value but a good diversity and abundance of species recorded	Local
Breeding Bird Assemblage	The majority of species associated with the woodland, hedgerows, and scrub; the limited size of other habitats, such as wetland habitats, reduces the potential for large populations of habitat specialists	Local
Barn owl	Potential nesting or roosting in mature trees but not recorded recently	Less than Local (legally protected)
Bat Assemblage	Potential (unconfirmed) roosting in mature trees and a moderate assemblage of predominantly of common and widespread species using the Application Site for foraging and commuting	Local
Otter	Langford Brook likely forms part of a wider otter territory	Local
Water vole	Potential very small population present on Langford Brook	Less than Local (legally protected)
Badger	No setts or other signs detected during surveys, but report of badgers received during EIA scoping and presence assumed on a precautionary basis	Less than Local (legally protected)
Amphibian Assemblage	Assemblage includes a medium sized metapopulation of great crested newts breeding in ponds within and adjacent to the Application Site, and using rough grass and scrub habitats in their terrestrial phase	Local-County
Reptiles	A large population of common lizard and a small population of grass snake, supported by the mosaic of rough grass, tall herb and scrub habitats	Local-County
Invertebrate Assemblage	A very diverse assemblage of invertebrates supported by the mosaic of species-rich grassland, scrub, hedgerow, woodland and aquatic habitats	Regional

The projected future baseline

5.4.12 The most valuable habitat areas within the Application Site, namely those covered by the LWS designation, have had little to no management for at least 15 years. Therefore there is a trend of increasing scrub encroachment into the historically more open species-rich grassland habitats. Similarly, ponds have become heavily shaded and overgrown. This trend has favoured species associated with rank grass, scrub and woodland, but has been detrimental to species associated with open short grasslands and bare ground.

5.4.13 In the absence of development (and associated long-term restoration and management plan) it is very likely that scrub coverage would continue to increase, and the grassland habitat would decrease and eventually disappear. This would reduce the variety of habitats present and the variety of invertebrate and vertebrate species supported by the Application Site would also decrease, to the detriment of Gavray Drive Meadows LWS and the Ray CTA.

5.4.14 The three grassland fields in the central and eastern area of the Application Site, largely outside of the LWS but inside the CTA are currently cut for hay/silage but the timing is sub-optimal which suppresses botanical diversity. In the absence of development (and associated long-term restoration and management plan) it is likely that botanical diversity would slowly decrease, to the detriment of the Ray CTA.

5.4.15 The arable fields and associated field boundaries in the west of the Application Site are already heavily degraded by annual cultivation. In the absence of development, the ecological value of this area would remain broadly unchanged.

5.5 POTENTIAL EFFECTS

Introduction

5.5.1 An assessment of likely significant effects of the Proposed Development on those IEFs identified above has been undertaken based on the submitted Parameter Plans and detailed access plans. The quantum and layout of the Proposed Development set out in the Parameter Plans incorporate inherent or embedded ecological mitigation as a result of an iterative assessment and design process, namely:

- Retention, and buffering from development, of important habitat features and areas, including the entirety of Gavray Drive Meadows LWS and other non-designated habitats including semi-improved neutral grassland in field F3, hedgerows, ponds and mature trees;

- Limiting public access provision within Gavray Drive Meadows LWS to the least sensitive northern fields (F5, F6 and F10) whilst creating a circular pedestrian route linking on-site and off-site green infrastructure; and

- A wide development buffer to the west of Langford Brook, primarily due to flood plain constraints, enabling conversion of the current arable land in this area to informal open space of potentially greater ecological value.

5.5.2 In addition to the above, the Open Space Parameter Plan defines specific open space typologies, each of which has different ecological value/potential, including an Ecological Restoration Zone (comprising existing habitats within Gavray Drive Meadows LWS and areas of the CTA east of the Langford Brook), informal/natural green space (new POS areas designed for biodiversity) and formal/amenity green space (new POS areas designed for amenity use and with limited biodiversity potential). Whilst these represent firm commitments to the delivery of appropriate Green Infrastructure, the detailed design and implementation of the open space/landscape strategy is treated as additional rather than inherent mitigation.

5.5.3 The likely effects are assessed with the inherent mitigation included, but in the absence of the additional mitigation measures required to address potentially significant effects. Anticipated effects during the construction and post-completion stage of the Proposed Development are discussed in turn below.

Construction stage

5.5.4 Generalised effects which could arise as a result of the construction of the Proposed Development in the absence of mitigation include the following:

- Effects of direct habitat loss, damage and degradation due to land take upon habitats and species;
- Impacts of noise, light and human disturbance to species; and
- Pollution of groundwater and surface water flows, as further described in Chapter 7 of the ES (Water Resources).

Statutory designated sites

5.5.5 No direct effects upon any statutory designated sites are anticipated during construction. However the potential for downstream hydrological impacts, via adverse changes in water quality and/or flow within Langford Brook, has been identified on the following national designations:

- Wendlebury Meads and Mansmoor Closes SSSI (5.4km SW of the Application Site); and
- Otmoor SSSI (7.2km SSW of the Application Site).

5.5.6 These SSSI's support wet meadow and floodplain grazing marsh habitats respectively and are therefore potentially at risk from changes in water quality or run-off rates in the local river catchment.

5.5.7 Chapter 7 of the ES (Water Resources) identifies that construction of the Proposed Development could alter the characteristics of flooding (in terms of frequency, extent, depth or duration of flooding) downstream of the Application Site as a result of increased surface water run-off from the Application Site. This is assessed as being a 'moderate' adverse effect on a local scale.

5.5.8 Chapter 7 also identifies that the following construction activities could potentially alter water quality within the Application Site and therefore in the Langford Brook:

- Construction plant movement and enabling ground works areas could result in the mobilisation and generation of contaminated run-off, comprising soil, sediment, and/or other construction materials;

- Accidental spillage of fuels or other contaminating substances could cause polluted run-off;

- Discharge of groundwater from any necessary dewatering of excavations could be contaminated with soil, sediment, and/or other construction materials; and

- Owing to the agricultural use of land west of Langford Brook, the soil may be rich in nutrients such as phosphorus and nitrogen. Construction plant movement, enabling ground works, and groundwater dewatering activities could therefore mobilise any 'residual' organic pollutants.

5.5.9 This is assessed as being a 'moderate' adverse effect on a local scale.

5.5.10 It is likely that these local scale effects would be substantially ameliorated at the locations of the SSSIs owing to the distance of separation downstream. This is particularly the case for Otmoor SSSI, which lies in the floodplain of the River Ray, to which the Langford Brook is a tributary, rather than being connected to the Langford Brook directly. These hydrological effects are therefore judged to be minor adverse, temporary, reversible, not certain and significant at a County level.

Non-statutory designated sites

5.5.11 A small area of the Ray CTA is located to the west of Langford Brook. This area lies outside of the residential development area but will be directly affected during construction by floodplain remodelling works and the current habitat will be lost. However, the affected habitat is arable farmland and a narrow strip of tall ruderal habitat, such that the effect on the CTA would be negligible.

5.5.12 The area of the Ray CTA located to the east of the Langford Brook, most of which is also covered by Gavray Drive Meadows LWS, lies outside of the residential development area. Whilst no direct effects or habitat losses within these designated sites are therefore anticipated, there is potential for a range of indirect adverse effects to occur during the construction of the eastern development area as described below.

- Indirect hydrological effects on wetland habitats within the CTA and LWS, as a result of adverse changes in surface water quality and run-off rates, are described above with respect to Statutory Designated Sites. Effect judged to be minor adverse (due to limited interface between development footprint and sensitive habitats), temporary, reversible, not certain, significant at a Local level;

- Damage or deterioration of habitats in close proximity to the construction zone, including physical damage from machinery or personnel, pollution from dust, fuels/chemicals and waste materials. Effect judged to be minor adverse (due to limited interface between development footprint and sensitive habitats), temporary, reversible, not certain, significant at a Local level; and

- Disturbance of species present in habitats in close proximity to the construction zone from noise and movement of machinery and personnel, and/or artificial lighting. Effect judged to be minor adverse (due to limited interface between development footprint and affected habitats), temporary, reversible, not certain, significant at a Local level.

5.5.13 Chapter 9 of the ES (Air Quality) includes an assessment of the risk of harm to ecological receptors from dust emissions during construction. With reference to IAQM guidance[3], Gavray Drive Meadows LWS is the only pertinent ecological receptor and, in consultation with EDP, has been identified as being a low sensitivity receptor, and the risk of impacts during construction is considered to be low in the absence of mitigation.

Habitats and Flora

5.5.14 A full account of all habitat losses resulting from the Proposed Development is contained within the Biodiversity Impact Assessment (**Appendix 5.2**). Direct and indirect effects on habitats which are IEFs are considered further below.

Grassland

5.5.15 None of the important grassland habitats present within the Application Site will be directly affected by construction activities. However, where these habitats are present in close proximity to the construction zone, they are at risk of damage or deterioration as described above in respect of the CTA and LWS. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Broadleaved woodland

5.5.16 The construction of the eastern development area will result in the removal of 0.45ha broadleaved woodland located between fields F10 and F1. This represents 16% of the existing woodland area across the Application Site, and the area in question is a poor example having developed relatively recently due to neglect of a former hedgerow. The

[3] IAQM, "Guidance on the Assessment of Dust from Demolition and Construction" (Institute of Air Quality Management (IAQM)), February 2014)

effect of this direct loss is judged to be minor adverse, permanent, irreversible, certain, and significant at a Local level.

5.5.17 Where retained broadleaved woodland is present in close proximity to the construction zone, they are at risk of damage or deterioration as described above in respect of the CTA and LWS. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Hedgerows

5.5.18 The construction of the western development area will result in the removal of two small sections of hedgerow, totalling c.25m in length, located between fields F13 and F14. This represents 2% of the existing hedgerow length across the Application Site. The effect of this direct loss is judged to be insignificant.

5.5.19 Where retained hedgerows are present in close proximity to the construction zone, they are at risk of damage or deterioration as described above in respect of the CTA and LWS. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Veteran and mature trees

5.5.20 With reference to the detailed Arboricultural Assessment which accompanies the planning application (Appendix 8.3), direct impacts on the existing tree stock (removals) are summarised in Table 5.3.

Table 5.3: Summary of Tree Losses

Arboricultural Category	Existing	Trees, Groups and Hedgerows Lost Due to Proposals	Trees, Groups and Hedgerows Affected by Proposals	Trees, Groups and Hedgerows Unaffected by Proposals
Category A	4	0	0	4
Category B	25	0	2	23
Category C	6	0	3	3
Totals	**35**	**0**	**5**	**30**

5.5.21 All losses are partial losses of tree groups and hedgerows, representing a very small proportion of the exiting stock, and with no Category A or Veteran trees directly affected. The effect of this direct loss is judged to be insignificant.

5.5.22 Where retained veteran and mature trees are present in close proximity to the construction zone, they are at risk of damage or deterioration as described above in respect of the CTA and LWS. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Ponds

5.5.23 The construction of the eastern development area will result in the loss of pond P4 which is located in field F1. Measuring approximately 300m^2, this represents 10% of the existing pond area within the Application Site, and the pond in question is a poor example being heavily overgrown and shaded. The effect of this direct loss is judged to be minor adverse, permanent, irreversible, certain, and significant at a Local level.

5.5.24 Retained ponds are not fed by surface water from the development footprint and therefore no hydrological effects are predicted during construction. However, where retained ponds are present in close proximity to the construction zone, they are at risk of damage or deterioration as described above in respect of the CTA and LWS. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Water course

5.5.25 The construction of the western development area will result in the loss a very small proportion of the western bank of the Langford Brook to facilitate the construction of a drainage outfall as part of the surface water drainage system. The effect of this direct loss is judged to be minor adverse, permanent, irreversible, certain, and significant at a Local level.

5.5.26 Indirect hydrological effects Langford Brook during construction, as a result of adverse changes in surface water quality and run-off rates, are described above with respect to Statutory Designated Sites. The effects would be of greater magnitude in the immediate area and therefore these are judged to be moderate adverse, temporary, reversible, not certain and significant at a Local level.

Arable weeds

5.5.27 The arable land west of Langford Brook, and associated field margins found to support uncommon arable weed species, would be permanently lost in the proposed residential development footprint and where floodplain remodelling required. Whilst the creation of public open space in areas not subject to groundworks would not result in direct loss of habitats supporting arable weeds, these are unlikely to survive in the long-term in absence of annual ploughing and would be effectively lost from the Application Site. This effect is

therefore judged to be major adverse, permanent, irreversible (reversible in POS areas where the seedbank survives), certain, and significant at a Local level.

Species

Wintering bird assemblage

5.5.28 The important winter bird assemblage recorded within the Application Site is primarily associated with scrub and grassland mosaic habitats occurring in the eastern portion of the Application Site, rather than the arable habitat. Scrub loss during construction will be relatively limited as a proportion of the existing resource (which is recognised as being 'excessive' with respect to the overall balance of habitats across the Application Site) and therefore the effect of permanent habitat loss on wintering birds is judged to be insignificant.

5.5.29 Wintering birds using habitats in close proximity to the development footprint, particularly in the eastern residential area, are likely to be disturbed temporarily during construction by noise and movement from machinery and personnel. However, for the reasons explained above, the significant extents of scrub elsewhere in the Application Site will provide alternative habitats for wintering birds such that any effect is judged to be insignificant.

Breeding bird assemblage

5.5.30 The important breeding bird assemblage recorded within the Application Site is primarily associated with scrub and grassland mosaic habitats occurring in the eastern portion of the Application Site, rather than the arable habitat. Scrub loss during construction will be relatively limited as a proportion of the existing resource (which is recognised as being 'excessive' with respect to the overall balance of habitats across the Application Site) and therefore the effect of permanent habitat loss on the breeding bird population is judged to be insignificant.

5.5.31 Removal of breeding habitat at inappropriate times of year could result in the injuring or killing of individual birds, their eggs or young. However, such actions would also be an offence under the Wildlife and Countryside Act 1981 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

5.5.32 Breeding birds using habitats in close proximity to the development footprint, particularly in the eastern residential area, are likely to be disturbed temporarily during construction by noise and movement from machinery and personnel. This disturbance could affect breeding

success albeit only a small proportion of the population would be affected. Such effects would be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Barn owl

5.5.33 Only one tree with features capable of supporting nesting/roosting barn owl (T27 as referred to below) is to be removed as part of the Proposed Development and the large majority of suitable foraging habitat is to be retained. Given that no barn owls have been confirmed nesting within the Application Site and the loss of suitable habitat is very minor, effects of habitat loss are insignificant.

Bat assemblage

5.5.34 Out of 27 trees with bat roost potential identified within the Application Site (as shown on **Figure 5.4**), only one (T27) requires removal to facilitate the construction of the eastern residential area and associated access. A dusk emergence survey of T27 was undertaken in June 2021, during which no bats were seen emerging, however due to the often-transitory nature of bat roosting in trees the future presence of roosting bats cannot be ruled out. Given that this effect therefore applies to potential, rather than actual, bat roosting and affects a very small minority (4%) of suitable trees, it is judged to be insignificant.

5.5.35 Removal of a confirmed bat roost could result in the injuring or killing of individual bats. However, such actions would also be an offence under the Conservation of Habitats and Species Regulations 2017 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

5.5.36 Of the remaining 26 trees with bat roost potential, only 2 (T24 and T25, located on the northern boundary of field F1) are sufficient close to the development footprint to be at risk of disturbance from construction noise and lighting. Given that this effect applies to potential, rather than actual, bat roosting and affects a small minority (7%) of suitable trees, it is judged to be insignificant.

5.5.37 With respect to effects on bat foraging and commuting habitats, the highest quality bat habitats occur in the eastern portion of the Application Site and along the Langford Brook. Direct loss of moderate-high quality habitat will occur during construction of the eastern residential area, however, the affected area represents a small proportion of the total resource and includes habitats closest to existing streetlighting along Gavray Drive. Accordingly, the effect of loss of foraging and commuting habitat is judged to be insignificant.

5.5.38 Potential disturbance of retained bat foraging habitats by artificial lighting during construction has been ruled out on the basis that standard hours of operation will be imposed, thereby avoiding works after dark during the bat activity season.

Otter

5.5.39 No actual or potential otter breeding or resting places have been recorded along the stretch of Langford Brook within the Application Site, and therefore no impacts on such features would occur during construction. Foraging otter could be temporarily disturbed during floodplain remodelling works and/or construction of the drainage outfall in Langford Brook, however otters are nocturnal, and on the basis that construction activities will be generally limited to daylight hours, and such effects are judged to be insignificant.

Water vole

5.5.40 The presence of water vole on Langford Brook has been assumed on a precautionary basis having recorded unconfirmed burrows and feeding signs. Works affecting the banks of Langford Brook could therefore result in loss of potential/actual breeding sites or resting places. However, this will be limited to the construction of a single drainage outfall at the southern end of the watercourse which will affect a very small proportion of the total bank, and the effect on the water vole population is therefore judged to be insignificant.

5.5.41 Works to banks with occupied water vole burrows could result in the injuring or killing of individual water voles. However, such actions would also be an offence under the Wildlife and Countryside Act 1981 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

Badger

5.5.42 No badger setts have been recorded within the Application Site, however, the drier areas of woodland and scrub habitat offer ideal locations for badger setts and the grasslands provide foraging habitat. Direct loss or disturbance of such habitats during construction will be minimal as proportion of the existing habitat, such that the effect on any badger population (if present) would be insignificant.

5.5.43 Removal of vegetation and groundworks within and around an active badger sett could result in the disturbance of the sett or the injuring or killing of individual badgers. However, such actions would also be an offence under the Protection of Badgers Act 1992 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

Great crested newts (and other amphibians)

5.5.44 Construction of the eastern residential area will result in the loss of pond P4, which has been found to support great crested newt breeding, and terrestrial habitats (rough grassland and scrub) which are likely to be used for foraging, refuge and dispersal and potentially hibernation during winter. The loss of pond habitat represents 10% of the existing breeding habitat, whereas the proportion of optimal terrestrial habitat to be lost is likely to less than this. The effect of this direct loss is judged to be moderate adverse, permanent, irreversible, certain, and significant at a Local-County level.

5.5.45 Whilst within the theoretical dispersal range of the great crested newt breeding ponds in the eastern portion of the Application Site, it is considered very unlikely that this species will be present within the arable land and other habitats west of Langford Brook, due to both the paucity of suitable habitat and the barrier to dispersal posed by the brook. Effects of habitat loss in the western portion of the Application Site are therefore judged to be negligible.

5.5.46 Clearance of aquatic and terrestrial habitat in the development footprint could result in the injuring or killing of individual great crested newts. However, such actions would also be an offence under the Conservation of Habitats and Species Regulations 2017 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

5.5.47 The additional effect of damage or deterioration of retained aquatic and terrestrial habitats in close proximity to the development footprint in the east of the Application Site is judged to be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Reptiles

5.5.48 The reptile (primarily common lizard) population recorded within the Application Site is associated with scrub and grassland mosaic habitats occurring in the eastern portion of the Application Site. The fields directly affected by the eastern residential development area, namely F1, F10 and F15, supported relatively low numbers during the 2020 survey (with F1 not sampled at all due scrub encroachment) but higher numbers have been recorded here historically. It is estimated that less than 10% of optimal reptile habitat would be directly lost during construction. The effect of this direct loss is judged to be minor adverse, permanent, irreversible, certain, and significant at a Local-County level.

5.5.49 Clearance of aquatic and terrestrial habitat in the development footprint could result in the injuring or killing of individual reptiles. However, such actions would also be an offence under the Wildlife and Countryside Act 1981 (as amended), compliance with which is assumed as being inherent to the Proposed Development. Therefore, no significant effect is anticipated.

5.5.50 The additional effect of damage or deterioration of retained reptile habitat in close proximity to the development footprint in the east of the Application Site is judged to be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Invertebrate assemblage

5.5.51 The diverse invertebrate assemblage recorded within the Application Site is associated with the mosaic of species-rich grassland, scrub, hedgerow, woodland and aquatic habitats occurring in the eastern portion of the Application Site. Of the fields directly affected by the eastern residential development area, namely F1, F10 and F15, only F1 could be described as being of particular importance to the invertebrate assemblage, as it contains remnants of species-rich grassland and large extent of scrub edge transition habitat. However, the outgrown hedgerow/scrub band on the northern boundary of F10 (which will be retained but substantially reduced in width) has consistently been found support good numbers of eggs of the brown hairstreak butterfly, which is one of the key species of conservation concern present in the Application Site.

5.5.52 Similar to other species reliant upon the mosaic of species-rich grassland, scrub and woodland, it is estimated that less than 10% of high-quality invertebrate habitat would be directly lost during construction. The effect of this direct loss is judged to be minor adverse, permanent, irreversible, certain, and significant at a Local-County level.

5.5.53 The additional effect of damage or deterioration of retained habitats of value to invertebrates in close proximity to the development footprint in the east of the Application Site is judged to be minor adverse, temporary, reversible, not certain, and significant at a Local level.

Post-development stage

5.5.54 Generalised effects which could arise as a result of the operation of the Proposed Development, in the absence of mitigation, include the following:

- Increased recreational pressures;
- Effects of light and noise/visual/human disturbance to habitats and species;
- Increased risk of collision to species arising from increased traffic movements;
- Increased levels of airborne pollutants due to emissions of nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$) and dust (see Chapter 9 – Air Quality); and
- Alteration of surface water and groundwater flow quality and quantity.

Statutory designated sites

5.5.55 No direct effects upon any statutory designated sites are anticipated post-development. However, the potential for downstream hydrological impacts, via adverse changes in water quality and/or flow within Langford Brook, has been identified on Wendlebury Meads and Mansmoor Closes SSSI and Otmoor SSSI.

5.5.56 Chapter 7 of the ES (Water Resources) identifies that the operation of the Proposed Development will result in currently undeveloped permeable land being developed with the construction of buildings, highways and other hard surfaces. Accordingly, this could increase the rate and volume of surface water run-off entering the Langford Brook. However, the assessment refers to the proposed surface water drainage system to be installed as part of the Proposed Development, which is treated as 'embedded mitigation'. This will intercept, manage and release rainfall run-off from the Application Site at a controlled rate, to ensure post-development peak run-off rates are not increased compared to the baseline situation and hence that additional flows are not discharged to the downstream catchments. On this basis the effect would be negligible.

5.5.57 Chapter 7 also identifies that the following operations could potentially alter water quality within the Application Site and therefore in the Langford Brook:

- Surface water run-off from highways and other hard surfaces could result in the generation of contaminated run-off, comprising soil, sediment, salt or other particles; and

- The accidental spillage of fuels or other contaminating substances could cause polluted run-off.

5.5.58 As above, the assessment in Chapter 7 refers to the proposed surface water drainage system, which is treated as 'embedded mitigation'. This will include the use of SuDS features, catch pits, and trapped gullies, prior to water being discharged to the downstream catchment. Such measures will remove hydrocarbon pollutants and suspended solids (via settlement), and thereby ensure a high-quality discharge from the Application Site to the downstream catchment. On this basis the effect would be negligible.

Non-statutory designations

5.5.59 The area of the Ray CTA and Gavray Drive Meadows LWS to the east of Langford Brook is located in the floodplain, and the wet meadow plant communities present rely upon the existing annual cycle of winter flooding. Proposed floodplain remodelling on the western side

of Langford Brook (namely lowering of levels beside the brook and raising levels where development is proposed) could therefore potentially lead to adverse changes to the flood regime in the CTA and LWS.

5.5.60 The effect of the proposed levels changes on the flood regime has been considered in detail within Chapter 7 of the ES and associated Flood Risk Assessment. The post-development flood risk model demonstrates that there is no increase in flood extent (i.e. no new areas at risk of flooding) as a result of the levels changes but that during the 1 in 100-year (+35%) flood event there is a minor increase in flood depths within the LWS for relatively short periods of time. The maximum increase in flood depth is c.80mm, which lasts for c.3.5hours around the very peak of the event. The model predicts an increase in depths within the LWS above existing levels for a total of c.22hours. Outside of this timeframe the depths for pre and post development are no different. These temporary increases in flood depth, during periods where flooding already occurs, are not predicted to result in any changes to the botanical composition or value of the CTA or LWS. Therefore no adverse effects are predicted.

5.5.61 Potential hydrological effects on wetland habitats within the CTA and LWS in respect of water quality and run-off rate are similar to those described above in respect of Statutory Designated Sites. Similarly, based on the embedded mitigation in the form of the surface water drainage system, such effects would be negligible.

5.5.62 Following completion of the Proposed Development, the CTA and LWS are at risk of potential adverse effects as a result of increased recreational pressure arising from increased housing in close proximity. This has the potential to damage and degrade valuable ground flora and trees through trampling and littering, and disturb associated fauna occurring within the LWS including birds, mammals, amphibians and reptiles.

5.5.63 Such effects will be partially offset through the provision of formal (including play areas) and informal open space immediately adjacent to the proposed residential areas as shown on the submitted Open Space Parameter Plan. It is also predicted that the existing level of disturbance and damage to habitats within the LWS (including rough camping, littering/fly tipping and fires) would reduce as a result of natural surveillance along the main access points into the Application Site from Gavray Drive and from having local residents in closer proximity. However, in the absence of additional mitigation, this effect is judged to be moderate adverse, permanent, irreversible, not certain, and significant at a Local-County level.

5.5.64 Chapter 9 of the ES (Air Quality) includes an assessment of potential air quality impacts from increased vehicle emissions. The results of this analysis are that the impact of the Proposed Development, assuming no improvement in vehicle emissions or background

concentration, was Negligible at all receptor locations for NO_2, PM_{10} and $PM_{2.5}$. Therefore, the predicted effects of the Proposed Development were concluded to be Not Significant.

Habitats

5.5.65 The vast majority of important habitats to be retained post-development are situated within the CTA and LWS, and therefore at risk of the same effects of increased recreational pressure as described above. Similarly, potential hydrological and flood risk effects on the Langford Brook and other wetland habitats are negligible for the reasons described above.

Species

Wintering and breeding bird assemblage

5.5.66 Retained habitats supporting wintering and breeding birds (in particular woodland, scrub and tall grassland) are potentially at risk of disturbance and damage post-development, and an increase in domestic cats and dogs in the vicinity would increase the risk of predation and disturbance of birds. Owing to the large extent of available habitat, these effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local level.

Barn owl

5.5.67 Potential post-development effects on barn owl are increased collision risk, light spill and disturbance upon habitats used for foraging and nesting. Owing to the large extent of available habitat, most of which is sufficiently separated from the proposed development areas, these effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local level.

Bat assemblage

5.5.68 Potential post-development effects on the bat population are increased collision risk, light spill and disturbance upon habitats used for foraging, commuting and roosting. Owing to the large extent of available habitat, most of which is sufficiently separated from the proposed development areas, these effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local level.

Otter

5.5.69 Post-development hydrological effects on the Langford Brook are judged to be negligible for the reasons described above.

5.5.70 Potential disturbance effects on otters foraging along the riparian corridor post-development are judged to be negligible owing to the separation distances between the brook and the residential development parcels, and limited usage of adjacent POS when otters are active.

Water vole

5.5.71 Post-development hydrological effects on the Langford Brook are judged to be negligible for the reasons described above.

5.5.72 Riparian habitat potentially supporting water vole is potentially at risk of disturbance and damage post-development, and an increase in domestic cats and dogs in the vicinity could increase the risk of predation and disturbance of water voles. These effects are judged to be insignificant owing to the small/unproven presence of this species on the Application Site.

Badger

5.5.73 Potential post-development effects on badger are increased collision risk, light spill and disturbance of setts or foraging habitats, and an increase in domestic dogs in the vicinity could increase the risk of disturbance of badgers. These effects are judged to be insignificant owing to the small/unproven presence of this species on the Application Site and the extent of available habitat.

Great crested newts (and other amphibians)

5.5.74 Post-development hydrological effects on great crested newt breeding ponds are judged to be negligible for the reasons described above.

5.5.75 Aquatic and terrestrial habitats supporting great crested newt are potentially at risk of disturbance and damage post-development as described above in respect of the CTA and LWS. Additional potential adverse effects include the introduction of fish into ponds. Such effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local level.

Reptiles

5.5.76 Scrub and grassland habitats supporting reptiles are potentially at risk of disturbance and damage post-development, and an increase in domestic cats and dogs in the vicinity could

increase the risk of predation and disturbance of reptiles. Such effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local level.

Invertebrate assemblage

5.5.77 The vast majority of habitats of importance to invertebrates are to be retained post-development within the CTA and LWS, and therefore at risk of the same effects of increased recreational pressure as described above although invertebrates are less likely to be disturbed by increased recreational usage. Such effects are judged to be minor adverse, permanent, irreversible, not certain, and significant at a Local-County level.

5.6 MITIGATION MEASURES

Introduction

5.6.1 Overall, negative effects have been avoided or reduced through inherent mitigation incorporated into the Parameter Plans accompanying the application. However, not all potential negative effects can be avoided or reduced in severity through inherent mitigation alone. This section identifies any additional mitigation measures required to avoid, reduce, or offset the potential for such significant negative impacts. The key mechanisms described include measures to:

- Conform with relevant and pertinent legislative requirements, particularly those associated with legally protected species; and
- Deliver and, where possible, maximise opportunities for biodiversity enhancement and gain through the Proposed Development.

5.6.2 The key mitigation delivery mechanisms to be implemented are summarised below.

Detailed Design Measures

5.6.3 An outline application for the Proposed Development is being made with all matters reserved except access. The indicative masterplan is therefore illustrative and allows flexibility for specific detailed design measures to be secured and included within the Proposed Development. Such detailed design measures can, where necessary, be agreed with the Council, secured through suitably worded planning conditions, and addressed at the Reserved Matters stage for each phase of the development.

5.6.4 Aspects of the detailed design which are especially relevant are as follows:

- Street lighting – to be designed to avoid impacts on nocturnal wildlife where in close proximity to retained habitats;
- Surface water drainage system – to be designed to maintain/improve water quality and maintain existing run-off rates, and provide additional wetland habitat; and
- Soft landscape scheme (see below) – to be designed to include new habitats of ecological value within the public open space.

Construction Environmental Management Plan (CEMP)

5.6.5 A Construction Environmental Management Plan (CEMP) will be prepared and implemented during the entirety of the construction stage to ensure appropriate management and operational systems are in place to avoid or minimise adverse pollution effects. Further details on the measures to be included in the CEMP are provided within Chapter 7 of the ES (Water Resources) and in the Air Quality and Noise Assessments.

5.6.6 The CEMP can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

Ecological Construction Method Statement

5.6.7 The Ecological Construction Method Statement (ECMS) will set out in detail the measures to be implemented to protect IEFs during the construction phase of the Proposed Development. It is proposed that the implementation of the ECMS will be overseen by an appointed Ecological Clerk of Works (ECoW), whose scope and remit will be set out within the ECMS. This document will cross reference with the CEMP, where relevant, and a detailed Arboricultural Method Statement (AMS) which will set out measures to protect trees and hedgerows during the construction phase.

5.6.8 The ECMS (and AMS) and appointment of the ECoW can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

Ecological Management Plan

5.6.9 The Open Space Parameter Plan defines specific open space typologies, each of which has different ecological value/potential, including an Ecological Restoration Zone (ERZ) comprising existing habitats within Gavray Drive Meadows LWS and areas of the CTA east of the Langford Brook which are to be retained as part of the Proposed Development. In accordance with Policy Bicester 13 of the Local Plan, a full Ecological Management Plan (EMP) has been prepared for the ERZ and accompanies the planning application (**Appendix 5.3**).

5.6.10 The EMP sets out a package of restoration and enhancement measures and suitable ongoing management to deliver a range of benefits for wildlife. It also includes measures to manage access in the ERZ by existing and new local residents, so it can be enjoyed by the public without detracting from its primary objective of ecological protection enhancement. Funding and delivery of the EMP is to be secured via s106 obligation attached to the planning permission.

Soft Landscape Scheme and Landscape Management Plan

5.6.11 In addition to the ERZ, the Proposed Development incorporates additional areas informal/natural green space (new POS areas designed for biodiversity) and formal/amenity green space (new POS areas designed for amenity use and with limited biodiversity potential) as shown on the Open Space Parameter Plan. A detailed Soft Landscape Scheme (SLS) will be prepared for these areas at the detailed design/reserved matters stages, which will be accompanied by a Landscape Management Plan (LMP) detailing measures to establish and the maintain the new habitats/landscape features.

Construction stage

5.6.12 All necessary surveys are considered to be sufficiently up to date at the time of submission to determine the planning application. However, where relevant and depending on development timescales and phasing, certain detailed species surveys may require updating prior to commencement of development. The findings will be used to inform the measures set out below.

Statutory Designated Sites

5.6.13 Potential adverse hydrological effects on Wendlebury Meads and Mansmoor Closes SSSI and on Otmoor SSSI will be avoided or reduced to insignificant levels by a range of measures to be included in the CEMP. These are detailed in full in Chapter 7 of the ES (Water Resources) and summarised below:

- Minimisation of the extent of bare soils and establishment of vegetation as soon as practicable;
- Provision of temporary surface water drainage systems including settlement lagoons/tanks, designed to accommodate and provide a degree of treatment and attenuation of surface water run-off and groundwater (from any necessary dewatering of excavations), generated from within the construction area;
- Haul roads and material storage areas located outside the Langford Brook floodplain;
- Oil/fuel compounds bunded, and positioned outside the Langford Brook floodplain, with emergency spill kits available;
- Topsoil stockpiles located outside the Langford Brook floodplain, and not left exposed;

- 'Silt curtains' positioned parallel to the banks of Langford Brook; and
- Designated compounds provided for the storage of potential contaminants.

Non-statutory Designated Sites

5.6.14 Potential adverse hydrological effects on Ray CTA and Gavray Drive Meadows LWS will be avoided or reduced to insignificant levels by a range of measures to be included in the CEMP as summarised above.

5.6.15 Potential adverse effects on the CTA and LWS relating to damage, deterioration or disturbance, will be avoided or reduced to insignificant levels by the following:

- CEMP – including pollution prevention and control of hours of operation; and
- ECMS and AMS – including establishment of Ecological Protection Zones around retained habitats, clearly delineated by protective fencing (or other barriers) and signage, where construction activities (including incursion by vehicles or personnel, fires and stockpiling of materials) are excluded.

Habitats

5.6.16 Potential adverse hydrological effects on retained wetland habitats will be avoided or reduced to insignificant levels by a range of measures to be included in the CEMP as summarised above.

5.6.17 Potential adverse effects on retained habitats relating to damage, deterioration or disturbance, will be avoided or reduced to insignificant levels by a range of measures to be included in the CEMP, ECMS and AMS as summarised above.

5.6.18 The measures above will address construction effects on retained habitats, however, habitat losses within the development footprint will be addressed through new habitat creation and enhancement of existing habitats during and after construction. This is discussed further under the post-development mitigation section further below.

Species

5.6.19 Protection of species during construction will be ensured through the provisions of the ECMS. As a general measure aimed at protecting species, "tool box talks" will be provided by a

suitably qualified ecologist to the principal contractor appointed by the Developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species, their habitats is understood.

5.6.20 In addition to the habitat protection measures described above, which will deliver much of the necessary species protection, further measures to be included in the ECMS for each relevant species group are summarised below.

Birds

- Retained nesting and foraging habitats will be included within EPZs; and
- Removal of potential nesting habitat will be undertaken outside the bird breeding season (namely March-August) unless a detailed survey by a suitably experienced ecologist has confirmed that no nests are present in the affected area immediately prior to works commencing.

Bats

- Retained trees with bat roost potential will be included within EPZs;
- Construction activities will be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting;
- Update survey of trees with bat roost potential prior to felling or pruning of trees will be undertaken if required and, if bat roosts are confirmed present, works will cease until an appropriate strategy is devised and agreed;
- Works may require a Natural England (NE) EPS licence to derogate from the legal protection afforded to bats. In order to obtain a licence it must be demonstrated that there will be no detriment to the maintenance of the favourable conservation status of the local bat population; and
- Other retained trees and/or proposed new buildings will provide ample opportunity to provide replacement roosting habitat to mitigate any losses.

Otter and water vole

- Majority of Langford Brook included within EPZs;
- Construction activities will be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting;
- Update survey of the section of Langford Brook to be affected by the drainage outfall prior to construction; and
- In unlikely event that holts/burrows are recorded, aim to avoid impacts by micro-siting of outfall structure or, if impacts cannot be avoided, exclusion of animals from the affected area (under EPS licence in the case of otters, requiring provision of alternative habitat) prior to works.

Badger

- Update check of development footprint and 30m buffer for badger setts prior to works commencing;
- In unlikely event that setts are recorded, aim to avoid impacts by micro-siting of development or, if impacts cannot be avoided, exclusion of animals from the affected area (under NE licence and potentially requiring provision of alternative setts) prior to works; and
- Use of ramps or sloping sides in open excavations to allow for wildlife to escape.

Great crested newt (and other amphibians)

- NE EPS Licence to be obtained prior to the commencement of development. In order to obtain a licence it must be demonstrated that there will be no detriment to the maintenance of the favourable conservation status of the local great crested newt population;
- Creation of new ponds and enhancement of terrestrial habitats (including construction of hibernacula) in the ERZ prior to the commencement of development;

- Exclusion fencing to be erected around the eastern development area (to remain in place throughout the construction period), amphibians captured using pitfall traps and artificial refugia and relocated into receptor habitat in the ERZ prior to vegetation clearance and groundworks;

- Amphibians to be removed from Pond P4 prior to and during it being drained down;

- Vegetation removed and topsoil stripped in the eastern development area under supervision of ECoW; and

- Exclusion fence checked for damage regularly throughout the construction period and repaired if necessary.

Reptiles

- Reptile mitigation to be undertaken in tandem with amphibian mitigation;

- Enhancement of habitats (including initial scrub removal to open up grassland and construction of hibernacula and log/brash piles) in the ERZ prior to the commencement of development;

- Exclusion fencing to be erected around the eastern development area (to remain in place throughout the construction period), reptiles captured using artificial refugia and relocated into receptor habitat in the ERZ prior to vegetation clearance and groundworks;

- Vegetation removed and topsoil stripped in the eastern development area under supervision of ECoW; and

- Exclusion fence checked for damage regularly throughout the construction period and repaired if necessary.

Post-development stage

Statutory Designated Sites

5.6.21 Potential adverse hydrological effects on Wendlebury Meads and Mansmoor Closes SSSI and on Otmoor SSSI will be avoided or reduced to insignificant levels by the detailed design and

implementation of the surface water drainage system as described in Chapter 7 of the ES (Water Resources).

Non-statutory designations

5.6.22 Potential hydrological effects on wetland habitats within the CTA and LWS in respect of water quality and run-off rate will be avoided or reduced to insignificant levels by the detailed design and implementation of the surface water drainage system as described above.

5.6.23 Potential recreational effects on the CTA and LWS will be avoided or reduced to insignificant levels by the provision of attractive useable public open space immediately adjacent to the residential development areas, together with a range of access management measures for the ERZ as set out within the EMP (**Appendix 5.3**).

Habitats

5.6.24 The majority of existing important habitats are situated within the ERZ (i.e. within the CTA and LWS) and will therefore be subject to the measures described above to avoid or mitigate potential adverse recreational and hydrological effects.

5.6.25 Adverse effects of habitat loss will be mitigated and compensated through the wide-ranging habitat restoration and enhancement measures proposed in the ERZ, as set out in detail in the EMP (**Appendix 5.3**) and summarised on **Figure 5.5**, and through the inclusion of new habitats of ecological value within the soft landscaping scheme (SLS) for the development areas.

5.6.26 With reference to the Open Space Parameter Plan and Illustrative Masterplan, new habitats to be included in the SLS are:

- Informal/natural green space - species-rich neutral grassland with scattered trees and shrubs;
- SuDS features - species-rich neutral/wet grassland, open water and marginal vegetation; and
- New native hedgerows -in particular along the northern boundary of the western development area.

5.6.27 The SLS will be accompanied by a Landscape Management Plan (LMP) detailing measures to establish and the maintain the new habitats/landscape features summarised above.

5.6.28 Based on the detailed enhancement proposals set out in the EMP, and illustrative landscape proposals for the development areas, the Biodiversity Impact Assessment for the Proposed Development (detailed in full in **Appendix 5.3**) predicts net gains in both area-based and linear habitats, as summarised in **Table 5.4**.

Table 5.4: BIA Headline Results

	On-site baseline	**On-site post-intervention**	**Total net unit change**	**Total net % change**
Habitat Units	150.96	182.34	31.38	20.79%
Hedgerow Units	6.07	12.98	6.91	113.81%

Species

5.6.29 The habitat enhancement and creation measures described above (delivered via the EMP and SLS) will offset any impacts of habitat loss on the important species and species groups present within the Application Site.

5.6.30 Additional species-specific measures to minimise post-development effects and provide enhanced opportunities for species breeding and refuge are detailed below.

Birds

- Bird nesting features (e.g. swallow/swift ledges and sparrow terraces) will be incorporated into selected new buildings within the residential development; and
- A barn owl box will be erected in the ERZ as detailed in the EMP.

Bats

- Bat roosting features (e.g. bricks and access tiles) will be incorporated into selected new buildings along the eastern boundary of the western development area and the northern boundary of the eastern development area (i.e. fronting on open space and suitable foraging habitat);

- Bat boxes will be installed within mature trees within the ERZ, as detailed in the EMP, to provide further new roosting opportunities; and

- Sensitive design of streetlighting to avoid impacts on bats where in close proximity to retained habitats.

Amphibians and Reptiles

- Construction of hibernacula and log/brash piles in the ERZ as detailed in the EMP.

White-letter hairstreak

- Elm trees (butterfly foodplant), of a variety resistant Dutch elm disease, will be planted in sunny sheltered locations to be specified within the SLS, and incorporated in the new hedgerow planting.

5.7 RESIDUAL EFFECTS

Construction stage

5.7.1 Subject to the mitigation measures outlined above, residual effects anticipated upon IEFs during the construction phase have been reduced to levels that are not considered to be significant.

5.7.2 The only exception to this is the rare arable weed flora associated with the arable farmland to the west of Langford Brook. Where not directly lost to the development, it is unlikely that these species can be retained in the public open space since they rely on annual ploughing/ground disturbance. It is therefore concluded that there will be a residual adverse effect which is significant at a Local level.

Post-completion stage

5.7.3 In light of the mitigation proposed, all potential effects upon those IEFs identified within the assessment are not considered to be significant (aside from the arable weed flora as described above). Furthermore, habitat creation, restoration and long-term management to be delivered via the EMP and SLS (and LMP) will result in minor beneficial (Local level) effects.

Summary of effects

5.7.4 The effects identified are summarised in **Table 5.5** below:

Table 5.5: Summary of effects

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Construction stage					
Statutory designated sites					
Wendlebury Meads and Mansmoor Closes SSSI and Otmoor SSSI	Changes in river flow and flood characteristics	Minor adverse, temporary, reversible, not certain.	Significant (County level)	CEMP (sensitive construction methods, pollution prevention measures)	**Negligible**
	Changes in water quality from on-site pollution				**Negligible**
Non-statutory designated sites					
Ray CTA and Gavray Drive Meadows LWS	Changes in river flow and flood characteristics	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP (sensitive construction methods, pollution prevention measures)	**Negligible**
	Changes in water quality from on-site pollution				**Negligible**
	Damage or deterioration of habitats			CEMP and ECMS (protection of retained habitats); and EMP (enhancement of retained habitat)	**Significant beneficial (Local-level)**
	Disturbance of species				**Negligible**
Habitats and Flora					
Grassland	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP and ECMS (protection of retained habitats); EMP (enhancement of retained habitat); and SLS (new habitat creation)	**Significant beneficial (Local-level)**

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Broadleaved woodland	Direct loss (16%)	Minor adverse, permanent, irreversible, certain	Significant (Local level)	EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP, ECMS and AMS (protection of retained habitats); EMP (enhancement of retained habitat); and SLS (new habitat creation)	**Significant beneficial (Local-level)**
Hedgerows	Direct loss (2%)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP, ECMS and AMS (protection of retained habitats); EMP (enhancement of retained habitat); and SLS (new habitat creation)	**Significant beneficial (Local-level)**
Veteran and mature trees	Direct loss (very small proportion)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP, ECMS and AMS (protection of retained habitats); EMP (enhancement of retained habitat); and SLS (new habitat creation)	**Significant beneficial (Local-level)**
Ponds	Direct loss (10%)	Minor adverse, permanent, irreversible, certain	Significant (Local level)	EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP and ECMS (protection of retained habitats); EMP (enhancement of retained habitat); and SLS (new habitat creation)	**Significant beneficial (Local-level)**
Water course	Direct loss of bank (very small proportion)	Minor adverse, permanent, irreversible, certain	Significant (Local level)	EMP (enhancement of retained habitat)	**Negligible**
	Damage or deterioration	Minor adverse, temporary, reversible, not certain.	Significant (Local level)	CEMP and ECMS (protection of retained habitats); and EMP (enhancement of retained habitat)	**Negligible**
Arable weeds	Direct loss of arable habitat	Minor adverse, permanent, irreversible, certain	Significant (Local level)	N/A	**Significant adverse (Local level)**
Species					

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Wintering bird assemblage	Habitat loss (small proportion)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Disturbance	Insignificant		CEMP and ECMS (protection of retained habitats)	**Negligible**
Breeding bird assemblage	Habitat loss (small proportion)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Direct killing and injuring of nesting birds, young and eggs	Not significant (based on inherent mitigation – legal compliance)		ECMS (sensitive timing and method of vegetation clearance)	**Negligible**
	Disturbance	Insignificant		CEMP and ECMS (protection of retained habitats)	**Negligible**
Barn owl	Loss of potential nesting/roosting habitat (small proportion)	Insignificant		EMP (enhancement of retained habitat, barn owl box)	**Negligible**
Bat assemblage	Loss of potential roosting habitat (very small proportion)	Insignificant		EMP (enhancement of retained habitat, bat boxes)	**Negligible**
	Direct killing and injuring of roosting bats	Not significant (based on inherent mitigation – legal compliance)		ECMS and EPS Licence (sensitive timing and method of tree removal, provision of replacement roost habitat)	**Negligible**

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
	Disturbance of potential roosting habitat	Insignificant		CEMP and ECMS (protection of retained habitats)	**Negligible**
	Loss of foraging habitat (small proportion)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
Otter	Disturbance of foraging habitat	Insignificant		CEMP and ECMS (protection of retained habitats)	**Negligible**
Water vole	Direct loss of bank (very small proportion)	Insignificant		EMP (enhancement of retained habitat)	**Negligible**
	Direct killing and injuring of water voles in burrows	Not significant (based on inherent mitigation – legal compliance)		ECMS (sensitive timing and method of works to bank)	**Negligible**
Badger	Loss of foraging habitat (small proportion)	Insignificant		EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Direct killing and injuring of badgers in setts	Not significant (based on inherent mitigation – legal compliance)		ECMS and NE Licence (sensitive timing and method of works)	**Negligible**
Great crested newts (and other amphibians)	Direct loss of breeding habitat (10%) and terrestrial habitat (small proportion)	Moderate adverse, permanent, irreversible, certain	Significant (Local-County level)	EMP (new pond creation and enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
	Direct killing and injuring	Not significant (based on inherent mitigation – legal compliance)		ECMS and EPS Licence (sensitive timing and method of vegetation clearance)	**Negligible**
	Damage or deterioration of retained habitat	Minor adverse, temporary, reversible, not certain	Significant (Local level)	CEMP and ECMS (protection of retained habitat)	**Negligible**
Reptiles	Direct loss of habitat (<10%)	Moderate adverse, permanent, irreversible, certain	Significant (Local-County level)	EMP (new pond creation and enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Direct killing and injuring	Not significant (based on inherent mitigation – legal compliance)		ECMS (sensitive timing and method of vegetation clearance)	**Negligible**
	Damage or deterioration of retained habitat	Minor adverse, temporary, reversible, not certain	Significant (Local level)	CEMP and ECMS (protection of retained habitat)	**Negligible**
Invertebrate assemblage	Direct loss of habitat (<10%)	Minor adverse, permanent, irreversible, certain	Significant (Local-County level)	EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**
	Damage or deterioration of retained habitat	Minor adverse, temporary, reversible, not certain	Significant (Local level)	CEMP and ECMS (protection of retained habitat)	**Negligible**
Post-completion stage					
Statutory designated sites					

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Wendlebury Meads and Mansmoor Closes SSSI and Otmoor SSSI	Changes in river flow and flood characteristics	Negligible (based on inherent mitigation – surface water drainage system)		Surface water drainage system (SuDS features)	**Negligible**
	Changes in water quality from on-site pollution				**Negligible**
Non-statutory designated sites					
Ray CTA and Gavray Drive Meadows LWS	Changes in river flow and flood characteristics	Negligible (based on inherent mitigation – surface water drainage system)		Surface water drainage system (SuDS features)	**Negligible**
	Changes in water quality from on-site pollution				**Negligible**
	Recreational disturbance	Moderate adverse, permanent, irreversible, not certain	Significant (Local-County level)	EMP (access management) and SLS (alternative open space provision)	**Negligible**
Habitats					
Retained habitats	Hydrological effects	Negligible (based on inherent mitigation – surface water drainage system)		Surface water drainage system (SuDS features)	**Negligible**
	Recreational disturbance	Moderate adverse, permanent, irreversible, not certain	Significant (Local-County level)	EMP (access management) and SLS (alternative open space provision)	**Negligible**
Species					
Wintering and breeding bird assemblage	Disturbance and predation by domestic cats and dogs	Minor adverse, permanent, irreversible, not certain	Significant (Local level)	EMP (enhancement of retained habitat); and SLS (new habitat creation/planting)	**Negligible**

Feature(s)	Potential effect	Nature of effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Barn owl	Collision with vehicles and disturbance of habitat by lighting	Minor adverse, permanent, irreversible, not certain	Significant (Local level)	EMP (enhancement of retained habitat); SLS (new habitat creation/planting) and sensitive lighting design	**Negligible**
Bat assemblage	Collision with vehicles and disturbance of habitat by lighting	Minor adverse, permanent, irreversible, not certain	Significant (Local level)		**Negligible**
Otter and water vole	Hydrological effects on Langford Brook	Negligible (based on inherent mitigation – surface water drainage system)		Surface water drainage system (SuDS features)	**Negligible**
	Disturbance and predation by domestic cats and dogs	Not significant (based on buffering of brook and limited/unproven species presence)		EMP (enhancement of retained habitat); SLS (new habitat creation) and sensitive lighting design	**Negligible**
Badger	Collision with vehicles and disturbance of habitat by lighting and domestic dogs	Not significant (based on limited/unproven species presence)			**Negligible**
Great crested newts (and other amphibians)	Hydrological effects on existing and new ponds	Negligible (based on inherent mitigation – surface water drainage system)		Surface water drainage system (SuDS features)	**Negligible**
	Disturbance and damage of habitats including introduction of fish	Minor adverse, permanent, irreversible, not certain	Significant (Local level)	EMP (access management and habitat maintenance) and SLS (alternative open space provision)	**Negligible**
Reptiles	Disturbance and damage of habitats and predation by domestic cats and dogs	Minor adverse, permanent, irreversible, not certain	Significant (Local level)		**Negligible**
Invertebrate assemblage	Disturbance and damage of habitats	Minor adverse, permanent, irreversible, not certain	Significant (Local-County level)		**Negligible**

5.8 CUMULATIVE EFFECTS

5.8.1 The schemes to be considered in the cumulative assessment include the Proposed Development along with other committed developments (i.e. those that have not been commenced but have a valid planning permission and those schemes which are in the planning process). The assessment of cumulative effects repeats the assessment process set out above, but considers the potential change caused by all schemes identified for cumulative assessment.

5.8.2 Through consultation with the co-ordinating Planning Consultant for this application, the following possible future residential ('Res') and commercial ('Emp') developments have been considered for potential significant cumulative effects (source information from Cherwell District Council's Local Plan Trajectory (2011-2031)):

- Res104: Graven Hill (Bicester 2);
- Res105: Kingsmere SW Bicester Phase 1;
- Res109: North West Bicester (Bicester 1);
- Res110: NWB Phase 2 (Bicester 1)
- Res111: South East Bicester (Bicester 12);
- Res112: South West Bicester Phase 2 (Bicester 3);
- Res117: Cattlemarket;
- Emp101: North West Bicester (Bicester 1);
- Emp102: Graven Hill (Bicester 2);
- Emp103: Bicester Business Park (Bicester 4);
- Emp104: Bicester Gateway Business Park (Bicester 10);
- Emp106: Wretchwick Green (Bicester 12);
- Emp107: South East Bicester (Bicester 12); and
- Emp115: Bicester Gateway (Bicester 3).

5.8.3 In addition to the above, Network Rail's East West Rail scheme to re-establish a rail link between Cambridge and Oxford has also been considered for potential significant cumulative effects. As part of this scheme, the line east from Bicester Village station will be dualled with works required to crossings at Jarvis Lane and Charbridge Lane.

Statutory designated sites

5.8.4 Potential cumulative effects upon Wendlebury Meads and Mansmoor Closes SSSI and Otmoor SSSI relate to additional adverse changes to water quality and flood characteristics due to development activities upstream. Schemes which could potentially affect the relevant water courses (namely Langford/Gagle Brook and the River Ray and its tributaries) include the following:

- East West Rail scheme and Bicester 11 (north of the Application Site);
- Bicester 4, Bicester 10 and Bicester 2 (south of the Application Site); and
- Bicester 12 (east of the Application Site).

5.8.5 However, by virtue of a) avoidance and mitigation associated with the Proposed Development which would reduce any effects to negligible levels; and b) assumed avoidance and mitigation of potential adverse effects for the above schemes to meet planning policy and other legislative/regulatory requirements, no significant cumulative effects are predicted.

Non-statutory designated sites

5.8.6 East West Rail scheme and Bicester 11 could result in downstream hydrological effects on the Langford Brook and associated wetland habitats in the Ray CTA and Gavray Drive Meadows LWS. However, avoidance and mitigation assumed in respect of the SSSIs would also avoid or mitigate effects on the more immediate brook habitats. Therefore, taken together with on-site avoidance and mitigation, no significant cumulative effects are predicted.

5.8.7 Bicester 12 is partly located within the CTA and could potentially result in adverse cumulative effects though habitat loss or recreational disturbance within the CTA (including recreational disturbance within the Application Site). However, Policy Bicester 12 includes the following stipulation: '*The northern section of the site within the Conservation Target Area should be kept free from built development. Development must avoid adversely impacting on the Conservation Target Area and comply with the requirements of Policy ESD11 to secure a net biodiversity gain'*. Therefore, by virtue of a) avoidance and mitigation associated with the Proposed Development which would result in a minor beneficial effect on the CTA; and b) assumed avoidance and mitigation of potential adverse effects associated with Bicester 12 in line with planning policy, no significant cumulative effects are predicted.

5.8.8 Bicester 12 located directly adjacent to the LWS and could potentially result in adverse cumulative effects though habitat damage during construction or recreational disturbance within the LWS (including recreational disturbance within the Application Site). However, the portion of Bicester 12 beside the LWS is also covered by the CTA which is protected from development by planning policy as described above. Therefore, by virtue of a) avoidance and mitigation associated with the Proposed Development which would result in a minor beneficial effect on the CTA; and b) assumed avoidance and mitigation of potential adverse effects associated with Bicester 12 in line with planning policy, no significant cumulative effects are predicted.

Habitats and Species

5.8.9 Potential cumulative effects on habitats and species within or near to the Application Site relate to downstream hydrological effects associated with East West Rail scheme and Bicester 11, and disturbance effects associated with Bicester 12, as described above. For reasons explained above, however, no significant cumulative effects are predicted.

5.8.10 None of the other schemes listed above are predicted to result in any cumulative effects by virtue of their distance from the Application Site and/or separation from the IEFs identified for assessment.