5 BIODIVERSITY

5.1 INTRODUCTION

5.1.1 This Chapter provides an assessment of the potentially significant effects of the Proposed Development (as described in Chapter 1) on biodiversity, and has been prepared by Avian Ecology Ltd.

5.1.2 Baseline information has been compiled from desk study, Extended Phase 1 habitat survey, great crested newt *Triturus cristatus* Habitat Suitability Index (HSI) assessment, great crested newt environmental-DNA (e-DNA) survey, breeding bird and wintering bird surveys. The surveys have been used to provide baseline information to assist in the determination of the likely ecological effects of the Proposed Development.

5.1.3 This assessment establishes the likely presence or absence of protected or notable species, identifies statutory and non-statutory designated sites for nature conservation in the vicinity of the Proposed Development, and evaluates the overall conservation status of the Application Site, located as shown on Figure 5.2.1. The potential for the Proposed Development to have an effect on designated sites, habitats, and protected and notable species is discussed along with proposed mitigation measures where applicable. Opportunities for biodiversity net gain and enhancement are also outlined.

5.2 ASSESSMENT APPROACH

Methodology

5.2.1 This Chapter provides an assessment of the ecological effects of the Proposed Development in the context of wildlife and countryside legislation, and applicable national and local planning policy. The assessment has been undertaken with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018)[1] guidelines for Ecological Impact Assessment and focuses on those activities that could potentially generate significant effects on ecological features. This involves determining the importance of each ecological feature and undertaking an impact assessment pre and post-implementation of mitigation measures. The assessment methodology also reflects the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). The assessment methodology is set out in Appendix 5.1.

5.3 ZONES OF INFLUENCE

5.3.1 Zones of influence or ZOIs (the areas over which ecological features may be affected or require consideration) have been identified in relation to the Proposed Development, with reference to CIEEM (2018) and species-specific best practice guidance. An initial review of ecological features, together with a review of the likely activities associated with the Proposed Development was used to identify zones of influence for the assessment. The desk study and field survey areas were based on these to inform the valuation of ecological features and the selection of important ecological features taken forward for more detailed assessment. Zones of influence vary in accordance with the typical distribution and movements of individual species and the likely mobility of qualifying interests of statutory designated sites. The ZOIs adopted for the Application Site, can be summarised as:

[1] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester

- Desk study - statutory designated sites within 5km of the Application Site, extended to 10km for European Sites (Special Protection Areas (SPAs) or Special Areas of Conservation (SACs) and including Ramsar sites) with mobile qualifying interest species (such as birds and bats);
- Desk study - non-statutory designated sites, protected and notable habitats and species (e.g., Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) Species of Principal Importance and Priority Habitats) within 2km;
- Field survey habitats - land within Application Site and immediately surrounding land (where this could be surveyed from publicly accessible land/with third party permission). The surrounding land was described so as to apply appropriate context and value to habitats identified within the Application Site; and,
- Field survey, badgers, great crested newts and wintering birds– Application Site and adjacent land within at least 30m for badgers, great crested newts and 600m for wintering birds in accordance with current guidance, where access permitted.

Feature Importance

5.3.2 Reference was made to documents listed in the Policy Context section of this document in order to assess the findings of baseline surveys against known assessment criteria. Where uncertainties exist, professional judgment has been used to inform the ecological assessment and this has been highlighted in the text.

5.3.3 In order to determine the baseline conditions present at, and in the vicinity of, the Application Site in relation to species and habitats and to allow determination of important ecological features, a data gathering exercise was initiated as outlined below.

Data Gathering

5.3.4 Information gathered from the desk study and field surveys are detailed in Appendices 5.1 to 5.6.

Desk Study

5.3.5 The following data sources have been used in the compilation of this assessment:

- Leicestershire and Rutland Environmental Records Centre (LRERC) and Lincolnshire Environmental Records Centre (LERC) were contacted to obtain records of protected and priority species, species of local and national conservation concern and non-statutory designated sites of nature conservation interest from within a 2km radius of the Application Site boundary;
- The Multi-Agency Geographic Information for the Countryside ('MAGIC') and Joint Nature Conservation Committee (JNCC) websites to obtain information on statutory sites from within a 5km radius of the Application Site boundary (extended to 10km for European Sites);
- Leicestershire and Rutland Biodiversity Action Plan[2]; and
- Reference was also made to Ordnance Survey maps of the wider area and on-line aerial images (www.google.co.uk/maps) in order to determine any features of nature conservation interest in the surrounding landscape.

[2] https://www.lrwt.org.uk/about-us/caring-wild-places/biodiversity-action-plan [accessed November 2021].

Field Survey Methodologies

5.3.6 Field survey methodologies are provided in Appendices 5.2 to 5.6.

Assessment of Significance

5.3.7 Ecological Impact Assessment (EcIA) is defined within the CIEEM guidelines as:

"*a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems*."

5.3.8 The EIA Regulations requires a description of the 'likely significant effects of the proposed development on the environment' (Regulation 17(3)(b)). The CIEEM guidelines stipulate that it is not necessary to carry out a detailed assessment of impacts upon ecological receptors that are sufficiently widespread, unthreatened and resilient to impacts of the proposed development. As such, the assessment considers effects upon designated sites and ecological receptors which are considered important on the basis of relevant guidance and professional judgement

5.3.9 This Chapter includes:

- An evaluation of identified important ecological features and potential features; faunal species, habitats and vegetation (as appropriate) on an international, national and regional basis;
- A description and evaluation of the potential effects of the Proposed Development on statutory and non-statutory sites designated for nature conservation;
- A description and evaluation of the potential effects of the Proposed Development on species and habitats.
- Mitigation measures to address any identified significant adverse effects;
- Identification of any residual effects after mitigation; and,
- Identification of opportunities for biodiversity enhancements.

Legislation and Policy Framework

5.3.10 Reference has been made to the following key pieces of legislation, planning policy and guidance:

Table 5.1 Legislation and Policy

International
Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 ('the Ramsar Convention) Convention on the Conservation of European Wildlife and Natural Habitats 1979 ('the Bern Convention) UNESCO convention on the protection of the World Cultural and Natural Heritage (1972)
National
Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (which replaces The Conservation of Habitats and Species Regulations

2017 (as amended). For the purposes of this report these two references are interchangeable and hereafter referred to as the 'Habitat Regulations';
The Environment Act 2021;
The Wildlife and Countryside Act 1981 (as amended);
Countryside and Rights of Way Act 2000;
Protection of Badgers Act 1992;
Hedgerow Regulations 1997;
Natural Environment and Rural Communities (NERC) Act (2006); The National Planning Policy Framework (NPPF, 2021)[3]; The Defra Biodiversity Metric 3.0[4]; 'Birds of Conservation Concern 4' (Eaton *et al*., 2015)[5]; The United Kingdom Biodiversity Action Plan (UK BAP); The Bat Conservation Trust - *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Ed.).*[6]; BS 42020:2013 Biodiversity – Code of Practice for Planning and Development; and,
Biodiversity Net Gain. Good practice principles for development[7]
Local
Leicestershire and Rutland Biodiversity Action Plan[8]
Melton Local Plan (2018)[9]

Policy and Guidance

5.3.11 Melton Local Plan 2018 sets out region-wide strategic development policies. Within the Local Plan, Policy EN2; Biodiversity and Geodiversity, includes reference to the protection of features of nature conservation interests, designated sites, protected habitats and species as well as biodiversity requirements.

5.3.12 Leicestershire and Rutland (local) Biodiversity Action Plan (LBAP) sets-out the highest priorities for action to conserve the region's most threatened and declining habitats and species.

5.3.13 Species-specific survey guidance were referred to in the scoping of appropriate survey strategies and to determine the features to be surveyed.

[3] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[4] http://nepubprod.appspot.com/publication/6049804846366720
[5] Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D,. Stroud, D. and Gregory, R (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. British Birds, 108, pp708-746.
[6] Collins *et al.* (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd edition, BCT: London
[7] https://cieem.net/resource/biodiversity-net-gain-good-practice-principles-for-development-a-practical-guide/
[8] https://www.lrwt.org.uk/about-us/caring-wild-places/biodiversity-action-plan [accessed November 2021]
[9] https://www.meltonplan.co.uk/adoptedplan [accessed November 2021]

European Protected Species (EPS) Policies

5.3.14 European Protected Species (EPS), such as bats, great crested newts and otters *Lutra lutra*, receive full protection under The Conservation of Species and Habitats Regulations 2019 (Amendment)(EU Exit). This makes it an offence to:

- deliberately capture, injure or kill any EPS;
- to deliberately disturb them; and,
- to damage or destroy a breeding site or resting place.

5.3.15 In addition, the Wildlife and Countryside Act 1981 (as amended) makes it an offence to intentionally or recklessly disturb a EPS while it is occupying a structure or place which it uses for shelter or protection, or to obstruct access to any structure or place the species uses for shelter or protection.

5.3.16 Natural England is the primary enforcing body of the Habitat Regulations and therefore responsible for implementation and compliance in England. In February 2016 Natural England published '*Wildlife licensing: comment on new policies for European protected species licence'*[10].and in December 2016 Natural England officially introduced the four licensing policies throughout England[11].

5.3.17 The four policies seek to achieve better outcomes for EPS and reduce unnecessary costs, delays and uncertainty that can be inherent in the current standard EPS licensing system. The policies are summarised as follows:

- **Policy 1**; provides greater flexibility in exclusion and relocation activities, where there is investment in habitat provision;
- **Policy 2**; provides greater flexibility in the location of compensatory habitat;
- **Policy 3**; provides greater flexibility on exclusion measures where this will allow EPS to use temporary habitat; and,
- **Policy 4**; provides a reduced survey effort in circumstances where the impacts of development can be confidently predicted.

5.3.18 The four policies have been designed to have a net benefit for EPS by improving populations overall and not just protecting individuals within development sites. Most notably Natural England now recognises that the Habitats Regulations 2019 (Amendment)(EU Exit) legal framework now applies to 'local populations' of EPS and not individuals/site populations.

5.3.19 Where the four policies are considered relevant to the application they are discussed within the corresponding assessment of effects sections for EPS which could potentially occur on or close to the proposed development.

Scoping

5.3.20 The scope of the assessment includes a desk study, an Extended Phase 1 habitat survey, bat preliminary roost assessment, environmental DNA survey for great crested newts, breeding bird and wintering bird surveys. These elements were carried out to establish potential effects on statutory designated and non-statutory designated sites, habitats and protected and priority species.

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10 https://www.gov.uk/government/consultations/wildlife-licensing-comment-on-NEw-policies-for-european-protected-species-licences

11 https://www.gov.uk/government/news/new-licensing-policies-great-for-wildlife-great-for-business

Limitations to the Assessment

5.3.21 Limitations to surveys are outlined within the appropriate appendices (Appendices 5.2 to 5.6). No limitations to the overall objectives of the assessment were encountered.

5.4 BASELINE CONDITIONS

5.4.1 Baseline conditions are outlined in the text below, but are fully described in the following appendices:

- Appendix 5.2: Baseline Habitats and Species;
- Appendix 5.3: Wintering Bird Surveys;
- Appendix 5.4: Breeding Bird Surveys;
- Appendix 5.5: Confidential Badger Survey;
- Appendix 5.6: GCN Presence/ absence eDNA survey.

5.4.2 Baseline information is illustrated in the following Figures, contained within the relevant appendices :

- Figure 5.2.1: Site Location Plan
- Figure 5.2.2: Statutory Designated Sites Plan
- Figure 5.2.3: Non-statutory Designated Sites Plan
- Figure 5.2.4: Phase 1 Habitat Plan
- Figure 5.2.5: Pond Location Plan
- Figure 5.3.1: Site and Wider Wintering Bird Survey Area
- Figure 5.3.2: Wintering Bird Survey Results
- Figure 5.4.1: Breeding Bird Survey Results
- Figure 5.5.1: Confidential Badger Plan
- Figure 5.6.1: Pond Location Plan

5.4.3 Habitats within the Application Site predominantly comprise arable fields; linear features are present including hedgerows with trees, wet and dry ditches. A dirt track runs along the northern boundary of the Site. Four ponds are present within the Site, however three of these were dry at the time of survey.

Statutory and Non-Statutory Designated Sites

Statutory Designated Sites

5.4.4 A review of the MAGIC website confirms that the Application Site does not form part of any statutory or non-statutory designated site for nature conservation. The nearest statutory designated sites are the overlapping Muston Meadows Site of Special Scientific Interest (SSSI) and Muston Meadows National Nature Reserve (NNR), which are located immediately adjacent to the Application Site.

5.4.5 In total, the desk study identified six statutory designated sites within the study area, comprised of five SSSIs, and one NNR. These are detailed in Appendix 5.2 (Table 3.1.1). The locations of all statutory designated sites located within 5km (extended to 10 km for internationally designated sites with mobile qualifying interest species such as birds and bats) of the Application Site boundary are provided in Figure 5.2.2.

Non-Statutory Designated Sites

5.4.6 Data provided by LERC confirms the Application Site does not form part of any non-statutory designated site for nature conservation. Two non-statutory designated sites for nature conservation were located within the study area, these being Grantham Canal and Banks Local Wildlife Site (LWS) located approximately 600m east of the Application Site and Cliff Wood LWS located approximately 1.1km east.

5.4.7 These LWS are considered unlikely to receive hydrological inputs from the Application Site as all receiving drains flow away from the canal.

5.4.8 Details are provided in Appendix 5.2 (Table 3.1.2) and their locations provided in Figure 5.2.3.

Habitats

Priority and Notable Habitats

5.4.9 Five habitats of Principal Importance (also known as priority habitats) designated under Section 41 of the NERC Act/UK Biodiversity Action Plan and one Leicestershire and Rutland Biodiversity Action Plan (LBAP) habitat were identified within 2km of the Application Site. Two priority and LBAP habitats, hedgerows and ponds, are located within the Application Site, with lowland meadow priority and LBAP habitat located immediately adjacent to the Application Site within Muston Meadows SSSI.

5.4.10 No ancient woodland, or ancient or veteran trees were identified within 500m of the Application Site.

5.4.11 Details are provided in Appendix 5.2 (Table 3.1.2) and their locations provided in Figure 5.2.3.

Habitats on-site

5.4.12 Habitats present within the Application Site are shown in Figure 5.2.4. Specific points of ecological interest are identified and recorded using Target Notes (TNs), presented in Appendix 5.2 (Table 3.3.1).

5.4.13 The dominant habitat type within the Application Site is arable farmland, planted at the time of survey with brassica and wheat crops. Fields had narrow margins of semi-improved grassland and also often had species poor hedgerow boundaries. Several ditches were also present, some of which were holding water at the time of survey.

5.4.14 Four ponds are located within the Application Site, however three of these were dry at the time of survey. A further seven ponds are located within 250m of the Application Site.

Protected and Priority Species

Birds

5.4.15 Bird records within 2km of the Application Site provided by LERC comprised of a suite of species typical of the habitats and region. These included thirty-seven species that are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), priority species listed on the UK Biodiversity Action Plan (UKBAP), species listed as a priority species under Section 41 of the Natural Environment and Rural

Communities (NERC) Act 2006, red or amber listed 'Birds of Conservation Concern'[12] and Leicestershire and Rutland Biodiversity Action Plan Species. One species of note, is barn owl *Tyto alba*, which is renowned as being present within the Belvoir area and this is confirmed with nine records within 5km of the Application Site. No evidence of barn owl was recorded during any of the surveys but suitable habitats are present, which the species may utilise if present.

Wintering Birds

5.4.16 During the wintering bird surveys, no primary 'target' species (defined typically as waterfowl or other species using large open fields in winter that may be displaced due to the Proposed Development) were recorded within the Application Site.

5.4.17 The wintering bird surveys, desk study and evaluation suggest that although they are present in the wider area, the Application Site and surrounding fields are used by very low numbers of any target species and do not provide an important foraging or roosting resource for non-breeding waterfowl.

5.4.18 Full details of the wintering bird surveys are presented in Appendix 5.3

Breeding Birds

5.4.19 Breeding birds within the Application Site comprised species typical of arable farmland habitats. These included seven notable species, defined as species that are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), priority species listed on the UK Biodiversity Action Plan (UKBAP), species listed as a priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006, red or amber listed 'Birds of Conservation Concern' and Leicestershire and Rutland Biodiversity Action Plan Species.

5.4.20 The numbers of birds using the Application Site for breeding was generally considered low, usually with four or fewer territories, however numbers of skylark *Alauda arvensis* and yellowhammer *Emberiza citrinella* were considered moderate, with seven and 11 territories, respectively. The notable Species breeding assemblage (which included dunnock *Prunella modularis*, reed bunting *Emberiza schoeniclus*, linnet *Linaria cannabina* and yellowhammer) was typically associated with vegetation along field boundary habitats such as hedgerows. Ground nesting species consisted of quail *Citurnix coturnix*, grey partridge *Perdix perdix* and skylark.

5.4.21 Full details of the breeding bird surveys are presented in Appendix 5.4.

Bats

5.4.22 The data search returned 162 bat records of eight bat species, namely brown long-eared *Plecotus auratus* (20 records), Natterer's *Myotis nattereri* (1), Daubenton's *Myotis daubentonii* (2), noctule *Nyctalus noctula* (8), common pipistrelle *Pipistrellus pipistrellus* (51) soprano pipistrelle *Pipistrellus pygmaeus* (28), barbastelle *Barbastella barbastellus* (1) and a further 50 records not assigned to species level.

5.4.23 Results from a search of MAGIC show one EPS licences (2015-1548-EPS-BDX) in relation to bats within 2km, granted in 2015 for a roost of soprano pipistrelle, located approximately 1.2km north of the Application Site.

[12] MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD. (2015). *Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man*. British Birds 108, 708–746

Roosting Bats

5.4.24 Three trees within the Application Site were noted as having suitable bat roosting features, two of which were assigned moderate bat roosting potential (BRP) in line with the criteria set out in the Bat Conservation Trust guidelines[13] and one of which was assigned high BRP. These trees are shown as TN2, TN5 and TN7 on Figure 5.2.4. All other trees within the Application Site were assigned negligible or low BRP. No structures were located within the Application Site.

Foraging and Commuting Bats

5.4.25 Habitats within the Application Site were considered to provide moderate suitability foraging and commuting habitat, with continuous habitat connected to the wider landscape that could be used for commuting, and foraging habitats that are well connected to the wider landscape.

5.4.26 Linear features within and around the Site such as hedgerows, dry and wet and ditches are considered to offer the most favourable habitats for foraging / commuting bats as do the ponds (and surrounding habitats) and woodland belts areas present within and immediately adjacent to the Site and present in the wider area.

Badger

5.4.27 Due to its potential use in informing criminal activity, information relating to the presence of badger *Meles meles* setts on this site and the assessment of impacts of the Proposed Development upon badgers have been redacted from this report and are available in a separate Confidential Appendix (Appendix 5.5), the circulation of which is restricted.

Otter

5.4.28 No records of otter within 2km of the Application Site in the last 10 years were returned by LERC.

5.4.29 Drainage ditches within the Application Site were largely dry, however when wet may provide some connectivity to the nearby Grantham Canal and Winter Beck. Due to the ditches being largely dry, this connectivity is considered poor. Arable habitats within the Application Site are unsuitable as terrestrial habitat for otter.

Water Vole

5.4.30 No records of water vole *Arvicola amphibius* within 2km of the Application Site within the last 10 years were returned by LERC.

5.4.31 A flowing stream along the western boundary of the Application Site provides moderate suitability for water vole; however other ditches were either dry or had very shallow water levels at the time of survey and were considered sob-optimal for this species.

Hazel Dormouse

5.4.32 There are no known populations of hazel dormouse *Muscardinus avellanarius* within Leicestershire, or the neighbouring counties of Nottinghamshire and

[13] Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guideline*s. The Bat conservation Trust, London.

Lincolnshire[14], and therefore they are considered unlikely to be present within the Application Site, particularly given the absence of large, well connected woodland blocks in the wider landscape.

5.4.33 Hazel dormouse has therefore been scoped out of further assessment.

Other Mammals

5.4.34 Several brown hare *Lepus europaeus* were observed using the Application Site during the field surveys. In addition, it is considered likely that European hedgehog *Erinaceus europaeus* may also utilise hedgerows and boundary features within the Application Site.

Amphibians

5.4.35 The data search returned no recent records of great crested newt or other amphibian species within 2km of the Application Site and a review of MAGIC showed no EPS licences granted for great crested newt within 2km.

5.4.36 Muston Meadows SSSI, located adjacent to the Application Site, includes great crested newt within its citation, however it is not known when this information was last updated.

5.4.37 There are four ponds within the Application Site (as shown on Figure 5.2.5), however at the time of survey, only P2 was wet. The three ponds located towards the north of the Application Site had clearly been dry for some time. Additionally, there were a further seven ponds located within 250m of the Application Site, however none of these were accessible for survey.

5.4.38 Arable habitats within the Application Site provide largely unsuitable terrestrial habitat for amphibians, however semi-improved margins and hedgerow bases provide areas of more suitable habitat.

5.4.39 eDNA surveys undertaken on P2 in June 2020 returned a negative result, indicating likely absence of the species within this waterbody. Detailed information relating to great crested newt surveys is provided in Appendix 5.6.

Reptiles

5.4.40 No records of reptile within 2km of the Application Site within the last 10 years were returned by LERC.

5.4.41 Arable habitats within the Application Site provide largely unsuitable terrestrial habitat for reptiles, however semi improved margins and hedgerow bases provide areas of more suitable habitat.

White Clawed Crayfish

5.4.42 No watercourses considered suitable to support white clawed crayfish *Austropotamobius pallipes* were located within the Application Site. All ditches within the application site lacked suitable refuge areas, may dry periodically and are not considered well connected to other areas of suitable crayfish habitat.

5.4.43 White clawed crayfish have therefore been scoped out of further assessment.

[14] Webridge, D., Al-Fulaij, N., Langton, S. (2016) *The State of Britains Dormice 2016*. Peoples Trust for Endangered Species.

Invertebrates

5.4.44 No records of notable invertebrate species within 2km of the Application Site were returned by LERC. Habitats within the Application Site are common and widespread, and generally of lower value to invertebrates, and therefore likely to support invertebrates that are also common and widespread.

5.4.45 Due to the absence of recent desk study records and the commonplace habitats within the Application Site notable invertebrates have been scoped-out of further assessment.

Notable Plants

5.4.46 No records of notable plants within 2km of the Application Site were returned by LERC and no notable plants were observed within the Application Site during field surveys. Habitats within the Application Site are common and widespread both locally and nationally, and therefore likely to support a plant assemblage that is also common and widespread on arable farmland.

5.4.47 Due the absence of desk study and field records, as well as the commonplace habitats within the Application Site, notable plants have been scoped out of further assessment.

Invasive Non-native Species

5.4.48 One record of an invasive non-native species, American mink *Neovison vison* was returned by LERC within 2km of the Application Site.

5.4.49 During field surveys, no invasive non-native species were encountered.

Determining Ecological Features to be Included in the Detailed Assessment

5.4.50 The results of the desk study and field surveys were used to inform the identification of important ecological features within the Application Site.

5.4.51 Only those ecological features that it was considered could experience significant effects (e.g. affecting protected or notable habitats and species or biodiversity objectives or the favourable conservation status of a species' population), and which were identified as being of sufficient importance (informed also by professional judgement) to be material to decision making, have been identified for detailed assessment (Appendix 5.1).

5.4.52 For the reasons discussed in the relevant sections above, the following ecological features have been scoped-out of further assessment:

- Hazel dormouse;
- White clawed crayfish;
- Invertebrates; and
- Notable plants

5.4.53 Table 5.2 presents the evaluation of ecological features and provides the rationale as to why individual features have been included or excluded from the detailed assessment.

Table 5.2: Importance of ecological features

Ecological feature	Geographic scale of importance (in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
Statutory designated sites	National	Six statutory designated sites are located in the study area, five of which are SSSI and one of which is a NNR. Two overlapping statutory designated sites are located adjacent to the Application Site; Muston Meadows SSSI and Muston Meadows NNR. **Muston Meadows SSSI and NNR scoped in to the detailed assessment due to the potential for effects on statutory designated sites** **All other sites scoped out of detailed assessment as not designated for mobile species, not hydrologically linked, are considered sufficiently distanced to impacts of construction dust and the Application Site is not considered functionally linked habitat.**
Non-statutory designated sites	County	Two non-statutory designated sites are located within the study area, the nearest being Grantham Canal and Banks LWS located 600m east of the Application Site. **Scoped out of detailed assessment as not hydrologically linked, is considered sufficiently distanced to impacts of construction dust and the Application Site does not suitable habitat for species included in the site citation.**
Priority and Notable Habitats	County	Priority habitats including lowland meadow and deciduous woodland, located outside the Application Site, are an important resource within the counties of Leicestershire and Lincolnshire. **Scoped in to detailed assessment**
Hedgerows and ponds	Local	Hedgerows and ponds within the Application Site constitute priority habitat, however as these habitats are widespread at a local and national level, Hedgerows within the Application Site are species poor while the only wet pond shows signs of eutrophication. **Scoped in to detailed assessment as provides potentially valuable habitat for other**

Ecological feature	Geographic scale of importance (in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
		ecological features
On-site habitats (excluding hedgerows)	Site	Habitats within the Application Site are common and widespread at a local and national level and have a low intrinsic value for nature conservation. **Scoped in to detailed assessment as provide habitat for other ecological features.**
Wintering birds	Site	No 'target' species were observed utilising the Application Site during the wintering bird surveys. The Application Site does not provide an important foraging or roosting resource for non-breeding birds, however may be used by common and widespread species. **Scoped out of detailed assessment as any effect is unlikely to be significant.**
Breeding birds	Local	Breeding species were typical of arable habitats and comprised common and widespread species, however these do include species of conservation concern. **Scoped in to the detailed assessment**
Roosting bats	Regional	Roosting bats have been valued according to Wray *et al* (2010)[15]. Trees within the Application Site have high suitability roosting features and desk study indicated 'rarer' tree roosting species (e.g. noctule) are present within the study area. **Scoped in to the detailed assessment**
Foraging and commuting bats	County	Foraging and commuting bats have been valued according to Wray *et al* (2010). Habitats within the Application Site provide moderate to good foraging and commuting habitat for common and rarer species of bats, scoring between 21-30 points. **Scoped in to the detailed assessment**

[15] Wray, S. e*t al* (2010) Valuing Bats in Ecological Impact Assessment. InPractice vol 70., CIEEM, Winchester. Available at: https://cieem.net/wp-content/uploads/2019/01/InPractice70.pdf (accessed 08/11/2021)

Ecological feature	Geographic scale of importance (in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
Badger	Local	Badger are a common and widespread species both locally and nationally and are protected primarily due to persecution and welfare. **Considered with regards to legal duties only and standard good practice embedded mitigation measures..**
Otter	Local	Despite past declines otter are now a common and widespread species, present on most major inland waterways. Habitats within the Application Site are suitable for occasional commuting only. **Scoped out of the detailed assessment as any effect is unlikely to be significant. Considered in relation to standard good practice embedded mitigation measures.**
Water vole	County	Assumed present on a precautionary basis. Although relatively widespread Water vole are declining across the UK and classified as endangered on the Red List for Britain's Mammals. The species is also included in the Leicestershire Biodiversity Action Plan. **Scoped out of the detailed assessment as any effect is considered unlikely to be significant due to embedded avoidance of impacts to suitable ditches. Considered in relation to standard good practice embedded mitigation measures.**
Amphibians	Local	Although legally protected the species likely present within the Application Site are common and widespread across much of the UK and within Leicestershire. **Scoped in to the detailed assessment**
Reptiles	Local	Although legally protected the species within the Application Site are likely to be common and widespread across much of the UK and within Leicestershire. **Scoped in to the detailed assessment**
Other Mammals	Local	Hedgehog is a declining species classified as

Ecological feature	Geographic scale of importance (in relation to Site)	Potential Effect Pathways and Rationale for selection of Features for Detailed Assessment
(Brown hare and hedgehog)		vulnerable on the Red List for Britain's Mammals. Brown hare have suffered declines due to modern intensive agriculture and are a priority species. **Scoped out of the detailed assessment as any effects considered unlikely to be significant due to embedded avoidance of suitable hedgerows**
Invasive non-native species	N/A	No invasive species were recorded within the Application Site boundaries during survey **Considered with regards to legal duties and standard good practice embedded measures only**

5.5 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

5.5.1 The potential effects of the Proposed Development through the construction, operational and decommissioning phases are discussed below in relation to the ecological features identified in Table 5.2 and included for detailed assessment. Effects are initially assessed in the absence of mitigation, with residual effects presented thereafter. Embedded design measures considered a standard element of the development are taken into consideration as part of the assessment. Where significant effects are identified, or where measures are necessary for ensuring legislative compliance, these are identified. This assessment is based upon Figure 1.4: Layout Plan which details the proposed solar array layout and associated infrastructure within the Application Site.

Future Baseline

5.5.2 In the absence of the Proposed Development, the land within the Application Site is considered to remain dominated by agricultural management practices and crop rotation, with existing features likely to remain in situ. No other changes in the future baseline are anticipated.

Construction Phase Effects

5.5.3 Potential construction phase ecological effects associated with the Proposed Development are considered to relate to:

- Direct land take (habitat loss) to accommodate the Proposed Development;
- Temporary disturbance and land take for construction, laydown areas and construction compounds (land restored thereafter);
- Disturbance to, fragmentation or severance of connecting habitat or potential commuting routes within and adjacent to the Application Site;

- Disturbance and pollution (indirect effects such as noise and vibration, lighting, dust, pollution from surface water run-off) resulting from site clearance and construction, plant and vehicles movements and site workers' activities.

Statutory Designated Sites

5.5.4 Muston Meadows SSSI and Muston Meadows NNR are located immediately adjacent the Application Site. These sites are both designated due to the presence of neutral clay grasslands, including large populations of green winged orchids.

5.5.5 There will be no direct effects on habitats or species within these sites, as all construction activity will be contained within the Application Site boundaries. The boundary fencing will be constructed first to maintain a minimum 11m stand-off buffer and ensure any subsequent works do not encroach on sensitive habitats associated with the SSSI and NNR.

5.5.6 Installation of the bases for the panels will involve piling which may generate some small quantities of dust, particularly if undertaken in dry weather, and will be located approximately 15m from the SSSI boundary at the closest point. Construction may also involve minor excavation to accommodate cable routes. Any dust generated as a result of piling and excavations is anticipated to be low level and short term, likely for a matter of days in any location.

5.5.7 The implementation of standard good practice pollution prevention and runoff control measures, to include 11m buffers maintained between all works and the boundaries of the SSSI and NNR and implementation of specific protection and avoidance and protection measures (such as dust suppression), will protect against indirect effects, including dust emissions, on nearby designated sites.

5.5.8 It is anticipated that effects from construction of the Proposed Scheme on Muston Meadows SSSI and Muston Meadows NNR will be **negligible** and **Not Significant.**

Priority and Notable Habitats

5.5.9 Six habitats of Principal Importance (also known as priority habitats) under Section 41 of the NERC Act/UK Biodiversity Action Plan were identified within 2km of the Site. Hedgerows and ponds were the only priority habitats found within the Application Site, while lowland meadows were located immediately adjacent the Application Site. A small area of lowland mixed deciduous woodland was located approximately 30m from the Application Site.

5.5.10 As the lowland meadows are a constituent part of the Muston Meadows SSSI and NNR the impacts will be concurrent with those discussed for those receptors above. Impacts on hedgerows are discussed in the relevant section below.

5.5.11 It is considered that the implementation of standard good practice measures, including runoff control and dust suppression (where appropriate) will be appropriate to protect off-site priority habitats from indirect effects resulting from construction of the Proposed Development.

5.5.12 With the exception of hedgerows and ponds, which are discussed below, it is considered that construction of the proposed scheme will have a **negligible** impact on priority and notable habitats which is **Not Significant**.

On-site Habitats

Hedgerows

5.5.13 Hedgerows within the Application Site are intact and species poor, and are a valuable resource helping aid connectivity within the wider landscape.

5.5.14 Approximately 150m of a recently planted hawthorn hedge will be removed, however all other mature hedgerows, totalling approximately 9km, will be retained as part of the proposed layout design, and will be protected during construction in line with BS 5837:2012 *Trees in relation to design, demolition and construction*. It is considered the hedgerow to be removed currently of limited habitat valuable due to it being newly planted, and the length lost is a small proportion (less than 2%) of the overall length of hedgerows within the Application Site.

5.5.15 In the absence of mitigation, construction phase impacts will result in a **minor negative** impact to hedgerows due to the removal of approximately 150m of recently planted hawthorn hedgerow. This is **Not Significant** in the context of the available remaining established hedgerow network.

Ponds

5.5.16 Ponds within the Application Site were largely dry at the time of survey, with the exception of P2 which held some water. P2 showed signs of eutrophication including algal blooms.

5.5.17 Ponds will be protected and retained throughout works, with appropriate buffer zones. It is considered that the implementation of standard good practice measures, including runoff control and dust suppression (where appropriate) will be appropriate to protect both on-site and off-site ponds from indirect effects resulting from construction of the Proposed Development

5.5.18 it is considered that construction of the proposed scheme will have a **negligible** impact on pond habitats which is **Not Significant**.

All Other habitats

5.5.19 Construction of a solar farm generally requires very low levels of direct and permanent land take (typically less than 5% footprint on the ground). The BRE guidance[16], providing guidance as to how the solar industry can support biodiversity, states that, as panels are raised above the ground on posts, approximately 95% of a site used for solar farm development is still accessible for plant growth and complementary agricultural activities, such as conservation grazing.

5.5.20 Field surveys show that the Application Site lies within managed agricultural land of which does not support a species-rich floristic assemblage at any of its field margins and does not share botanical characteristics with neighbouring high value designated sites.

5.5.21 In the absence of mitigation, construction phase impacts will result in a **minor negative** impact to arable/other habitats due to the largely temporary loss and disturbance of low value habitats, which is **Not Significant**.

Breeding Birds

[16] https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf

5.5.22 Birds observed during the field surveys were of common and widespread species, however did include some species of conservation concern including dunnock, skylark, yellowhammer and linnet.

5.5.23 No evidence of barn owl was recorded during any of the surveys on Site and it is considered that the Proposed Development will not impact breeding barn owl.

5.5.24 Potential impacts to breeding birds as a result of construction are primarily the loss of suitable breeding or foraging habitat and disturbance.

5.5.25 Breeding species are confined mainly to mature hedgerows which will be retained and protected throughout works. It is considered that while there may be some minor and temporary disturbance to individual birds resulting from plant movements and noise generated by construction activities, this would have no discernable impact on local bird populations.

5.5.26 Skylark may be more affected by the construction phase of the Proposed Development due to their ground nesting habits and preference for undisturbed and open spaces in which to nest. Construction of the scheme would result in frequent disturbance to these open areas in which panels are to be installed, likely discouraging skylark from nesting within the Site during construction (if carried-out during the bird breeding season). The number of birds potentially affected is however related to the agricultural management regime at the time construction commences. Overall patterns of ground nesting activity, including breeding bird success (nesting and raising young) is highly dependent on the agricultural land management regime in place over a number of years. Skylarks, for example, need to raise 2-3 broods of young each year in order to maintain their local populations; they will stop nesting if the vegetation becomes too tall or dense to allow them easy access, such as with winter wheat. Most cereals are now sown during the autumn, which means that the crops are too tall and dense to allow skylarks to raise more than one early brood. Skylarks may also attempt to nest in grass silage fields, where frequent or early mowing results in many nests being destroyed or predated.

5.5.27 Habitats present within the Application Site are common and widespread in the local area, and therefore it is considered that suitable alternative nesting habitat is present in the wider area and that the loss of habitats within the Application Site will not significantly impact the local skylark population within the construction period.

5.5.28 If works take place in the bird breeding season, suitable standard good practice measures will be set in place to ensure legal compliance, including pre-construction nest checks prior to vegetation clearance if undertaken in the breeding season, and avoidance of works likely to harm nesting birds or their young, as set out in the Wildlife and Countryside Act 1981 (as amended).

5.5.29 The effects of temporary disturbance, habitat loss and displacement on local breeding bird populations during construction are considered to be (only if construction is within the breeding season) **minor adverse** and short term and **Not Significant** in the context of the availability of similar habitats locally.

Bats

Roosting bats

5.5.30 Three mature trees within the site have features that may be utilized by roosting bats. All other trees have low or negligible bat roosting potential.

5.5.31 All mature trees will be retained and protected in line with BS 5837:2012 *Trees in relation to design, demolition and construction* throughout the duration of works. Any lighting used during construction will be directed away from suitable roosting habitats, including mature trees, following guidance published by the BCT and ILP.

5.5.32 5.5.27 It is therefore considered that the construction of the Proposed Development results in **negligible** potential for impacts, either direct habitat loss or disturbance to any bats potentially roosting within the Application Site.

Foraging and commuting bats

5.5.33 Suitable foraging and commuting habitats within the site are restricted primarily to boundary features such as trees and mature hedgerows which will be retained and protected in line with BS 5837:2012 Trees in relation to design, demolition and construction throughout the duration of works. It is considered that recently planted hedge is unlikely to provide suitable foraging or commuting habitat due to its age.

5.5.34 Any lighting used during construction will be directed away from suitable foraging and commuting habitats following guidance published by the BCT and ILP.

5.5.35 It is therefore considered that the construction of the Proposed Development results in **negligible** potential for impacts, either direct habitat loss or disturbance to any bats utilising the Application Site for foraging and commuting. **Negligible** adverse effects are therefore **Not Significant** as a result.

Badger

5.5.36 The potential for effects on badgers is addressed in the Confidential Appendix 5.5, however in general terms is can be noted that the layout design has been developed to avoid impacts to habitats potentially used by badgers for sett creation, foraging and commuting (such as field margins, hedgerows, woodlands and treelines).

5.5.37 Suitable protection measures for badgers will be set inn place as required to ensure this species is safeguarded in line with legislation, such as physical buffer zone protection and fencing, pre-construction checks, tool box talks, covering of excavations (or provision of a means of escape), and ecological supervision.

Amphibians

5.5.38 The Application site is largely unsuitable for amphibians with suitable habitat restricted only to hedgerow bases and associated field margins. The lack of records of this species within 2km suggests great crested newts are unlikely to be locally present although historic notes on the presence within Muston Meadows. Surveys indicate likely absence of great crested newt within the only wet pond within the Application Site. This, along with the extensive areas of arable land which is sub-optimal for this species, means great crested newt, and other amphibians, are unlikely to be present within the construction areas across the Application Site.

5.5.39 The more suitable habitat, such as hedgerows, will be protected and retained throughout works with an appropriate buffer zone, thereby protecting any amphibians utilising the habitat.

5.5.40 It is therefore considered that construction of the Proposed Development would result in **negligible** impact to amphibians, if locally present, which is **Not Significant**.

Reptiles

5.5.41 The Application Site is largely unsuitable for reptiles with suitable habitat restricted only to hedgerow bases and associated field margins.

5.5.42 Hedgerows will be protected and retained throughout works with an appropriate buffer zone, thereby protecting any reptiles utilising the habitat.

5.5.43 It is therefore considered that construction of the Proposed scheme would result in **negligible** impact to reptiles, if present within the Application Site, which is **Not Significant**.

Operational Phase

5.5.44 Operational effects are those occurring following the construction of the solar park. Some effects may reduce with time and habituation, or remain for the lifetime of the Proposed Development. Solar farms operate with little intervention of disturbance required, limited to occasional (largely daytime) maintenance visits. Land within the boundary fence will be utilised for low input grazing, while a protected buffer area of land within the Application Site but outside the boundary fence will be sown with species rich grassland.

5.5.45 Over time, dirt and dust can accumulate on the glass surface of the modules, reducing its power output. Periodic cleaning of PV modules where required will be require only soft brushes and soft, clean water with a recommended pressure less than 690kPa, typical of most municipal water systems. No chemicals are required for the cleaning process, thereby reducing the potential for ground contamination. The ecological impacts of periodic PV cleaning or other maintenance visits are considered to be **negligible** and **Not Significant** and likely to be less disruptive than ongoing normal farming operations.

5.5.46 There are no significant additional operational effects relating to land take, habitat loss or disturbance other than those already addressed under Construction. Some ground disturbance affecting the created operation-phase grassland areas may result from periodic repairs or maintenance such as retrenching of underground cables or restringing of arrays, however these will be temporary in nature and will include reinstating soils and re-seeding with a suitable species diverse grass and wildflower mix in accordance with Appendix 5.7 Biodiversity Management Plan (BMP). Such short-term and reversible disturbance is assessed to be **negligible** and **Not Significant**.

Statutory Designated Sites

5.5.47 The operation of the Proposed Scheme will involve creation of extensive permanent grassland to replace arable cropping regimes, which will be managed through low input grazing over the lifetime of the Proposed Development. Around the peripheries of the Application Site, areas of species rich grassland will be established. The proposed planting and sowing, along with other biodiversity enhancements, is shown on the Landscape Strategy.

5.5.48 This will result in wide meadow margins and permanent grassland buffers between Muston Meadows SSSI and NNR and the Application Site. The cessation of annual cultivation, cropping and chemical applications with fewer nutrient inputs, will reduce the potential for indirect impacts to Muston Meadows SSSI and NNR as a result of nutrient enrichment from runoff. While it if noted that the SSSI is currently in favorable condition, indicating current agricultural practices are not adversely affecting the designated site, long term (minimum 30 years) of low disturbance, low intensity and pesticide-free management with extensive grassland facilitating habitat connectivity and species dispersal is likely to be beneficial to the SSSI and associated species..

5.5.49 The Landscape Strategy provides new areas of complementary species rich grassland creation on plots adjacent to Muston Meadows SSSI and NNR. which while unlikely to achieve the same condition as the designated areas, will provide valuable supplementary connected habitat and act as buffers around these SSSI boundaries.

5.5.50 Due to the reduced potential for runoff related impacts and increased physical separation from Muston Meadows SSSI and NNR it is considered operation of the Proposed Scheme will have a **minor positive** effect on statutory designated sites.

Priority and Notable Habitats

5.5.51 Any maintenance visits associated with the operation of the Proposed Scheme will not impact on adjacent habitats either directly or indirectly, and therefore there will be no operational effects on habitats over and above those described in the Construction effects section above.

5.5.52 The Landscape Strategy includes the creation of new hedgerows and enhancement of existing hedgerows through gapping up, both of which will be managed under the BMP throughout the operational life of the solar farm, contributing to an overall gain in this priority habitat. In addition, planting adjacent to Muston Meadows SSSI and NNR will complement the lowland meadows priority habitat found there.

5.5.53 It is considered operation of the Proposed Scheme will have a **minor positive** effect over the long-term on priority and notable habitats due to the implementation of the Landscape Strategy and BMP.

On-site Habitats

5.5.54 There will be negligible operational disturbance effects on habitats over and above those described in the Construction effects section above. Habitats within the Site will be enhanced in accordance to the methods detailed within the Landscape Strategy and BMP. Overall the proposals will enhance habitats and their value to a range of species including invertebrates, birds, amphibians and small mammals.

5.5.55 Habitats created and strengthened as part of the Landscape Strategy (part of the embedded design of the Proposed Development), which includes hedgerow, orchards, meadow grassland and tree planting, will result in a **moderate positive** effect on habitats within the Application Site at a local geographic scale (hence **Not Significant**).

Breeding Birds

5.5.56 Hedgerows and trees within the Application Site will be retained and enhanced throughout operation of the Proposed Scheme, continuing to provide suitable nesting and foraging habitat for a range of breeding bird species, including owl species. It is anticipated that more sensitive management of the hedgerows will increase the value to breeding birds. In addition, the proposed landscaping consisting hedgerow planting, tree planting, lightly grazed pasture and species rich grassland will be more beneficial to a range of breeding bird species than the current intensive arable land, providing enhanced foraging and nesting opportunities.

5.5.57 The rows of solar arrays will reduce the amount of large open spaces available within the Application Site, which is likely to result in lessened suitability for breeding skylark. It should be noted that skylark breeding plots, as indicated on the Landscape Strategy, have been incorporated into the design and open spaces large enough for skylark breeding will be available within the Application Site towards the peripheries of the array layout. Long term provision of habitat favourable to a range of bird species is

considered to be beneficial to local bird populations, including birds using the Application Site for breeding and birds from neighbouring land taking advantage of enhanced foraging opportunities, such as barn owl.

5.5.58 RSPB guidance[17] recommends areas of at least 16m^2 as suitable for skylark nesting if positioned away from hedges and woodland in relatively open grassland, and it is noted that the proposed layout of the Application Site (see Figure 1.4) and Landscape Strategy, including the new meadow areas, provides open space and suitable conditions for nesting birds, including skylarks.

5.5.59 It is therefore considered that while the operation of the Proposed Scheme may have an overall **negligible** impact on breeding birds, including skylark with open grassland available for nesting, and with increased foraging opportunities for birds, both where breeding on-Site and those breeding on neighbouring land. Overall the impact on the breeding bird assemblage will be a **minor positive** , due to provision of higher quality undisturbed nesting and foraging habitat within hedgerows and grassland.

Bats

Roosting Bats

5.5.60 Operation of the Proposed Scheme will involve no impacts to trees supporting suitable features for roosting bats. Maintenance visits to the Proposed Development will be infrequent and likely fewer than the current agricultural use of the Application Site, and are therefore considered unlikely to cause significant disturbance.

5.5.61 Therefore it is considered that operation of the Proposed Scheme will have **negligible** impacts on roosting bats which is **Not Significant**.

Foraging and Ccommuting Bats

5.5.62 Operation of the Proposed Scheme will involve no impacts to hedgerows and boundary features providing suitable habitat for foraging and commuting bats. Maintenance visits to the Proposed Development will be infrequent and likely fewer than the current agricultural use of the Application Site, and are therefore considered unlikely to cause significant disturbance.

5.5.63 Foraging opportunities are likely to increase across the operational Site as a result of habitat creation. The proposed habitat creation associated with the solar farm will result in extensive diverse grassland (with associated increases in insect prey resources) across the proposed solar farm will significantly increase foraging opportunities for bats post-development, as arable land is reseeded to create grassland / meadow habitat and as chemical pesticide applications cease with the change in land management. Similarly the network of hedgerows and trees connecting across the Application Site and with suitable bat habitat in the wider landscape will be strengthened through new hedgerow and tree planting.

5.5.64 As a result, operational effects of the Proposed Development once new planting and habitat creation has established are assessed to result in a **minor positive** effects on foraging and commuting bats, with increased availability of insect prey and enhanced foraging and commuting habitat.

Badger

[17] https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/helping-species/skylark/

5.5.65 The operational phase will have no effects on badgers over and above that assessed under Construction. Badgers will be able to move around and fully utilise land underneath the panel array and no permanent lighting of the facility will be required.

5.5.66 Newly created grassland and hedgerows, which form part of the design for the Proposed Development, will provide enhanced and relatively undisturbed habitat for badgers to utilise for foraging and shelter. Free movement for badgers (and other small mammals) into and out of the Application Site will be maintained via gaps or badger gates positioned at suitable intervals at the base of the perimeter fencing.

5.5.67 As a result, operational effects of the Proposed Development on badgers are assessed to be **minor positive**.

Amphibians

5.5.68 During the operational phase there would be no additional habitat loss over and above that assessed and discussed under Construction. There will also be no habitat loss or disturbance affecting neighbouring habitats and any amphibian populations they may support. There will be no operational effects on off-site ponds in the wider area.

5.5.69 New grassland, hedgerows and ponds created in line with the Landscape Strategy will provide enhanced habitats which will be suitable for great crested newts and other amphibian species. Habitats within the Application Site will maintain areas suitable for great crested newts breeding, foraging, overwintering and dispersal. In additionAs a result, operational effects of the Proposed Development once new planting and habitat creation has established are assessed to result in **minor positive** effects.

Reptiles

5.5.70 During the operational phase there would be no additional habitat loss over and above that assessed and discussed under Construction. There will also be no habitat loss or disturbance affecting neighbouring habitats and any reptile populations they may support.

5.5.71 New grassland creation along with hedgerows, tree and orchards planted in line with the Landscape Strategy will provide enhanced habitats once they establish which will be suitable for reptile species if present now or in the future.

5.5.72 As a result, operational effects of the Proposed Development once new planting and habitat creation has established are assessed to result in a **minor positive** effects on reptiles.

Decommissioning

5.5.73 Site baseline conditions are likely to change significantly over the likely 40 years of operation, and prediction of these conditions at this point is considered unreliable in terms of predicting likely future decommissioning effects on biodiversity. However potential impacts from decommissioning are considered to be similar to those already described in relation to the construction phase, namely direct and indirect disturbance, temporary/permanent habitat loss and vegetation removal. Update ecological surveys may therefore be necessary prior to decommissioning in order to record the presence of protected and notable species and habitats and identify potential effects and any necessary protection and mitigation measures in order to comply with planning policy and wildlife legislation applicable at the time.

5.6 BIODIVERSITY NET GAIN

5.6.1 A Biodiversity Impact (Net Gain) Assessment has been undertaken for the Proposed Development. This considers land take, habitat creation and any biodiversity enhancements that will accompany the proposed development, assessed using the Defra Metric Biodiversity Net Gain Calculator (version 3.0)[18], adopting precautionary assumptions in relation to build area, cropping and grassland quality, which nonetheless demonstrates that a clear overall net gain in biodiversity units will accompany the proposed development as summarized below.

5.6.2 This net gain can be achieved through the proposed landscape and planting and habitat creation as set out in the Landscape Strategy, along with long term management as part of the BMP. Further enhancements that cannot be quantified through the Natural England Net Gain assessment Metric include new bat and bird boxes, refuge features, hibernacula and wetland enhancements.

Area Habitats

5.6.3 The Application Site total 103.53ha, the majority of which consists of arable cropland. Small areas of land are broadleaved woodland and tall ruderal habitats, making up 0.21ha and 0.32 ha, respectively. Ponds within the Site make up an additional 0.02ha. Baseline habitats within the Site total 210.22 biodiversity units.

5.6.4 Broadleaf woodland and ponds, totaling 1.84 biodiversity units, will be retained throughout the construction and operation of the scheme, resulting in a total loss of 208.38 biodiversity units.

5.6.5 Habitat creation principally involves the sowing of grassland, of which 76.46ha will be lightly grazed pasture and 24.12ha will be species rich meadow, generating a combined total of 570.87 biodiversity units. Woodland screen planting and pond creation generate a further 1.55 biodiversity units and 0.43 biodiversity units, respectively. Habitat creation therefore generates a total of 572.85 units.

5.6.6 Area derived biodiversity units increase by +364.47 biodiversity units, a significant net gain of +173.38% in habitat units.

Linear Habitats

5.6.7 Linear habitats within the Site total 8.68km, consisting predominantly native hedgerow, some of are associated with ditches. Baseline hedgerow units total 69.60 linear biodiversity units.

5.6.8 A total of 0.15km of recently planted hedgerow will be lost as part of the development, resulting in a loss of 0.60 linear biodiversity units while all other hedgerows will be retained.

5.6.9 The landscape strategy proposes to plant 1.48km of new native species rich hedgerow, generating a total of 11.58 linear biodiversity units.

5.6.10 Linear biodiversity units increase by +10.98 linear biodiversity units, a net gain of +15.78% habitat units.

Discussion

5.6.11 The Scheme results in large net gains of +173.38% for area based units and net gains of +15.78% for linear based units. This is largely down to low value arable habitats being replaced with higher value neutral grassland that will be managed to

[18] http://publications.naturalengland.org.uk/publication/6049804846366720

achieve at least moderate condition. For linear units, the gains are due to hedgerow planting. Full results can be seen within the Biodiversity Metric 3.0 spreadsheet, submitted separately with the application. Headline Results from the assessment are provided below in Table 5.3.

Table 5.3: Summary of Biodiversity Net Gain Results

Belvoir Solar Farm

Headline Results

Return to results menu

On-site baseline	*Habitat units*	210.22
	Hedgerow units	69.60
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	574.69
	Hedgerow units	80.58
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	*Habitat units*	173.38%
	Hedgerow units	15.78%
	River units	0.00%
Off-site baseline	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	364.47
	Hedgerow units	10.98
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	173.38%
	Hedgerow units	15.78%
	River units	0.00%
Trading rules Satisfied?		Yes

5.6.12 The biodiversity net gain assessment has been undertaken in line with current best practice guidance and adheres to the ten good practice principles for development[19].

5.6.13 The landscape and habitat proposals associated with the development will meet trading principles embedded within the metric whereby any habitats are replaced or enhanced by like-for-like habitats of the same distinctiveness, or where possible, better habitats.

5.7 MITIGATION, ENHANCEMENT AND RESIDUAL EFFECTS

5.7.1 The approach to mitigation for the Proposed Development has followed the 'mitigation hierarchy', with priority given to avoidance measures (embedded within the layout design) before considering mitigation or compensation.

[19] https://cieem.net/wp-content/uploads/2019/02/Biodiversity-Net-Gain-Principles.pdf

Mitigation by Design

5.7.2 The project design includes a range of inherent, embedded, elements which avoid or reduce the potential for adverse ecological impacts, including siting the solar array layout and compounds within low value arable habitats, and establishing protective buffers around ponds, retained hedgerows and trees. Embedded mitigation measures have been implemented during the iterative design process. The potential for adverse effects during the construction phase will also be controlled through standard good construction and environmental working practices as outlined in the relevant topic chapters.

5.7.3 Biodiversity protection measures have been included through consideration at the design phase. In summary these comprise:

- Avoidance of higher value habitats and retention of such habitats where they occur on-site such as hedgerows, ditches ponds and trees;
- Retaining and protecting on-site ponds to maintain aquatic habitat for amphibians;
- Maintaining suitable buffers around designated sites and habitats likely to be used by protected species;
- Controlling run-off during construction and operation of the Proposed Development in line with legislative requirements and current good practice guidance to prevent possible indirect pollution effects on habitats (including waterbodies) and associated species;
- Landscape proposals for the Proposed Development have been designed to provide an overall biodiversity gain; in line with BS 42020 – A Code of Practice for Biodiversity in Planning and Development. Landscape proposals ensure that there is no net loss of habitats of ecological value. Habitat creation and management will be undertaken well over the 10% net gain provided for in the Environment Act 2021 will be delivered and managed over the lifetime of the Proposed Development (at least 30 years) in accordance with Appendix 5.7 Biodiversity Management Plan (BMP).
- Hedgerows and trees will be retained and protected during construction and operation in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*; and
- There will be no additional light spill into adjacent habitats maintaining dark corridors along hedgerow and woodland edges. Any lighting design will be in line with Bat Conservation Trust/Institute of Lighting Professionals guidance[20].

5.7.4 Habitat protection buffers will be maintained throughout the construction phase and identified with appropriate fencing and signage along with site team briefings at 'tool box talks'.

5.7.5 No lighting of the construction or operational site is proposed, however if needed for a specific task, no illumination will be permitted to be directed towards boundary features, designated sites or along hedgerows which may be used by foraging or commuting bats.

Additional Mitigation

[20] Guidance Note 8: *Bats and artificial lighting*. Bats and the Built Environment Series ILP 2018. https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/

5.7.6 The following measures will be undertaken in addition to those included by design:

- A suitably qualified and experienced ecologist or Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction and decommissioning activities and through whom appropriate ecological advice will be provided where required.
- The ECoW will be responsible for undertaking and/or co-ordinating checks for protected species before construction and decommissioning activities commence. The ECoW (or appointed 'clerk' on behalf of the ECoW) will also maintain a watching brief as necessary throughout the construction and any future decommissioning phase to ensure compliance with relevant legislation.

5.7.7 A possible effect of construction is the displacement (albeit temporary) of foraging and nesting birds, if works are undertaken in the breeding season. In order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), it is recommended that construction and any associated vegetation removal takes place outside of the bird breeding season (March-August inclusive). If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works will be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the legislation.

5.7.8 Badgers are a highly mobile species and may establish new territories and construct new setts within the Application Site in the intervening period between the planning process and any consented future development. As a precaution to avoid adversely affecting any new setts created on or adjacent to the Application Site, a pre-construction badger survey will be undertaken by a suitably experienced ecologist to inform any additional mitigation measures that may be necessary, including amending the layout or applying to undertake works with a badger licence from Natural Resources Wales.

5.7.9 All habitat enhancement measures and ongoing habitat management to maintain their biodiversity value will be informed by and implemented through the BMP which will cover both construction and operation phase activities.

5.7.10 The landscape planting and habitat creation as shown in P19-2022_10I, along with subsequent management designed to maintain and encourage biodiversity across the Application Site throughout the lifetime of the solar farm, will create greater structural and species diversity than is currently provided, and will provide favourable habitat conditions for a range of species, including amphibians, small mammals and invertebrates.

5.7.11 Table 5.4 summarises how mitigation measures will be delivered as part of the planning process.

Table 5.4: How mitigation measures will be delivered

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By design	By S.106	By condition

Ref	Measure to avoid, reduce or manage any adverse effects and/or to deliver beneficial effects	How measure would be secured		
		By design	**By S.106**	**By condition**
1	Avoidance and protection of higher value habitats within and around the Application Site	**X**		
2	New habitat enhancements /compensation as set out in the Landscape Strategy, Environmental Enhancement Strategy and Biodiversity Management Plan, including meadow habitat, new wetland/scrapes, species-rich native hedgerow creation, tree and orchard planting.	**X**		**X**
3	Pre-construction surveys for protected species (particularly badger) and to inform additional avoidance or mitigation requirements during the construction phase			**X**
4	Production and adherence to a Biodiversity Management Plan, including habitat creation and management proposals.			**X**
5	Appointment of Project Ecologist/ECoW			**X**
6	Provision of wildlife habitats including bat and bird boxes, insect hotels, hibernacula and refugia	**X**		**X**

Residual Effects

5.7.12 With the above measures in place, there will be no significant adverse residual effects on any ecological features as a result of the Proposed Development.

5.7.13 With embedded mitigation in place associated with the design and landscape planting, residual effects range between negligible, or minor beneficial at a local geographic scale and ar Not Significant.

Enhancements

5.7.14 All biodiversity enhancements will be in accordance with the Biodiversity Management Plan, Environmental Enhancements Plan and Landscape Strategy.

5.7.15 Hedgerow (over 1km in total) and tree planting along with the creation of a new orchard will be carried out as part of the proposed development which will also include strengthening gappy sections of hedgerow with native species and planting new

hedgerows. This will provide more species diverse and well-structured hedgerows, of value for wildlife around the Application Site.

5.7.16 The main body of the Application Site is currently arable farmland; this area will be used for the solar panel instillation and extensive areas of more botanically and structurally diverse grassland sward (76.46 in total) will be created within and around the Application Site.

5.7.17 Additional wildlife habitat will be created within suitable habitats throughout the Application Site, these consist of:

- a minimum of seven bird boxes, including two owl boxes erected on mature trees located within the fields and hedgerows within the Site;
- a minimum of ten bat roost boxes mounted on mature trees located within the fields and hedgerows;
- Creation of refugia (log piles) and hibernacula suitable for amphibians, reptiles and other species; and
- Creation of 'insect hotels'.

5.7.18 Areas of species-rich grassland totalling 24.12ha, will be created in large areas of grassland fields margins and smaller 4m wide strips of grassland surrounding the solar compartment fence-lines. These areas will be sown with a suitable species-rich tussock grassland seed mix of regional provenance, and will provide suitable terrestrial habitat for great crested newts and reptiles, as well as benefiting a range of other small mammal, bird and invertebrate species.

5.7.19 New wetland habitat/shallow scrapes will be created to diversify the habitats present which will benefit a range of species including birds, invertebrates and amphibians.

Cumulative effects

5.7.20 Total land take for solar farm developments is typically low (less than 5% footprint on the ground), construction works are low impact with groundworks for a temporary period of time, much of which will be undertaken on land subject to annual minor excavation and regular disturbance through tilling/ploughing and normal agricultural management practices. No significant residual effects will result from the Proposed Development, which will provide long-term benefits to biodiversity.

5.7.21 The Proposed Development is located in a rural area with no developments in proximity considered likely to have a discernible in-combination effect on any ecological features impacted by the Proposed Scheme. Any applications visible through planning portals are of a small scale, consisting primarily of householder applications (e.g. extensions) or erecting of single dwellings. These applications have a small land take, and are sufficiently distanced from the Proposed Scheme to result in no discernible in-combination effects.

5.7.22 Solar developments up to 5km away that are operational, due to be constructed or likely to gain planning consent are considered sufficiently distanced from the site that no cumulative adverse effects are anticipated.

5.7.23 As a result, no cumulative or in-combination effects are anticipated in relation to the Proposed Development. Long-term management of on-Site habitats through the BMP and Environmental Enhancements Plan will deliver net biodiversity gain over the lifetime of the solar farm.

5.8 SUMMARY

Introduction

5.8.1 The assessment compiles information from a desk study, extended Phase 1 habitat survey, great crested newt HSI assessment, great crested newt e-DNA survey, breeding bird surveys and wintering bird surveys; enabling the determination of the likely ecological effects of the Proposed Development

5.8.2 The assessment establishes the likely presence of protected or notable species, identifies statutory designated sites for nature conservation in the vicinity of the Proposed Development, and evaluates the overall conservation status of the Application Site. The potential effects on identified ecological features including designated sites and protected and notable species is assessed in line with current guidance, and appropriate mitigation and enhancement measures are described.

Baseline Conditions

5.8.3 Desk study and habitat and species surveys have been undertaken to establish the presence or potential presence of protected and notable species and inform the assessment.

5.8.4 Statutory and non-statutory designated sites were identified within a 5km radius of the Application Site using the (MAGIC) website, along with the JNCC and Natural England websites. Information was received from LERC of protected and notable species and non-statutory designated sites within 5km of the Application Site boundaries.

5.8.5 The application site does not form part of any statutory designated Site. Six statutory designated sites are located within 5km of the Application Site and two non-statutory Sites are located within 2km of the Application Site, The nearest designated site is Muston Meadows SSSI and NNR located immediately adjacent the Site.

5.8.6 Habitats within the Application Site are predominantly arable farmland with semi-improved grassland margins. Fields were bounded by species poor hedgerows. Two priority habitats, hedgerows and ponds were present within the Application Site with lowland meadows located adjacent the Application Site. Four ponds are present within the Application Site, three of which were try at the time of survey.

5.8.7 No target wintering bird species were observed during the surveys and therefore it is considered the site is not important to wintering birds. The number of breeding bird territories within the site was generally low and of common and widespread species typical of the farmland habitats in the locality.

5.8.8 Three trees within the Application site were assessed as having potential to support roosting bats from ground level, however these will remain unaffected by works. Boundary habitats that are of value to foraging and commuting bats will also be retained throughout works.

5.8.9 The Winter Beck may provide suitable habitat for commuting otter and water vole however will be unaffected by works.

5.8.10 One pond on site was suitable for great crested newt but eDNA surveys returned a negative result for the species. Arable habitats within the Application Site are generally unsuitable for this species, and are similarly unsuitable for common species of reptile.

5.8.11 The retention and enhancement of hedgerow habitat and the creation of grassland including meadow areas will benefit a range of species including birds, bats,

reptiles, amphibians, small mammals and invertebrates. Habitat connectivity will be maintained around the Application Site through the retention and protection of hedgerow boundary features.

Likely Significant Effects

5.8.12 With mitigation measures in place, no significant residual effects are anticipated on statutory or non-statutory designed sites or habitats or on protected or notable species including bats, birds, amphibians or other species.

Mitigation and Enhancement

5.8.13 Mitigation and enhancement measures will include the following:

- a minimum of seven bird boxes, including two owl boxes erected on mature trees located within the fields and hedgerows within the Site;
- bat roost provision will be made through the inclusion of a minimum of ten bat roost boxes on mature trees located within the fields and hedgerows;
- Creation of refugia and hibernacula for amphibians and reptiles along with new wetland habitat; and
- Creation of 'insect hotels' and the installation of beehives, with pollinators benefitting from the opportunities provided across the extensive new grassland and meadow habitats.

Conclusion

5.8.14 With the proposed mitigation and enhancement measures in place, the Proposed Development is not considered to have any residual significant effects on any statutory or non-statutory site designated for nature conservation, nor on habitats or protected and notable species, as summarised in Table 5.5.

Table 5.5: Summary of Effects, Mitigation and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value **	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Construction								
Designated sites	Deposition of dust resulting from construction activities	Indirect, temporary	High	Negligible	United Kingdom	Minor adverse Not Significant	Standard pollution control measures (embedded)	Negligible
Priority and notable habitats	Deposition of dust resulting from construction activities	Indirect, temporary	Medium	Negligible	County	Minor adverse Not Significant	Standard pollution control measures (embedded)	Negligible
Hedgerows	Direct loss of section of of young, species poor hedge	Direct, permanent	Low	Low	Local	Minor adverse Not Significant	Landscape planting, enhancement of existing hedgerows	Minor positive
Ponds	Pollution resulting from construction activities, including dust, runoff and spills.	Indirect, temporary	Low	Negligible	Local	Minor adverse Not Significant	Standard pollution control measures (embedded)	Negligible
Other on-site habitats	Direct loss	Direct, permanent	Negligible	Low	Site	Minor adverse Not Significant	Landscape planting of higher quality habitats	Minor positive
Breeding Birds	Disturbance	Indirect, temporary	Low	Low	Local	Minor adverse Not Significant	Works outside of nesting bird season or pre construction check	Negligible
	Destruction of nests	Direct, permanent						
	Habitat loss	Indirect,					Retention of	

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value **	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
		permanent					hedgerows/ trees	
Roosting bats	Loss of or disturbance to roosts	Permanent/ temporary	Medium	Moderate	Regional	Minor adverse Not Significant	All trees to be retained Sensitive lighting design	Negligible
Foraging and commuting bats	Severance of foraging/ commuting route s	Indirect, permanent	Medium	Low	County	Minor adverse Not Significant	Avoidance – boundary features to be retained and protected Night working to be avoided Lighting design sensitive to bats including directed away from boundary features	Negligible
	Disturbance (e.g. through lighting)	Direct, temporary						
Amphibians	Killing/ injury	Direct, permanent	Medium	Low	Local	Not Significant	Avoidance – no impacts to hedgerows/ margins Reasonable Avoidance Measures implemented Landscape planting to enhance habitats	Negligible
	Habitat loss	Indirect, temporary						
	Fragmentation	Indirect, permanent						
Reptiles	Killing/ injury	Direct, permanent	Low	Low	Local	Not Significant	Avoidance – no impacts to	Negligible

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value **	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
	Habitat loss	Indirect, temporary					hedgerows/ margins Reasonable Avoidance Measures implemented Landscape planting to enhance habitats	
	Fragmentation	Indirect, permanent						
Other mammals	Killing/ injury	Direct, permanent	Low	Low	Local	Minor adverse Not Significant	Avoidance – no impacts to hedgerows/ margins Landscape planting to enhance habitats	Negligible
	Habitat loss	Indirect, temporary						
Operation								
Statutory designated Sites	Cessation of intensive agriculture reducing nutrient runoff	Indirect, permanent	High	Low	National	Minor positive Not Significant	N/A	Minor positive
Priority and notable habitats	Cessation of intensive agriculture reducing nutrient runoff	Indirect, permanent	Medium	Low	County	Minor positive Not Significant	N/A	Minor positive
Hedgerows	Habitat creation/ management	Direct, permanent	Low	Low	Local	Moderate positive Not Significant	Creation of new hedgerow and enhancement of existing hedgerows	Moderate positive

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value **	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
Ponds	Cessation of intensive agriculture reducing nutrient runoff	Indirect, permanent	Low	Low	Local	Minor positive Not Significant	N/A	Minor positive
Other on-site habitats	Habitat creation/ management	Direct, permanent	Low	Moderate	Site	Moderate positive Not Significant	Creation of higher quality grassland and ponds	Moderate positive
Breeding birds	Reduction in ground nesting bird plots	Indirect, permanent	Low	Low	Local	Minor adverse Not Significant	Open areas of grassland suitable for skylark included in layout, higher quality foraging habitat created. Installation of bird boxes Hedgerow creation/ enhancement	Minor positive
	Habitat creation/ management	Indirect, permanent				Moderate positive Not Significant		
Roosting bats	Habitat creation/ management	Indirect permanent	Medium	Low	Regional	Minor positive Not Significant	Installation of bat boxes	Minor positive
Foraging and commuting bats	Habitat creation/ management	Indirect, permanent	Medium	Low	County	Minor positive Not Significant	Hedgerow planting and enhancement High quality grassland foraging habitat created	Minor positive
Amphibians	Habitat creation/	Indirect,	Low	Moderate	Local	Minor positive	New	Minor positive

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value **	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
	management	permanent				Not Significant	wetland/pond, grassland and refugia creation	
Reptiles	Habitat creation/ management	Indirect, permanent	Low	Moderate	Local	Minor positive Not Significant	New wetland/pond, grassland and refugia creation	Minor positive
Other mammals	Habitat creation/ management	Indirect permanent	Low	Moderate	Local	Minor positive Not Significant	Hedgerow planting and enhancement High quality grassland habitat created	Minor positive