



Biodiversity Management Plan

Kingston Solar Farm

03/02/2022



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EXECUTIVE SUMMARY

- 2.1. Objectives have been established to enhance and maintain the biodiversity of lands circa 1.3km south of Gotham and c. 0.75km northwest of East Leake, Nottinghamshire, associated with a proposed 49.9MW solar farm with associated infrastructure (the “Proposed Development”).
- 2.2. The objectives include planting of native trees and species-rich hedgerows to provide a plentiful source of food and shelter for a range of fauna species; developing a species-rich grassland across the site, and installing dormouse, bat and bird boxes, hedgehog houses, herptile hibernacula, invertebrate hotels and bee banks.
- 2.3. Actions have been formulated within this document to enable the objectives to be met and to maximise the Application Site’s potential for supporting wildlife. Species which have been given priority within this management and enhancement plan include barn owl, hedgehog, house sparrow, bees and herptile species.
- 2.4. An extended phase 1 habitat survey of the majority of the Application Site was undertaken on 26th February 2021 whilst the remainder of the site was surveyed on 29th June 2021. As part of the full planning application, an Ecological Assessment (“EcA”) has been conducted to assess the Application Site’s ability to support a range of wildlife both now and during all phases of the Proposed Development. The enhancements and mitigation measures set out in this document have been developed in accordance with the findings of the extended phase 1 habitat survey.
- 2.5. Management recommendations have been made for new and existing habitats. Coupled with the above measures, this will ensure that the Application Site can not only be restored to its current agricultural use upon decommissioning, but will have resulted in **net biodiversity gain**.

INTRODUCTION

Background

- 2.6. Neo Environmental Ltd has been appointed by RES (the “Applicant”) to produce a Biodiversity Management Plan (“BMP”) for a proposed 49.9MW solar farm with associated infrastructure (the “Proposed Development”) on lands circa 1.3km south of Gotham and c. 0.75km northwest of East Leake, Nottinghamshire (the “Application Site”).
- 2.7. Please see **Figure 4 of Volume 2: Planning Application Drawings** for the layout of the Proposed Development.

Development Description

- 2.8. The Proposed Development will consist of the construction of a 49.9MW solar farm with bi-facial solar photovoltaic (PV) panels mounted on metal frames, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, two temporary construction compounds, substation and all ancillary grid infrastructure and associated works.
- 2.9. The Proposed Development will result in the production of clean energy from a renewable energy resource (daylight) and will also involve additional landscaping including hedgerow planting and improved biodiversity management.

Adopted Design Principles

- 2.10. Where possible, measures have been implemented as part of the iterative design process to prevent the various phases of the Proposed Development affecting sensitive ecological features. Ecological measures incorporated into the Proposed Development design include the following:
- A 5m buffer from hedgerows,
 - 2m drainage ditch buffer,
 - Tree buffers,
 - 10m buffer from woodland,
 - 15m buffers from locally designated sites,
 - 10cm gaps at the bottom of security fencing to ensure connectivity for wild mammals (see **Figure 13 of Volume 2: Planning Application Drawings**).

Site Description

- 2.11. The Application Site is located on lands circa 1.3km south of Gotham and c. 0.75km northwest of East Leake, Nottinghamshire; the approximate centre point of which is Grid Reference E453185, N328739. Comprising 16 agricultural fields and additional ancillary areas, the Application Site measures c. 80.65 hectares (ha) in total, with only c. 55.65 hectares accommodating the solar arrays themselves. See **Figure 1 of Volume 2: Planning Application Drawings** for details.
- 2.12. The Proposed Development Site is split into two sections, north and south, by an area of woodland, Leake New Wood. Both sections lie on elevated, gently undulating land ranging between 87 – 96m AOD. The northern section extends across several rectilinear agricultural fields largely contained by existing mixed woodland providing good screening for the wider area. These include Gotham Wood to the north, Cuckoo Bush to the east, Leake New Wood to the south and Crownend Wood to the west. The southern section is also surrounded by pockets of woodland including Oak Wood, Crow Wood and Ash Spinney.
- 2.13. The Application Site is in an area with an existing industrial presence with a telecoms mast located on the southwestern boundary of Field 7, a wood pole line along the boundary between Fields 7 and 8 and within the southern section of Fields 4 and 5 and overhead lines located along the southern boundary of Field 16 and the eastern boundary of Field 15 (See **Figure 3 of Volume 2: Planning Application Drawings** for field numbers).
- 2.14. The surrounding area is semi-rural in nature with the site being surrounded by agricultural fields and woodland in most directions. The area is however punctuated by individual farmsteads and Rushcliffe Golf Club is located on the eastern boundary of Field 15 in the southern section of the site. There are also various industrial brownfield sites within the locality including Charnwood Truck Services located directly southwest of Field 4. Additionally, there is a large-scale power station located beyond the A453, circa 1.58km north of the site.
- 2.15. Recreational routes include a number of Bridleways (BW) which cross or abut the Site providing connectivity to the wider Kingston Estate. These include Gotham BW No. 10, 11 and 12 and West Leake BW's No. 5 and 13. West Leake BW No. 5, also known as the Midshires Way, is also a Long-Distance Walking Association (LDWA) Route bordering the southern boundary of Fields 15 and 16. While there are several field drains throughout the Application Site, it lies entirely within Flood Zone 1, an area described as having a "Low probability" of flooding.
- 2.16. The Application Site will be accessed from Wood Lane, which is an unadopted road. Delivery vehicles will exit the M1 at junction 24, signposted A453 Nottingham (S), onto the A453 and travel in a northeast direction for approximately 4.3km, before taking the exit onto West Leake Lane. This road will be travelled on in a southern direction for approximately 1.5km, before turning left onto Kegworth Road. Vehicles will travel northeast along this road for approximately 1.3km before turning right into Wood Lane.

GUIDANCE

- 2.17. Biodiversity is declining across England; however, recent agri-environment schemes indicate that biodiversity can significantly increase through appropriate land management. Well-designed solar farm developments have the potential to support wildlife and increase biodiversity through appropriate management when located on agricultural land.
- 2.18. Due to the nature of solar farm developments, a large proportion of the site is accessible for plant growth and potential wildlife enhancements. Each solar farm development in the UK requires a Biodiversity Management Plan (“BMP”), the purpose of which is to identify objectives for biodiversity and the means by which these objectives will be achieved. This can include the protection of existing species and habitats and the establishment of new habitats, as well as their maintenance and monitoring.
- 2.19. According to ‘Biodiversity Guidance for Solar Developments’¹ the BMP should:
- *“identify key elements of biodiversity on site, including legally protected species, species and habitats of high conservation value such as those listed on Section 41 of Natural Environmental and Rural Communities (NERC) Act 2006², and designated areas in close proximity to the proposed site;*
 - *identify any potential impacts arising from the site’s development, and outline mitigations to address these;*
 - *detail specific objectives for the site to benefit key elements of biodiversity and the habitat enhancements that are planned to achieve these;*
 - *contribute to biodiversity in the wider landscape and local ecological network by improving connectivity between existing habitats;*
 - *identify species for planting and suitable sources for seed and plants;*
 - *consider wider enhancements such as nesting and roosting boxes;*
 - *summarise a management regime for habitats for the entire life of the site;*
 - *provide a plan for monitoring the site; and [sic] adapting management as appropriate to the findings of this monitoring; and,*
 - *set out how the site will be decommissioned.”*

¹ BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene

² Natural Environmental and Rural Communities Act (NERC) 2006, available at www.legislation.gov.uk

- 2.20. Neo Environmental's BMP has been informed by the extended phase 1 habitat survey that was conducted in February and June 2021.

OBJECTIVE OF THE BIODIVERSITY MANAGEMENT PLAN

- 2.21. The objective of this BMP is to minimise any potential negative impacts arising from the Proposed Development, while increasing the habitat diversity. Through generation of renewable energy, the enhancement of the land within the development boundary will increase the site's capability of supporting wildlife.
- 2.22. This will be achieved by:
- Creating and maintaining a diverse species-rich grassland with a varied sward structure;
 - Creating and maintaining native tree planting and species-rich hedgerows;
 - Creating and maintaining wildlife shelters for Priority and locally important species'
 - Ensuring no net loss of biodiversity from the site as a result of the habitat creation scheme; and
 - Maximising the floral and faunal biodiversity of the created and retained habitats.

CURRENT POLICY

Environment Act 2021

- 2.23. This Act introduced a legally binding target on species abundance for 2030, aiming to reverse declines of key wild species. It creates a requirement for 10% net biodiversity gain as part of development projects, and for a series of Nature Recovery Strategies to cover England. The new Act makes minor amendments to the 1981 Act and 2017 Regulations (see above). It expands measures taken against illegal deforestation, enshrines a legal duty for water companies to reduce adverse impacts from storm overflow discharge, and gives statutory effect to conservation covenants. To assist in the above, it also creates an Office for Environmental Protection.
- 2.24. The Environment Act supersedes the former UK Post-2010 Biodiversity Framework and UK Biodiversity Action Plan (“BAP”). While certain provisions of the Act are only likely to enter force in 2022 and 2023, some are already current. The BMP and Net Gain Assessment at **Technical Appendices 2.2 and 2.3** aim to demonstrate how the Proposed Development will assist in achieving the Act’s net gain targets.
- 2.25. The current BMP aims to demonstrate how the Proposed Development will assist in achieving this target.

The Natural Environment and Rural Communities (NERC) Act 2006

- 2.26. The Natural Environment and Rural Communities (NERC) Act³ places a duty on planning authorities to have due regard for biodiversity and nature conservation during operations, ensuring that biodiversity is a key consideration in the local planning process.
- 2.27. A number of habitats and species of principal importance for the conservation of biodiversity (“Priority species” and “Priority habitats”) in England are listed under Section 41 of the NERC Act. These are taken into account in this BMP where relevant.

National Pollinator Strategy: For Bees and Other Pollinators in England

- 2.28. In 2014, the UK joined a small number of countries in Europe who have developed a strategy to address pollinator decline and protect pollination services. England’s national pollinator strategy⁴ was published in November 2014.

³ Available at: <https://www.legislation.gov.uk/ukpga/2006/16/contents>

⁴ Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794706/national-pollinator-strategy.pdf

2.29. Twenty-one governmental and non-governmental organisations have agreed a shared Plan that identifies 34 actions to make England pollinator-friendly. The Plan identifies voluntary actions for farmers to make agricultural land more pollinator-friendly, such as:

- Sowing nectar and pollen-rich wildflower seed mixtures on fallow land or buffer strips;
- Managing buffer strips through grazing and cutting to help prevent grass domination and further encourage wildflowers; and,
- Management of hedgerows by reducing the frequency of cutting to encourage hedges to produce flowers.

2.30. The enhancements set out within this BMP will create areas of flower-rich habitat and bee banks that will support England's pollinator species, including bees and flies.

Biodiversity Action Plans

2.31. The UK Biodiversity Action Plan ("UKBAP"; 1994)⁵ was organised to fulfil the Rio Convention on Biological Diversity in 1992, to which the UK is a signatory. Lists of national Priority species and habitats were produced with all listed species/habitats having specific action plans, defining the measures required to ensure their conservation.

2.32. While the UKBAP has since been superseded by the Environment Act 2021 (see above), regional and local BAPs have been produced to develop plans for species/ habitats of nature conservation importance at regional and local levels. The Nottinghamshire BAP⁶ contains a list of habitats of conservation concern including, among others:

- Ancient and/or species rich hedgerows,
- Arable fields,
- Cereal field margins,
- Ditches,
- Mixed ash dominated woodland,
- Oak-birch woodland
- Planted coniferous woodland

Several species of conservation concern are also listed. Those most relevant to the habitats within the Application Site and/or the local area in which the Application Site is found include

⁵ Available at <https://data.jncc.gov.uk/data/cb0ef1c9-2325-4d17-9f87-a5c84fe400bd/UKBAP-BiodiversityActionPlan-1994.pdf>

⁶ Available at: <https://nottsbg.org.uk/lbap/lbap-introduction-and-sections-1-to-6/>

great crested newt, skylark, meadow pipit, linnet, stock dove, corn bunting, yellowhammer, reed bunting, kestrel, red kite, house sparrow, grey partridge, dunnock, bullfinch, turtle dove, song thrush, mistle thrush, barn owl, lapwing, marbled white butterfly, common hawkmoth, dragonfly, goat cheese webcap and snakeskin brownie mushrooms, brown hare, hedgehog, dormouse, noctule, Leisler's bat, soprano pipistrelle, otter, black mustard, wild cabbage, rye brome, cornflower, chamomile, Good-King-Henry and corn parsley.

Local Conservation & Biodiversity

Rushcliffe Local Plan

- 2.33. The *Rushcliffe Local Plan Part 1: Core Strategy*⁷ was adopted in December 2014 and is the current Local Plan for the borough in which the Application Site falls. In support of the Core Strategy, development management policies with additional details are set out in the *Local Plan Part 2: Land and Planning Policies*⁸, adopted in October 2019. The relevant policies set out within the Plan include the following ecological provisions.

Core Strategy Policy 16: Green Infrastructure, Landscape, Parks and Open Spaces

- 2.34. **Policy 16** stresses the importance of green infrastructure and open space in the borough. Among other points, it notes that developments will only be approved where “*existing and potential Green Infrastructure corridors and assets are protected and enhanced*”.

Core Strategy Policy 17: Biodiversity

- 2.35. Policy 17 has been put in place to achieve biodiversity net gain over the Core Strategy period. The Council aim to do this by:

a) protecting, restoring, expanding and enhancing existing areas of biodiversity interest, including areas and networks of priority habitats and species listed in the UK and Nottinghamshire Local Biodiversity Action Plans;

b) ensuring that fragmentation of the Green Infrastructure network is avoided wherever possible and improvements to the network benefit biodiversity, including at a landscape scale, through the incorporation of existing habitats and the creation of new habitats;

c) seeking to ensure new development provides new biodiversity features, and improves existing biodiversity features wherever appropriate;

d) supporting the need for the appropriate management and maintenance of existing and created habitats through the use of planning conditions, planning obligations and management agreements; and

⁷ [9 Local Plan Part 1 Rushcliffe Core Strategy.pdf](#)

⁸ [Rushcliffe LP Part 2 Adoption version.pdf](#)

e) ensuring that where harm to biodiversity is unavoidable, and it has been demonstrated that no alternative sites or scheme designs are suitable, development should as a minimum firstly mitigate and if not possible compensate at a level equivalent to the biodiversity value of the habitat lost.”

2.36. The policy also stipulates:

“Designated national and local sites of biological [...] importance for nature conservation will be protected in line with the established national hierarchy of designations and the designation of further protected sites will be pursued.”

“Development on or affecting other, non-designated sites or wildlife corridors with biodiversity value will only be permitted where it can be demonstrated that there is an overriding need for the development and that adequate mitigation measures are put in place.”

Local Plan Part 2 Policy 16: Renewable Energy

2.37. This policy states that *“Proposals for renewable energy schemes will be granted planning permission where they are acceptable in terms of [various areas including]:*

c) ecology and biodiversity”.

Local Plan Part 2 Policy 21: Green Belt

2.38. Policy 21 simply states: *“Applications for development in the Green Belt will be determined in accordance with the National Planning Policy Framework.”*

2.39. As Paragraph 140 of the National Planning Policy Framework (NPPF) 2019 notes: *“Green Belt boundaries should only be altered where exceptional circumstances are fully evidenced and justified”.* During consultation, the Council have made it clear that justification for the Proposed Development should cover the avoidance of adverse effects on ecological assets.

Local Plan Part 2 Policy 34: Green Infrastructure and Open Space Assets

2.40. Policy 34 states:

“Where a proposal would result in the loss of Green Infrastructure which is needed or will be needed in the future, this loss should be replaced by equivalent or better provision in terms of its usefulness, attractiveness, quantity and quality in a suitable location. Replacement Green Infrastructure should, where possible, improve the performance of the network and widen its function.”

Local Plan Part 2 Policy 36: Designated Nature Conservation Sites

2.41. This policy covers the criteria for accepting or rejecting proposals that are likely to have a direct or indirect adverse effect on nationally and locally designated sites.

Local Plan Part 2 Policy 37: Trees and Woodlands

- 2.42. This policy covers adverse impacts on mature trees and justified replacement of trees. Provisions include:

“2. Planning permission will not be granted for development which would adversely affect an area of ancient, semi-natural woodland or an ancient or veteran tree, unless the need for, and public benefits of, the development in that location clearly outweigh the loss.

“3. Wherever tree planting would provide the most appropriate net-gains in biodiversity, the planting of additional locally native trees should be included in new developments. To ensure tree planting is resilient to climate change and diseases a wide range of species should be included on each site.”

Local Plan Part 2 Policy 38: Non-Designated Biodiversity Assets and the Wider Ecological Network.

- 2.43. This policy states:

“Where appropriate, all developments will be expected to preserve, restore and re-create priority habitats and the protection and recovery of priority species in order to achieve net gains in biodiversity”.

- 2.44. Policy 38 also specifies design principles for development within Biodiversity Opportunity Areas.

- 2.45. The Application Site is located within Gotham Hills, West Leake and Bunny Ridge Biodiversity Opportunity Focal Area, as identified within the Rushcliffe Biodiversity Opportunity Mapping Report⁹.

- 2.46. Policy 38 of the Local Plan Part 2, discussed above, states that development within these Biodiversity Opportunity Areas should retain and sympathetically incorporate locally valued and important habitats. This includes wildlife corridors and stepping-stones and should be designed in order to minimise disturbance to habitats and species.

- 2.47. Local Plan Part 2 Appendix E specifically identifies woodland and grassland as predominant habitats that should be protected, restored, expanded and enhanced. It states that the existing network of woodland and grassland can be enhanced and buffered. There is also potential for creating important links between existing habitats.

- 2.48. Given the site’s location within this ecological network of wooded and grassland habitats, **any application should provide evidence that the proposal would improve the quantity, quality and connectivity of these habitats.**

⁹Available at: https://nottsbg.org.uk/wp-content/uploads/2021/01/Rushcliffe-BOM-Report-2015_V3.pdf

BASELINE

Designated Sites

- 2.49. The Application Site does not lie within any statutory designated environmental sites.
- 2.50. Within 15km of the Application Site boundary there are no internationally designated sites. There are five Sites of Special Scientific Interest (“SSSIs”) within 5km of the Application Site, namely Rushcliffe Golf Course SSSI (adjacent), Gotham Hill Pasture SSSI, Lockington Marshes SSSI, Attenborough Gravel Pits SSSI and Holme Pit SSSI. There are eight Local Nature Reserves (“LNRs”), but no National Nature Reserves (“NNRs”), within 5km.
- 2.51. The Application Site is directly adjacent to five non-statutory designated environmental sites. Rushcliffe District Golf Course Local Wildlife Site (“LWS”) borders the Application Site along the northeastern boundary of Field 15 (See **Figure 2 of Volume 2: Planning Application Drawings** for field numbers). The Gotham Wood LWS borders the northern boundaries of Fields 1 and 2 and extends east to the Application Site’s access track. The Crownend Wood (Western Assart) LWS borders the southwestern field boundary of Field 7. The West Leake Hills LWS is directly adjacent to the western boundary of Field 12 in the Application Site. In total, 26 non-statutory designated environmental sites (all Local Wildlife Sites (“LWSs”)) are present within 2km of the Application Site.
- 2.52. The only designated sites with connectivity to the Application Site are Rushcliffe Golf Course SSSI, Lockington Marshes SSSI, Attenborough Gravel Pits SSSI, Trent Meadows LNR, Rushcliffe Country Park LNR, Brecks Plantation LNR and Glapton Wood LNR. The non-statutory sites with connectivity to the Application Site include Crownend Wood (Western Assart) LWS, Rushcliffe District Golf Course LWS, Leake New Wood Track LWS and Gotham Wood LWS. **Figures 2.1 and 2.2 of Volume 3, Technical Appendix 2** illustrate these sites. With the implementation of the recommended measures, it has been determined that there will be **no significant adverse effects** on any designated nature conservation site as a result of the Proposed Development.

Habitats

- 2.53. An extended phase 1 habitat survey was undertaken in February and June 2021. The survey covered all land within the Application Site and a 50m buffer around the entire site, together comprising the Ecological Survey Area (“ESA”). This highlighted the presence of the following 18 habitat types within the ESA:
- A1.1.2 Broadleaved Semi-natural Woodland,
 - A1.2.2 Coniferous Plantation Woodland,
 - A2.1 Dense Scrub,

- A3.1 Broadleaved Parkland / Scattered Trees,
- B4 Improved Grassland,
- B5 Marshy Grassland,
- B6 Poor Semi-improved Grassland,
- C3.1 Tall Ruderal,
- J1.1 Arable,
- J1.2 Amenity Grassland,
- J2.1.2 Intact Hedge - Species-poor,
- J2.2.2 Defunct Hedge - Species-poor,
- J2.3.2 Hedge with Trees - Species-poor,
- J2.4 Fence,
- J2.6 Dry Ditch,
- J3.6 Buildings,
- J4 Bare Ground,
- J5 Other Habitat (Garden).

Flora

- 2.54. The majority of the Application Site is dominated by agricultural grassland and arable land of low botanical interest. The extended phase 1 habitat survey did identify one protected flora species in the form of bluebell *Hyacinthoides non-scriptus*. This species is protected under the Wildlife and Countryside Act, 1981¹⁰; therefore, digging up the plant or bulb in the countryside is prohibited.
- 2.55. The bluebells observed during the habitat survey were close to nearby hedgerows and fall within the 5m hedgerow buffer being applied to hedgerows within the Application Site boundary. As such, the bluebells will not be significantly impacted on by the Proposed Development.

¹⁰ Available at: <https://www.legislation.gov.uk/ukpga/1981/69>

Fauna

Badger

- 2.56. No evidence of badger was recorded during the site visit within the ESA. The woodland adjacent to the Application Site provides sett-building habitat for this species, while the hedgerows, arable, improved grassland habitats within the ESA would offer suitable foraging opportunities for the species.

Bats

- 2.57. The hedgerows and ditches within the Application Site as well as the many wooded areas and coniferous and broadleaved woodland plantations adjacent to the site provide foraging and commuting features for bats. These features are largely unlit, being screened from lighting associated with houses, farm buildings or roads. The majority of the site is arable and agricultural grassland, offering more limited foraging interest (generally restricted to the larger British bat species).
- 2.58. The Application Site offers optimal habitats for commuting and foraging bats overall, with good habitat connectivity both within the site and linking it to adjacent areas. Key habitat features include hedges (particularly those containing trees), woodlands and woodland edges.

Other Mammals

- 2.59. The Application Site offers suitable sheltering / foraging habitat for hedgehog in the form of hedgerows, woodland, improved grassland and dense scrub, despite no sign of the species during the habitat survey.
- 2.60. The site also offers suitable arable and grassland habitat for brown hare, with sightings of the species recorded during the Phase 1 Habitat Survey. In addition, roe deer, muntjac deer, common shrew and grey squirrel were recorded during the survey. Field signs of rabbit, European mole and red fox being noted.
- 2.61. Brown hare and hedgehog are UK and Nottinghamshire Priority species¹¹. However, the presence of roe deer, muntjac deer, common shrew, mole, red fox and any other wild common mammals that may use the habitats within the Application Site is considered to be of limited nature conservation interest.
- 2.62. No signs of other protected or Priority mammals were observed. It is expected that the Application Site supports an assemblage of common small mammal species.

¹¹ See <https://hub.jncc.gov.uk/assets/98fb6dab-13ae-470d-884b-7816afce42d4>

Herptiles

- 2.63. The Application Site contains three drainage ditches, and the local area contains three ponds (two to the northeast within 250m of the site and one to the southwest just under 500m from the site) and therefore provides potential suitable habitat for great crested newt (GCN).
- 2.64. Following the phase 1 habitat survey the ditches within the ESA were observed to be agricultural drains and therefore considered unlikely to support GCN. Pond 2 was considered to have poor suitability for supporting GCN. Furthermore, Pond 1 scored an average level of suitability and pond 3 (the furthest away, some 494m southwest of the site) was reported as being a good habitat for GCN. In addition to these nearby ponds, hedgerows, grassland and woodland habitats present within and adjacent to the Application Site all offer suitable terrestrial habitat for multiple herptile species.

Birds

- 2.65. The ESA provides abundant suitable nesting and foraging habitat for a diverse assemblage of birds in the form of hedgerow trees and shrubs, grassland and woodland habitats. This assemblage is likely to include farmland birds of conservation concern. Buildings to the north of the Application Site also offer suitable opportunities for species such as house sparrow, swallow and barn owl.

Invertebrates

- 2.66. The vast majority of the site (improved grassland / arable) is considered to be of very limited value to invertebrates as it is species-poor grassland with high levels of herbicide and fertiliser inputs. However, hedges, tree lines, and areas of semi-natural broadleaved woodland are all considered likely to support a more diverse assemblage. Together with agricultural field drains within the ESA, the site is likely to support a modest assemblage of aquatic invertebrates.

Other Species

- 2.67. No evidence of other protected or Priority species was found within the Application Site.

POTENTIAL IMPACTS

- 2.68. Potential impacts which could arise from the development of a solar farm include:
- Potential habitat loss and fragmentation;
 - Disturbance during construction and decommissioning; and

- Potential contamination of surface waters.

Potential Habitat Loss and Fragmentation

- 2.69. The main impacts during the construction phase include the direct loss of habitat under the Proposed Development footprint, and indirect loss of habitat due to noise and vibration disturbance, and dust and water pollution. The loss of these primarily arable habitat areas is considered to be of negligible significance to nature conservation interest within the local area.
- 2.70. The Proposed Development has been designed in such a way to avoid significant losses of agricultural land during the operational stage, with a total ground disturbance area of 5.33%. Agriculture can continue on the other 94.77% of the land. Circa 175m of hedgerow removal is required for visibility and the creation of a new permissive path.
- 2.71. The main habitat loss will occur under the Proposed Development footprint in regard to structures such as access tracks, cable trenches and hardstanding for buildings and inverters. Solar panels will be mounted on frames which will be pile driven into the ground in a similar way to fence posts, therefore limiting soil disturbance. The Application Site can be fully restored upon termination of its use as a solar farm.
- 2.72. A number of existing habitats will be enhanced, identified local species will be protected, and proposed habitat loss will be compensated for. New habitats will be created using native species appropriate to the Application Site, and biodiversity value will increase. The proposals will limit fragmentation and provide improved connectivity between wildlife habitats. It is therefore considered that habitat loss and fragmentation from the Proposed Development **will not be significant**.

Disturbance During Construction and Decommissioning

- 2.73. The construction and decommissioning phases of a development have the potential to impact upon local wildlife.
- 2.74. To minimise any potential disturbance to wildlife, several measures will be implemented prior to construction and decommissioning work taking place. Avoidance and mitigation measures recommended within the Ecological Assessment (**Technical Appendix 2 of Volume 3**) include:
- Avoidance of hedgerows, woodland, watercourses/field drains, trees, designated sites, and all surface water areas including ponding;
 - Supervision of works between 15m and 30m of ancient woodland by Ecological Clerk of Works (ECoW);
 - Pre-construction badger survey;

- Bat roost assessments for any bat roost potential (“BRP”) trees to be removed;
- Pre-construction bird surveys, if works commence between March and August inclusive;
- Securely covering all excavations at the end of each working day to prevent accidental trapping of badger or other mammals,
- Works affecting GCN habitats to be undertaken using a non-licensed method statement;
- Any vegetation removal from March to September to be carried out directionally towards retained habitat. Careful removal of hedgerow to be performed with hand tools, only when air temperature is above 10°C, and not after long dry spells; ecologist to be contacted if herptiles are found;
- If hedgerow or scrub removal needs to occur between October and February, removal is to be overseen by a suitably qualified and experienced ECoW;
- A 10cm gap between security fence and ground level to permit the movement of wildlife across the local area.

2.75. During the operational phase, the disturbance to local wildlife will be more limited than the levels of disturbance the land is subject to from current farming practice.

2.76. With the creation of new species-rich grassland, native hedgerows and trees, along with the enhancement of existing hedgerows and sensitive management, the site’s potential for supporting local wildlife is anticipated to be increased post-construction. The measures are predicted to result in a **net biodiversity gain** of **44.8%** of area-based habitat and **76.21%** of linear habitat (see **Appendix 2.3 of TA 2: Net Gain Assessment**).

HABITAT CREATION

- 2.77. The existing arable and agricultural groundcover will be replaced by a mix of tussocky grasses and wildflower species. Existing hedgerows will be enhanced, with new hedgerow and tree planting undertaken within the Application Site. These habitats will be in place and managed for the duration of the Proposed Development (circa 40 years).
- 2.78. Various options exist to enhance the biodiversity value of a solar farm site, including the creation of different habitats, such as hedgerows, field margins, wild flower meadows, nectar-rich areas and winter bird crops. Habitat creation planned as part of the Proposed Development is summarised in **Table 2-3** below. Habitats that will be created include:
- Species-rich grassland,
 - Native hedgerows,
 - Native trees,
 - Bat and bird boxes,
 - Hedgehog houses,
 - Hibernacula,
 - Invertebrate hotels and
 - Bee banks (see **Appendix 2.2**).
- 2.79. These habitats individually offer shelter and a food source for supporting a variety of wildlife. The mosaic of these new habitats, combined with the existing hedgerows and ditches, will support the existing wildlife within the Application Site. By offering a wider range of habitats that benefit local wildlife, they also have excellent potential to increase the biodiversity of the site.
- 2.80. The grassland, hedgerows, trees, invertebrate hotels and bee banks will also contribute towards the National Pollinator Strategy, by offering new habitats that will support important pollinator species such as bees and flies.

MANAGEMENT RECOMMENDATIONS

- 2.81. Management recommendations have been made below for new and existing habitats with the aim of achieving the following:
- to maintain and improve species biodiversity within the site;
 - to enhance the quality of the habitats;
 - increase the site's potential for supporting wildlife; and
 - to avoid any potential negative impacts arising from the development of the site.
- 2.82. Recommended management actions required to achieve the desired site conditions are summarised in **Table 2-2** of this document. The table also provides a brief résumé of the rationale for, and possible constraints on, adopting the recommended management.

Responsibilities

- 2.83. It will be the responsibility of the Applicant to ensure that the proposed biodiversity management and monitoring is undertaken. It is expected that suitably qualified and experienced vegetation management contractors, arboriculturists and ecologists will be engaged by the Applicant for this purpose.

Grassland

- 2.84. The planting of species-rich grassland will occur within the Application Site over areas of current arable and improved grassland habitat that will be disturbed during the construction phase. This will primarily be beneath and between the solar PV panels, in all fields where these panels are present. The management regime will ensure a varied sward structure.
- 2.85. Among other wildlife, species-rich grassland is of benefit to invertebrates such as cockchafers. This will in turn encourage foraging by species such as the noctule bat, should this Nottinghamshire Priority bat be present.
- 2.86. It is recommended that soil inversion take place prior to grassland sowing. In addition, given that current grassland species within the red line boundary are dominant, robust and competitive species such as ryegrass and Yorkshire fog, it is recommended that a grass such as yellow rattle be sown first in order to weaken these dominant grass species. Given that there are field signs of mole within the ESA, the species' activity within the soil will already make it more friable and new establishing grassland species should thrive in these conditions.

Soil Stabilisation and Sward Establishment

- 2.87. Prior to sowing, the area of existing grassland will be sprayed with an approved herbicide, with repeat application where necessary to kill off any persistent weeds and regrowth of grasses. Emorsgate EG10 Tussock Grass Mixture or a similar semi-shade mix will be sown to provide a locally appropriate mixture of wildflowers and tussocky grasses, limiting erosion as well as increasing interest to pollinating invertebrates.
- 2.88. Species such as common couch, broad-leaved dock, stinging nettle and creeping thistle can be difficult to eradicate and may cause problems with sward establishment. These species should therefore be monitored when undertaking weed control on site. If required, they may need to be targeted by selective scything before they seed in late summer / autumn.
- 2.89. Low intensity sheep grazing will ensure that areas of shorter sward height will be managed and maintained. In years two and three, grazing will be introduced in the months from August to November inclusive. This limited period will allow the sward to establish, in accordance with Forest Research grassland creation guidance¹².

Grazing Regime

- 2.90. Due to selective grazing habits, sheep grazing can lead to a diverse sward structure, if stocked at correct numbers. Sheep-grazing the grassland areas after construction will benefit local biodiversity by eliminating the requirement for pesticide use as part of the current management regime for crops in the arable field. It will also lead to an increase in the nesting suitability of fields for the Nottinghamshire Priority species, skylark^{13, 14}.
- 2.91. A hardy Midlands breed such as Border Leicester or Leicester Longwool will be used due to their strong sward maintenance, ability to limit scrub dominance and hardiness^{15, 16}. Such breeds are considered suitable for lowland conservation grazing. A grazier will be consulted to specify an appropriate welfare regime, though it is noted that the self-reliance of these breeds will limit the need for welfare checks. All checks that are needed will be performed on foot to minimise disturbance to wildlife.
- 2.92. An appropriate stocking mix (in terms of age and sex) and density will be agreed with the Rare Breeds Survival Trust or a suitably experienced conservation grazier. Stocking density should fall between 0.2 and 0.5 livestock units per hectare per year, as advised by Plantlife¹⁷, with stocking density at the low end of this range for the first three years.

¹² Harris, P *et al.* (2014) Lowland Neutral Grassland: Creation and management in land regeneration.

¹³ RSPB (n.d.) Helping Bird Species: Skylark. Available at: <https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/helping-species/skylark/>

¹⁴ Fuller, R.J. (1996) BTO Research Report No. 164: Relationships Between Grazing and Birds with Particular Reference to Sheep in the British Uplands. British Trust for Ornithology, Thetford.

¹⁵ RBST (n.d.) Border Leicester. Available at: <https://www.rbst.org.uk/border-leicester>

¹⁶ RBST (n.d.) Leicester Longwool. Available at: <https://www.rbst.org.uk/leicester-longwool>

¹⁷ Rehabilitation of existing priority lowland grassland: Timescales to achieve favourable condition. Available at: http://www.magnificentmeadows.org.uk/assets/pdfs/Lowland_grassland_timescales_for_recovery_advisory_note_FINAL-Design.pdf

- 2.93. From the fourth year onwards, grazing will occur between March and November inclusive. Removing grazing over winter will reduce the likelihood of soils becoming poached¹⁸. Sheep will be contained by the security fencing in place during the operational phase. However, they will be allowed to roam freely inside these boundaries to encourage habitat diversity through a more naturalistic grazing process.
- 2.94. In any years that sheep grazing cannot occur, a sit-on mechanical mower and/or manual scything will be used. Cuts down to 50mm will be taken in April, early September (to avoid conflict with nesting birds) and (if necessary) in October. Cuttings will be left onsite for ten days to set seed, before being removed from site.

Hedgerows and Trees

- 2.95. This management plan will enhance the existing hedgerow boundaries by planting new stretches of species-rich hedgerow. Native trees will also be planted (see **Figure 1.14 of Volume 3, Technical Appendix 1: Landscape and Visual Assessment (LVA)**) for additional ecological interest and to strengthen green infrastructure across the site and the nearby designated sites. The hedge and tree planting will include pedunculate oak, alder, goat willow as well as crack willow and aspen in the wetter areas of the Application Site. Infilling of approximately 1828 metres of existing hedgerow will occur with native hedgerow species in order to enhance these habitats further.
- 2.96. Creating hedgerows will benefit a range of local species including Priority Species such as terrestrial mammals and newts. If the correct species are planted and maintained correctly, a hedgerow's potential can be maximised, providing food and shelter throughout the year, as well as connecting existing green infrastructure and wildlife movement corridors.
- 2.97. New and compensatory hedgerow planting has been provided at a ratio of approximately 11:1. Hedgerow loss will total circa 199.5m, with 2239.5m of new hedgerow to be planted.
- 2.98. The hedgerows will be planted as double staggered rows at 6-8 per metre, with a spacing of 300-400mm between rows. They will contain the species proposed in **Table 2-1**. Percentage composition of hedgerow species can be found in **Figure 1.14 of Volume 3, Technical Appendix 1: Landscape and Visual Assessment (LVA)**.

Table 2-1: Hedgerow Species Mix

SCIENTIFIC NAME	ENGLISH NAME
<i>Crataegus monogyna</i>	Common hawthorn
<i>Corylus avellana</i>	Hazel
<i>Prunus padus</i>	Bird cherry
<i>Cornus sanguinea</i>	Dogwood
<i>Acer campestre</i>	Field maple

¹⁸ Harris, P *et al.* (2014) Lowland Neutral Grassland: Creation and management in land regeneration.

- 2.99. It is also important to maintain ground flora along the hedgerows to provide suitable commuting corridors for small mammals and herptiles. This will be achieved by allowing natural colonisation of ground flora from nearby hedgerows. These will be best suited to flourish in the shaded conditions created.
- 2.100. Native tree species will also be planted at field boundaries in the east of the Application Site. These species comprise alder *Alnus glutinosa*, Pedunculate Oak *Quercus robur*, Goat Willow *Salix caprea* as well as Crack Willow *Salix fragilis* and Aspen *Populus tremula* in the wetter areas of the site.

Management Regime

- 2.101. New hedgerows and trees will be planted within the first available planting season (November to March).
- 2.102. In year 2, newly planted hedgerow sections will be pruned (see **Figure 1.14 of Volume 3, Technical Appendix 1: Landscape and Visual Assessment** for further details). Existing hedgerows will be cut on a two- (where hawthorn is present) or three-year cycle, with no more than 1/2 cut in any one year. From year 5, new hedgerows will also enter this cycle.
- 2.103. Newly planted trees will be pruned as needed in years 2 and 3, and as necessary until established. They will then be left to continue their natural development.
- 2.104. For all hedgerows and trees, any pruning or cutting should be done outside of the breeding bird season (which is March to August inclusive) to minimise disturbance to nesting birds. All hedgerow and tree management will be undertaken by a suitably qualified and experienced arboricultural professional.

WILDLIFE SHELTERS

2.105. The creation of wildlife shelters, placed strategically throughout the site, will provide shelter for a range of species.

Bird and Bat Boxes

2.106. Six bird nest boxes will be erected on retained mature trees. These will be a mixture of:

- 2x Schwegler 1B Nest Box with 26mm entrance for very small species,
- 2x Schwegler 1B Nest Box with 32mm entrance (suitable for birds including the Nottinghamshire priority species, house sparrow¹⁹) and
- 2x Barn Owl Nest Box with a 130mm high x 120mm width entrance²⁰

2.107. The Schwegler 1B Nest Boxes will be positioned 2-4m up each tree with a clear flight path to each box entrance. The boxes will be slightly tilted forward so that any driving rain will hit the roof and bounce clear, and will face between north and west, thus avoiding strong sunlight and the harshest winds. Indicative locations are shown in **Figure 1.14 of Volume 3, Technical Appendix 1: Landscape and Visual Assessment**); final locations will be decided during the installation process.

2.108. The Barn Owl Nest Boxes will be positioned at least 3m up a suitable semi-mature/mature tree within the site as the tree needs to be able to support the substantial weight of the box. The positioning of the box and the tree in which it is placed should ensure access to the entrance hole is visible for barn owls that may fly past open landscape. The chosen trees should be isolated or on a woodland edge in a visible area with a suitably elevated canopy and exposed trunk. Again, indicative locations are shown in **Figure 1.14 of Volume 3, Technical Appendix 1: LVA**); final locations will be decided during the installation process.

2.109. Five woodcrete bat boxes will be erected on retained mature trees. These will be a mixture of two of the Schwegler 1FD and three of the 2F-DFP designs (suitable for the Nottinghamshire Priority species soprano pipistrelle (*Pipistrellus pygmaeus*)) or a similar mix if any of these are not available at the time of purchase. The boxes will be positioned 3-5m up the trees with a clear flight path to each box entrance. Boxes will face between southeast and southwest, thus providing natural heating. Indicative locations are shown in **Figure 1.14 of Volume 3, Technical Appendix 1: LVA**; final locations will be decided during the installation process.

¹⁹ See <https://www.nhbs.com/1b-schwegler-nest-box>

²⁰ See <https://www.nhbs.com/barn-owl-nest-box>

Maintenance Regime

- 2.110. All boxes will be maintained for a minimum of five years after installation. Boxes will be checked annually by a suitably competent and qualified ecologist. Where necessary, boxes will be cleaned by removing debris with a clean cloth. Any missing or damaged boxes will be replaced as needed. For boxes where bat roosting is discovered, subsequent checks should be carried out by a licensed bat worker. It is worth noting that barn owls are a Schedule 1 species and so an occupied box must only be disturbed or inspected by a licensed individual.

Hedgehog Houses

- 2.111. Five hedgehog houses and refuge areas will be positioned in the Application Site at quiet corners and habitat edges²¹, especially adjacent to hedgerows.

Maintenance Regime

- 2.112. The hedgehog houses will be checked annually for a minimum of five years after installation. Any missing or damaged houses will be replaced within seven weeks (to allow for sourcing and deployment).

Herptile Hibernacula

- 2.113. Five hibernacula will be constructed within the Application Site, close to other features of potential reptile interest. Each hibernaculum comprises of log, rock and stone piles and is aimed at providing shelter for reptile and amphibians to hibernate. It may also be used by a variety of insects and small mammals. Hibernaculum creation will follow the instructions laid out within **Appendix 2.2A** below.

Management Regime

- 2.114. The hibernacula can be installed at any stage within the first year, and then left to allow natural vegetation colonisation to continue over the subsequent years.

Invertebrate Hotels

- 2.115. Three invertebrate hotels will be erected close to the Application Site margins to provide nesting and sheltering habitat for invertebrates including pollinator species. A number of non-swarming bees, which often adopt these habitats, are Priority species for England.
- 2.116. For optimal warmth, the hotels will be erected in south- or southeast-facing areas not shaded by solar panels (see **Figure 1.14 of Volume 3, Technical Appendix 1: LVA**).

²¹ See <https://www.nhbs.com/hedgehog-house>

Maintenance Regime

2.117. The invertebrate hotels will be checked once each summer for a minimum of five years after installation. Any missing or damaged hotels will be replaced within seven weeks (to allow for sourcing and deployment).

Bee Banks

2.118. Two bee banks will be created in south-facing locations across the Proposed Development. These will consist of mounds of loose sand and similar materials, set aside for mining bee species to burrow into. A number of mining bees are Priority species for England.

2.119. To create warm conditions, these will be constructed in areas not shaded by solar panels. Further details are provided in **Appendix 2.2B**.

Management Regime

2.120. The banks can be created at any stage within the first year, and then left to allow a cycle of vegetation colonisation and natural disturbance to continue over the subsequent years.

Table 2-2: Habitat Creation, Management and Maintenance

Objective	Action Plan Task	Timescale	Notes
Enhance the quality of habitats present	<p><u>Create a diverse grassland with varied structure</u></p> <p>After the development of the solar farm, sections of species-rich grassland seed mix will be sown across the site.</p>	Year 1	<p>Most of the site will be sheep-grazed with a light stocking rate that will allow varied sward structure across the site.</p> <p>Species-rich grassland will support invertebrates, which can encourage foraging by Nottinghamshire Priority bat species.</p>

<p>Create a diversity of habitats within the site</p>	<p><u>New tree planting</u></p> <p>This will include pedunculate oak (<i>Quercus robur</i>), alder (<i>Alnus glutinosa</i>), crack willow (<i>Salix fragilis</i>), goat willow (<i>Salix caprea</i>) and aspen (<i>Populus tremula</i>).</p>	<p>Year 1</p>	<p>Planting will strengthen ecological connections between non-statutory designated sites</p>
	<p><u>Enhance existing hedgerow boundary</u></p> <p>Plant new hedgerows with hawthorn (<i>Crataegus monogyna</i>), elder (<i>Sambucus nigra</i>), dogwood (<i>Cornus sanguinea</i>), hazel (<i>Corylus avellana</i>), wild privet (<i>Ligustrum vulgare</i>), field maple (<i>Acer campestre</i>) and gorse (<i>Ulex europaeus</i>).</p> <p>These corridors will allow the movement of small mammals and herptile species.</p> <p>To ensure a diverse hedgerow with a good structure it is important to maintain ground flora along the hedgerow.</p>		<p>A hedgerow provides shelter and a source of food for a variety of species including birds, small mammals, herptiles and butterflies.</p> <p>If appropriate species are planted and maintained correctly, a hedgerow's potential can be maximised, providing food and shelter throughout the year.</p>

	<u>Install hibernacula</u>		See Appendix 2.2A The hibernacula comprise of log, rock and stone piles, which are aimed at providing shelter for herptile species to hibernate. However, the hibernacula may also be used by a variety of insects and small mammals.
Ensure fencing does not inhibit the movement of wildlife	To allow movement of badgers, brown hares, hedgehogs, small mammals and herptiles across the development area the fence will be above ground level, with at least a 10cm gap at the base, allowing access for these species where required.	Year 1 (during construction phase)	Although badgers will not pass through a 10cm gap, they will dig a depression into the ground at the required areas.
Create a diversity of habitats within the site	<u>Create bat roosting habitat</u> Native tree species will be planted, which, in time, will create new bat roosting resources.	Year 1	The creation of roosting habitat, along with the creation of species-rich habitat that will encourage an abundance of invertebrate life (a potential food source), will be beneficial to local bats.
	<u>Create bird nesting habitat</u> Native tree species will be planted, offering new nesting resources. Low intensity sheep grazing will increase nesting opportunities for skylark.		The creation of nesting habitat, along with the creation of species-rich habitat that will encourage an abundance of invertebrate life (a potential food source) and diverse grassland seed-fall, will be beneficial to local birds including specialist farmland birds.

	<p><u>Create bee banks</u></p> <p>two earth banks will be created across the site to support bees and other invertebrates.</p>		<p>See Appendix 2.2B</p> <p>Banks will be left bare and south-facing for insects such as solitary bees</p>
	<p><u>Install hedgehog houses</u></p> <p>Five hedgehog houses will be positioned across the site to help support this Priority species and provide a refuge area.</p>	Year 1	<p>The creation of species-rich habitat that will encourage an abundance of invertebrate life will also benefit hedgehogs, which feed on insects.</p>
	<p><u>Install invertebrate hotels</u></p>		<p>Features aimed at raising invertebrate numbers and diversity will also benefit insectivorous predators such as bats, birds and herptiles.</p>
Maintain tree planting	<p><u>Tree pruning</u></p>	Years 2 and 3 (longer if needed) between January and February	Management will ensure optimal availability of blossom for wildlife as a potential food source.
Maintain new species-rich ground flora around solar PV installation	<p><u>Low intensity sheep grazing</u></p>	Each year	Low intensity sheep grazing will ensure that the areas of shorter and longer swards will be managed and maintained. This will result in an overall increase in biodiversity within the site.
Maintain hedgerows	<p><u>Cut section of hedgerow</u></p>	Each year between January and February	Cutting on a rotational basis, following standard advice ²² , to ensure the optimal availability of berry and blossom for wildlife throughout the year as a potential food source. Management will also

²² Hedgelink UK, The Complete Hedge Good Management Guide, Available at www.hedgelink.org.uk

			ensure a good base is maintained within the hedgerow to provide suitable habitat for a range of wildlife.
Maintain new wildlife shelters	<u>Check bird and bat boxes, hedgehog houses and invertebrate hotels</u>	Summer of years 1 to 5+	<p>Licensed bat worker required for future checks for all bat roosts discovered.</p> <p>Occupied barn owl boxes must only be disturbed or inspected by a licensed individual.</p> <p>Bird and bat boxes to be cleaned as necessary.</p> <p>All boxes that are missing or are damaged so as not to be functional will be replaced.</p>

GENERAL CONSIDERATIONS

Obligations

2.121. During each of the development phases there are a number of legal obligations that should be considered by all those involved in site work:

- Ensure obligations of the Conservation of Habitats and Species Regulations 2017²³ are met by all involved with the site (see also **Table 2-1** in **Technical Appendix 2: Ecological Assessment (EcA)**).
- Ensure obligations of the Wildlife & Countryside Act 1981 (as amended)²⁴ are met by all involved with the site (see **Technical Appendix 2: EcA** for further detail).
- Ensure all relevant Health & Safety at Work Act obligations²⁵ are met.

Good Ecological Practice

2.122. Whilst management practices should only be altered if there is a good ecological reason for doing so, they should not rigidly be adhered to if they are obviously detrimental to wildlife.

²³ Parliament of the United Kingdom, 2017. The Conservation of Habitats and Species Regulations 2017. Available at <https://www.legislation.gov.uk/uksi/2017/1012/contents/made>

²⁴ Parliament of the United Kingdom, 1981. Wildlife and Countryside Act 1981 (as amended). Available at <http://www.legislation.gov.uk/ukpga/1981/69>

²⁵ Parliament of the United Kingdom, 1974. Health and Safety at Work etc. Act 1974 (as amended). Available at <https://www.legislation.gov.uk/ukpga/1974/37/contents>

INDICATIVE MANAGEMENT SCHEDULE

2.123. Table 2-3 below shows possible months in which activities will occur during habitat establishment and continued management.

Table 2-3: Timeframes for Management Activities

MANAGEMENT ACTIVITY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Year 1 – Initial Habitat Enhancement												
Hedgerow and tree planting	✓	✓								✓	✓	✓
Removal of existing vegetation and seeds beneath solar panels			✓	✓	✓							
Cultivate and allow soil to settle						✓	✓					
Grassland sowing beneath solar panels								✓	✓			
Years 2 and 3 - Annual Habitat Management												
Grazing of grassland beneath solar panels (once sward is established)								✓	✓	✓	✓	
Pruning of newly-planted hedgerow sections and trees	✓	✓							✓			

Checks by contractor through the initial maintenance period to comprise weed clearance, watering and pruning			✓	✓	✓	✓	✓	✓				
Replacement of any dead, dying or diseased newly planted trees or hedgerow										✓	✓	✓
Existing hedgerows cut on a 2- or 3-year cycle, with no more than 1/2 cut in any one year	✓	✓										
Ongoing Annual Management – Year 3 onwards												
Grazing of grassland beneath solar panels			✓	✓	✓	✓	✓	✓	✓	✓	✓	
Ongoing Annual Management – Year 4 onwards												
Light pruning of newly planted hedgerow sections	✓	✓								✓		
Existing hedgerows cut on a 2- or 3-year cycle, depending on species. All	✓	✓										

hedgerows from year 5, with no more than 1/2 cut in any one year.													
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DECOMMISSIONING

- 2.124. At the end of the operational period, decommissioning will take place. This will entail dismantling and removing all of the materials and equipment in order to reinstate the land back to its original condition. Where possible, retaining features such as species-rich grassland and maintaining the hedgerow boundary beyond the 40-year lifespan of the Proposed Development will be of benefit to wildlife. This will enable **net biodiversity gain** (see **Appendix 2.3 of TA 2: Net Gain Assessment**) to be sustained in the long term.

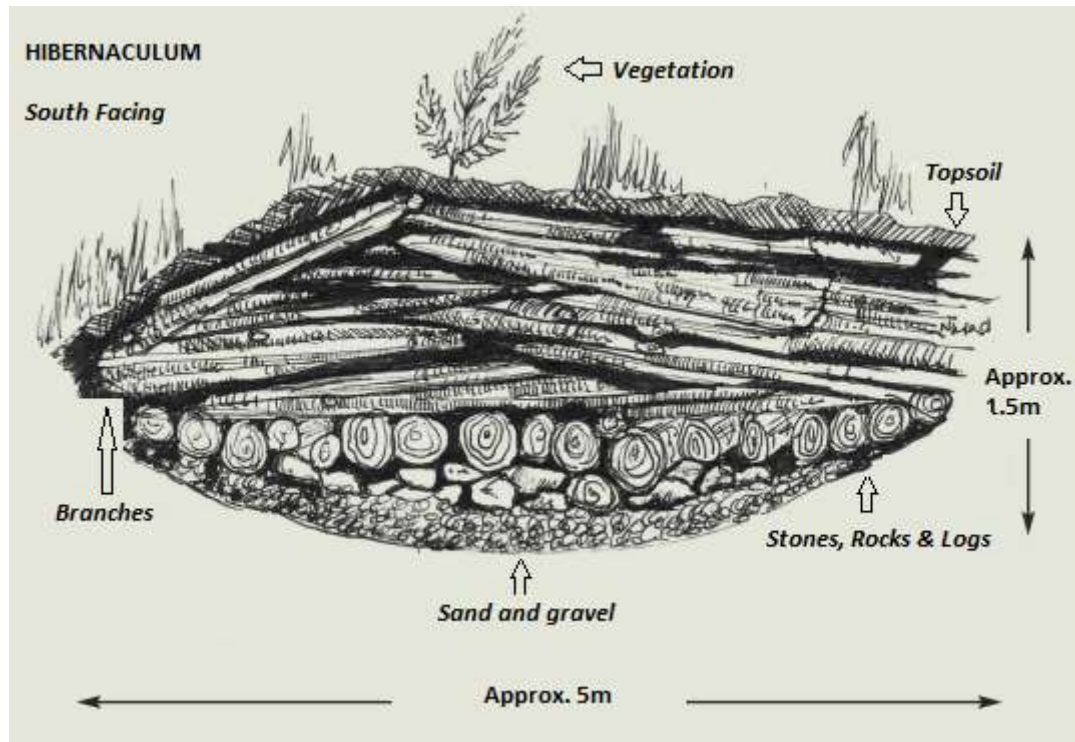
APPENDICES

Appendix 2.2A – Hibernaculum Construction

Appendix 2.2B – Bee Bank Construction

APPENDIX 2.2A - HIBERNACULUM CONSTRUCTION

2.125. The hibernaculum will follow the basic construction set out below, with the log and stone piles situated to the north of the hibernaculum.



- A 5m long east-west running ditch 1m deep and 1m wide will be dug.
- The base will be lined with sand and gravel.
- This will be followed with layers of stones, rocks and logs.
- Smaller branches will then be placed on top, and covered soil from the excavation will be placed over the pile, leaving gaps for access.
- The soil will be shaped into a mound.
- The north-facing side of the mound will be seeded / planted with species that will attract insects and will also provide extra shelter.
- The south-facing side will be maintained with a sparse vegetation cover to provide an area to bask.
- A log pile of approximately 2m by 1m will be placed to the north of the hibernaculum.

APPENDIX 2.2B – BEE BANK CREATION

- Material will be built into a crescent-shaped mound with various slopes, hollows and angles that may be utilised and favoured by different species.
- Aggregate and/or soil will be used to create the core of the bank. Builders' sand will be used to cap the bank in a layer of >30cm deep. Bank faces will then be compacted with the back of a spade.
- Banks will be between 0.5m and 1.5m high. A variety of bank heights will be created to provide habitat microdiversity.
- Vertical faces created on bee banks take much longer to vegetate, and this makes them attractive to many species. Over time a bee bank will be vegetated over through succession.
- Planting appropriate vegetation in an open structure in front of a bee bank will provide extra habitat for invertebrates that are attracted to the bee bank.
- These banks will be created close to flower-rich areas that will create important foraging opportunities for pollinators.