9 BIODIVERSITY

Introduction

9.1 This chapter of the ES sets out the baseline information at the time of writing and considers the likely significant effects of the Development on ecological features during its construction and operational phases.

9.2 The chapter has been prepared by Clarkson & Woods Ltd. in line with Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines and, as required by the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. The assessment is based on the Site and Development Description provided in Chapter 3 of the ES.

9.3 Ecological features that form the basis of the assessment will include:

i. Statutory and non-statutory sites designated for nature conservation at international, national and local levels;

ii. Habitats and species of 'principal importance for the conservation of biodiversity'; and

iii. Other legally protected, red-listed or notable species of conservation interest.

9.4 This chapter will describe the currently available ecological baseline derived from extensive site and desk-based surveys, and assess the possible level of impacts or effects likely to arise, together with any avoidance, mitigation and compensation measures likely to be, or capable of being, adopted to reduce these in accordance with nature conservation legislation and planning policy. Proposals for ecological enhancement to contribute to local conservation priorities and achievement of a Net Benefit for Biodiversity (NBB), and national and local policies are also presented.

9.5 Habitat and species information, referenced in the assessment and presented in this chapter, is based on site surveys conducted in 2023 and 2024, published data, third-party ecological records and web-based information obtained at the time of writing. Any assumptions and limitations relevant to each survey, and how limitations have been overcome, are included within the relevant technical reports (provided in the Appendices to this chapter), and in the assessment set out below.

Appendices and Figures

9.6 This chapter is supported by the following appendices:

i. **Appendix 9.1** Consultation Response Summary

ii. **Appendix 9.2** Preliminary Ecological Appraisal

iii. **Appendix 9.3** Bat Survey Report

iv. **Appendix 9.4** Breeding Bird Survey Report

v. **Appendix 9.5** Overwintering Bird Survey Report

vi. **Appendix 9.6** Otter and Water Vole Survey Report

vii. **Appendix 9.7** CONFIDENTIAL Protected Species Surveys

viii. **Appendix 9.8** Biodiversity Net Gain Report

Policy Context

9.7 Key planning policy relevant to biodiversity and nature conservation which has informed the assessment process includes the following:

National Planning Policy

9.8 The Habitats Directive: Adopted by the European Commission (EC) in 1992, Council Directive 92/43/EEC concerning the conservation of natural habitats and wild flora and fauna was transposed into UK legislation through the Conservation Regulations 1994. This has been superseded by the Conservation of Habitats and Species Regulations 2017. Habitats listed under Annex I to the Directive and species listed under Annex II (including otter and some species of bat) receive special legal protection. This is partly implemented through the creation of a network of protected sites (known through Europe as Natura 2000 network of Site of Community Importance) which, in the UK, is made up of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which are designated under the Birds Directive (Directive 79/409/EEC). Under Regulation 48(1) of the Habitats Directive, all developments with the potential to affect a European Site must undergo an assessment, known as an Appropriate Assessment, to determine the potential to cause harm to the features for which the SAC or SPA was designated.

9.9 Chapter 6 (Distinctive and Natural Places) of Planning Policy Wales[i] details a number of outcomes which planning applications should achieve as detailed below:

- the role which landscapes, the historic environment, habitats and biodiversity, the characteristics of coastal, rural or urban environments play in contributing to Distinctive and Natural places are identified, understood, valued, protected, maintained and enhanced;
- further fragmentation and isolation of habitats and species is avoided, wherever possible, and wildlife corridors and stepping stones forming wider ecological networks are protected, maintained and enhanced;
- sites designated for their landscape or biodiversity or geodiversity importance are fully considered and their special characteristics and features protected and enhanced, whilst the series of sites should be recognised as being at the heart of improving the resilience of ecosystems;
- development proposals are directly shaped by the principle of retaining and enhancing existing habitats and species. This is the most cost effective and robust option for biodiversity, taking into account the benefits of a preventative approach;
- opportunities in all areas to improve the resilience of ecosystems are taken by addressing problems such as, building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources and improving approaches to coastal flood defence in urban areas and coastal margins;
- opportunities to improve health and well-being are taken, in particular, to reduce average levels of airborne pollution, protect appropriate soundscapes, create areas of tranquillity, secure sustainable drainage systems, ensure water sensitive design, address soil carbon management and secure access to informal spaces for recreation through green infrastructure provision so as to improve capacity for adaptability to the challenges of climate change, such as flood risk and increased temperatures;
- opportunities to develop green infrastructure are taken, where this would improve the resilience of ecosystems; and
- support development which contributes positively to an area and addresses environmental risks which constrain potential and impact adversely on communities and the natural and built environment by using PDL or existing buildings and taking opportunities to ‘clean up’ land and address dereliction, where this is informed by the historic and natural environment.

9.10 Under the Biodiversity and Resilience of Ecosystems Duty (Section 6 Duty) (see Appendix A), planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. The Nature Recovery Action Plan supports this legislative requirement to reverse the decline in biodiversity, address the underlying causes of biodiversity loss by putting nature at the heart of decision making and increasing the resilience of ecosystems by taking specific action focused around the 6 objectives for habitats and species.

9.11 Recognising that development needs to take place and some biodiversity may be impacted, the planning system should ensure that overall there is a net benefit for biodiversity and ecosystem resilience, resulting in enhanced wellbeing.

9.12 Development proposals must consider the need to:

- support the maintenance and enhancement of biodiversity and the resilience of ecosystems;
- ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats, including the most recent targets set out in the 2022 UN Global Biodiversity Framework;
- ensure statutory and non-statutory designated sites and habitats are properly protected and managed and their role at the heart of resilient ecological networks is safeguarded;
- safeguard protected species and species of principal importance and existing biodiversity assets from direct, indirect or cumulative negative impacts that affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water, air and soil, including peat; and
- secure the maintenance and enhancement of ecosystem resilience and resilient ecological networks by improving diversity, extent, condition, and connectivity.

9.13 Where negative effects on biodiversity and ecosystem resilience cannot be avoided, minimised or mitigated/restored, and as a last resort compensated for, it will be necessary to refuse planning permission.

9.14 Enhancement must be secured by delivering a biodiversity benefit primarily on Site or immediately adjacent to the site, over and above that required to mitigate or compensate for any negative impact.

9.15 Further legislation and policy documents relevant to the ecology and nature conservation at a national level applicable to this development are:

i. Wildlife and Countryside Act, 1981 (as amended)
ii. Environment (Wales) Act 2016
iii. Protection of Badgers Act, 1992
iv. Countryside and Rights of Way Act (2000)
v. Wild Mammals (Protection) Act, 1996
vi. Future Wales: The National Plan 2040 – Policies 17 and 18
vii. Planning Policy Wales Edition 12, February 2024

Local Planning Policy

9.16 Policy GN.37 within Pembrokeshire County Council's local development plan[ii] relevant to ecology and nature conservation specifies that "*all development should demonstrate a positive approach to maintaining and, wherever possible, enhancing biodiversity. Development that would disturb or otherwise harm protected species or their habitats, or the integrity of other habitats, sites or features of importance*

to wildlife and individual species, will only be permitted in exceptional circumstances where the effects are minimised or mitigated through careful design, work scheduling or other appropriate measures."

9.17 Pembrokeshire Local Biodiversity Action Plan (LBAP)[iii] lists the following priority habitats and species which are, or may be, relevant to the site:

Habitats

- Grassland
- Lowland farmland
- Freshwater
- Woodlands

Species

- Bats (group plan)
- Farmland birds (group plan)
- Reptiles and Amphibians (group plan)
- Invasive non-native species (group plan)
- Otter
- Brown hairstreak
- Southern damselfly
- Kestrel
- Dormouse

Assessment Methodology and Significance Criteria

9.18 The baseline conditions are derived from several desk and field-based studies, the methodologies of which are given separately in Appendices 9.3 to 9.8. The following section describes the method for the assessment of effects of the Development on these baseline conditions. The standard approach applied in the UK to Ecological Impact Assessment (EcIA) is that developed by the CIEEM in 2018 and revised in 2022[iv]. This will be used to evaluate existing conditions, and to assess the significance of likely effects on ecological features that may arise during construction and operation of the Development. This involves determining the relative importance of each ecological feature and undertaking an impact assessment with and without mitigation measures (see Section 9.130 for definitions of 'embedded' and 'additional' mitigation). From this, any residual effects likely to occur can be identified along with an appreciation of their significance.

Assessment of Ecological Importance

9.19 When evaluating the baseline biodiversity importance of natural features found on the Site, the CIEEM Guidelines indicate that the following characteristics are considered:

- Animal or plant species which are rare or uncommon, either internationally, nationally or more locally.
- Ecosystems which provide the habitats required by the above species.
- Species that are afforded legal protection.

- Endemic or locally distinct sub-populations of a species.
- Habitat diversity, connectivity and/ or other synergistic associations.
- Priority Species and Habitats under the Natural Environment and Rural Communities (NERC) Act, 2006.
- Notably large populations or concentrations of animals considered uncommon or threatened in a wider context.
- Plant communities that are considered to be typical of valued natural/ semi-natural vegetation types.
- Species at the edge of their range.
- Species-rich assemblages of plants or animals.

9.20 Habitats, species and sites identified in the baseline conditions will all be attributed an ecological importance. The importance or potential importance of an ecological feature will be described in a geographical context (i.e. International, National, Regional, County, District and Local importance). Furthermore, a category of 'Site' importance will be applied to a feature which is present or potentially present at the site, but where the importance to nature conservation of the feature is of relatively low value in the context of the wider landscape. A further 'Negligible' category will be assigned to features of no particular intrinsic nature conservation importance. Consequently, each habitat, species or site of 'Site' importance or above will be termed an Important Ecological Feature (IEF).

9.21 In line with the guidelines set out by CIEEM, the impacts of the Development will only be assessed on those IEFs with importance equal to, or higher than 'Local' level, or where mitigation is required for non-IEFs where it is necessary to ensure legal compliance. Habitats or species which are present for which there may be a potential breach of legislation will be considered to be IEFs, even if the feature itself is not considered to be of significant intrinsic nature conservation importance. Non-statutory designated sites will also be identified as IEFs where these lie within the Zone of Influence of the Development.

9.22 Published selection criteria, contained within the selection of Biological Sites of Special Scientific Interest (SSSI), can also be referred to aid the assessment of importance. Where significant habitats, such as Ancient Woodland, do not carry a designation, these are nevertheless considered at an appropriately chosen geographic level (Site, Local, District, etc.).

Characterisation of Impacts

9.23 When assessing the impact of the Development and impacts on baseline conditions, predictions will be made which focus solely on the Zone of Influence for each IEF in the context of the lifetime of the Development (40 years). The Zone of Influence will be assessed separately for each individual feature. Attributes considered when defining the Zone of Influence of the Development on each IEF include the vulnerability of sites and habitats to the effects of construction and operation of the different elements of the Development, the mobility of species both on and surrounding the Sites, the sensitivity of species to noise and disturbance, the impacts on transient or migratory species and the importance of any particular species or habitats as keystone features within local ecological networks.

9.24 Each potential impact on an IEF will be assessed at its respective geographical scale. Where appropriate, the following parameters will be used in characterising impacts:

i. Positive or Negative (whether the impact will have a Positive or Negative effect)
ii. Magnitude (the size of the impact)
iii. Extent (area of which the impact occurs)
iv. Duration (time impact expected to last before recovery)
v. Reversibility (an impact may be permanent or temporary); and

vi. Timing and frequency (impact may be seasonal e.g. bird nesting season).

9.25 Impacts are described as being short-term, medium-term and long-term. Generally short-term impacts are taken as those which are not anticipated to persist for longer than 3 years, medium-term impacts are those which persist between 4 and 10 years and long-term impacts are those which are anticipated to persist over a period in excess of 10 years. It should be noted that for certain species groups, such as invertebrates, a short-term impact of two years may constitute 4 generations and as such may be more consistent with a medium-term impact for this species group. Where short, medium or long-term are considered to deviate from the timeframes described above this is highlighted for that particular habitat or species.

Application of the Mitigation Hierarchy and Net Benefit for Biodiversity

9.26 A stepwise approach of avoidance, mitigation and compensation will be followed when reducing potential impacts.

9.27 Negative impacts can be avoided altogether through fundamental scheme design choices, such as which fields to include within the final Development and the extent of the final Development boundary. Designed-in avoidance of impacts is included within the term 'embedded mitigation' within this assessment. Other forms of embedded mitigation measures include any design measures needed for legal compliance or to implement good practice guidance, for example the use of protective fencing during the construction phase or the adoption of protective buffer zones free of development which ensure offsets from sensitive habitats.

9.28 'Additional mitigation' is any measure required to reduce a certain impact to acceptable levels where embedded mitigation alone is not sufficient. This is likely to take the form of a specific plan or strategy specific to a species, species group or habitat and will be detailed under each relevant IEF's subheading. Such mitigation can be secured by planning conditions.

9.29 Mitigation measures are also identified for species which did not qualify as IEF but which are afforded legal protection under the Wildlife and Countryside Act (1981) or other legislation, and as such will require certain precautionary methodologies to avoid offences being committed.

9.30 Compensation measures may be appropriate for IEFs which are likely to experience significant effects once mitigation options have been exhausted. Compensation measures seek to offset these residual effects, for example through the provision of alternative habitat either elsewhere within or outside of the Order Limits. An examination of the uncertainty in achieving successful compensation will take place. Finally, any remaining residual effects can then be assessed.

9.31 Ecological enhancement measures are those which are not expressly required in order to deliver mitigation or compensation, but are included to provide further benefits for nature conservation.

9.32 Planning Policy Wales (PPW) 12[i] sets out that "planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means that development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity" (para 6.4.5 refers).

Residual Effects and Assessment of Significance

9.33 Following the methodology described by CIEEM, an ecologically significant effect is defined as "an effect that either supports or undermines biodiversity conservation objectives for 'Important Ecological Features' (IEF) or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local".

9.34 In line with CIEEM guidance, significance of residual effects will be described as being 'significant' or 'not significant'. As CIEEM guidance discourages the use of the matrix approaches to assign categories (e.g. minor, moderate, major) to residual effects, 'significant' residual effects will be qualified with reference to the appropriate geographical scale at which the effect is considered to be felt (i.e. Site, Local, District, County, National or International).

Cumulative and In-combination Effects

9.35 Other projects that are constructed, consented or emerging proposals of sufficient size, scale and nature to cause or increase effects upon IEFs in combination with the Development, will be examined. Cumulative effects may be additive or synergistic and result from individually non-significant but collectively significant impacts. Implications for further mitigation or compensation will be considered, as well as changes to any likely residual effects. The cumulative schemes set out in Chapter 2 of this ES will be reviewed and considered in the assessment, as appropriate.

Limitations and Assumptions

9.36 Any difficulties encountered and assumptions made about data sources, baseline conditions or assessment of effects are provided within each technical appendix relevant to the IEF or in the text below.

Baseline Conditions and Ecological Evaluation

9.37 This section provides ecological information describing the current ecological baseline conditions present across the Development derived from desk study and field survey data, together with a summary of the kinds of impacts on ecological features which may arise from the Development.

Study Area and Ecological Context

9.38 As described in Chapter 3 of the ES, the Development predominantly comprises large, undulating agricultural fields, in use for cereal and non-cereal arable crop production, and as a livery. A small stream flows north and west through the Site, following field boundaries, as well as a watercourse running alongside the southwestern boundary.

9.39 Alleston Wood, a remnant woodland with Ancient Woodland Indicator species recorded, lies between the northern and southern parcels of the Development, outside of the red line boundary. A large waterbody is found to the south of Alleston Wood, within the red line boundary.

Designated Sites

9.40 Statutory and non-statutory designated sites for nature conservation were identified within the desk study element of the PEA (in Appendix 9.2) The following search criteria were used:

- International designated sites (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites) were searched for within 10km of the Development.
- National sites (e.g. Sites of Special Scientific Interest (SSSIs)) and Local Nature Reserves (LNR) were searched for within 5km.
- Local sites (Such as Local Wildlife Sites (LWSs)) were searched for within 2km.

9.41 These search radii are standard distances used in ecological impact assessment for projects of this nature and scale. It is considered unlikely that the Development would give rise to impacts on designated sites beyond these ranges.

Findings

9.42 Table 9.1 details designated sites that have been identified within proximity to the Site.

Table 9.1: Designated Sites Identified in Proximity to the Site

Designated Site	Designated for?	Distance / Direction from Site
Pembrokeshire Marine SAC	Habitats and species associated with marine environments.	1.7km northeast

Bristol Channel Approaches SAC	Population of harbour porpoise.	1.9km southeast
Pembrokeshire Bat Sites and Bosherston Lake SAC (incorporating Stackpole SSSI, Stackpole Courtyard Flats and Walled Garden SSSI, Slebech Stable Yard Loft, Cellars and Tunnels SSSI, Felin Llwyn-gwair SSSI, Carew Castle SSSI, Beech Cottage Waterwynch SSSI, Orielton Stable Block and Cellars SSSI, Park House Outbuildings SSSI)	Outstanding marl lake system that covers eight associated SSSI sites designated for presence of greater and lesser horseshoe bats and otter.	3.9km southwest at nearest point
Castlemartin Coast SPA	Linear strip of outstanding maritime habitats with breeding choughs present.	4.5km southwest
Freshwater East Cliffs to Shrinkle Haven SSSI	Geological features and coastal cliff habitats and species that it supports.	1.7km southeast
Stackpole Quay to Trewent Point SSSI		1.9km southeast
Milford Haven Waterway SSSI	Geological interest and coastal habitats.	2.1km northwest
Stackpole National Nature Reserve (NNR)	Unique combination of natural and man-made landscapes including coastal dune system, beaches, low sea cliffs and lakes.	4.0km southwest
Freshwater East LNR	Habitats including dune grassland, woodland and reed marsh, which support a good diversity of species.	1.2km south
Pembroke Mill Ponds LNR and Wildlife Trust Reserve (WTR)	Priority ponds with developing reed bed and carr, and adjoining woodland.	1.0km northwest

Field Survey Methodologies and Scope

9.43 The ecological field surveys which have been carried out across the Site are described below along with applicable methodological notes and survey scope rationale:

- **Extended Phase 1 Habitats Survey** All land within the Site was surveyed through a thorough walkover of all accessible land within the Site, and up to 30m beyond this (where accessible and relevant) to collect baseline habitat inventory. The survey paid close attention to any potential Habitats of Principal Importance or local priorities, including hedgerows. A qualitative assessment of habitat suitability for the following species/groups was undertaken at the same time to identify those which may be at risk from being impacted by the Development, to inform future survey needs:
  - Badger (setts and signs of activity recorded in all accessible habitats)
  - Bats (ground-based, daytime inspections of trees present on or adjacent to the Development for potential roost features, and assessment of potential value of habitats to foraging and commuting bats)
  - Dormouse (to assess habitat for elevated suitability)
  - Otter and water vole (visual inspection of watercourse habitat suitability)

- Amphibians (to identify terrestrial and aquatic/breeding habitat of particular potential).
- Breeding birds (particular focus on likely presence of ground nesting birds, such as skylark and yellow wagtail, as well as Schedule 1 or Priority species including barn owl, hobby or peregrine).
- Wintering birds (assessment of suitability of habitat to support significant numbers of notable overwintering birds)
- Reptiles (to assess habitat for elevated suitability)

- **Breeding Birds** Two survey visits were undertaken in April and May 2023 and two visits undertaken in March and April 2024. Method follows British Trust for Ornithology (BTO) Common Bird Census techniques as informed by **http://birdsurveyguidelines.org**. Observations were recorded onto paper maps using BTO symbology which were later digitised for analysis using QGIS.

- **Wintering Birds** Four survey visits were undertaken between November 2023 and March 2024. Method follows BTO Common Bird Census techniques as informed by **http://birdsurveyguidelines.org.**

- **Bats (Static Detector Surveys)** Monthly bat detector surveys of the Site utilising ten detector locations per month between July and October 2023, and April and June 2024 (seven months). Informed by Bat Conservation Trust Good Practice Guidelines (2024), locations chosen were at hedgerows and woodland edges to gain a representative sample of bat species assemblage and activity. Due to the extent of the hedgerow and field boundary network within the Site, and the difficulties at certain time of year moving around the fields due to the limited field margins, it was considered impractical to carry out effective transect surveys and unlikely to add meaningful data over and above that which could be derived from the data collected during the static detector deployments.

- **Otter and Water Vole** Assessment of all watercourses and ditches within Site for suitability for otter and water vole in February 2024. A further inspection of watercourses undertaken in April and June 2024, to include an assessment of the suitability of watercourses up to 200m outside of the Site.

- **Badger** Ad hoc records of badger setts have been made throughout the survey period, with sett locations recorded digitally and setts classified according to likely status and activity where identified.

9.44 The survey effort and scope presented above reflects what is believed at the time of writing to be sufficient and proportionate to inform the evaluation of baseline conditions for the Development based on professional judgement, and through consultation with NRW and PEDW, as appropriate.

Future Baseline

9.45 In the absence of the Development, the fields would remain in agricultural production and as grazing pasture resulting in the continued improvement of associated grassland and surrounding habitats due to the continued application of fertilisers and chemicals (such as herbicides). This would likely result in no change, or a slight gradual reduction in botanical diversity across the Site, leading to a reduction in overall species-richness over time. It is also considered likely that the continued leaching of agricultural run-off onto watercourses around the Site would result in a general overall reduction in water quality over time, or at least no improvement, potentially seeing more frequent filamentous algae or blanketweed as a result.

Current Baseline; Habitats

9.46 The following section provides a summary of the extent and character of the various habitats that occur within the Site, as derived from the fieldwork to date. The associated likely ecological importance of each habitat is also provided.

9.47 A Preliminary Ecological Appraisal, which lays out the ecological constraints and opportunities associated with the Development are provided in **Appendix 9.2**.

Woodland and Scrub

9.48 Alleston Wood is located within the red line boundary and is an unmanaged remnant of ancient woodland with a stream running through the centre. It is a Habitat of Principal Importance.

9.49 A discrete area of mixed scrub is located at the base of a pylon in the northwest of the Site within Field 1. This area comprised few ash trees, with blackthorn, buddleia and dense bramble scrub. Ruderal species including ragwort, hogweed, willowherb species, thistle species, common nettle and cleavers were also recorded. Other species here included water figwort, red campion, foxglove, ground ivy, cut-leaved cranesbills and herb Robert.

9.50 A steep bank of dense gorse scrub is present in the south of the Site, within the eastern boundary of Field 4.

9.51 Considering woodland and scrub habitats are generally limited to areas adjacent to the Site, with only discrete areas of scrub present onsite, these habitats are considered to be of **Local Importance**.

Arable Fields

9.52 The Site is dominated by arable fields, and are intensively farmed monocultures, focusing on potatoes and corn, which appeared to have regularly received fertiliser, herbicide and potentially pesticide treatments. The arable fields are, therefore, generally botanically poor and contained little ecological interest, save for their value to a relatively small number of ground-nesting birds (skylark).

9.53 Lowland farmland is a local priority habitat in Pembrokeshire, however, as the fields associated with Alleston Farm were of negligible botanical interest, the arable fields were considered to be of **Site Importance** only.

Grassland and Arable Field Margins

9.54 Few fields utilised as a horse livery were subject to permanent grazing and were found to comprise improved grassland.

9.55 The uncultivated field margins were generally observed to be very narrow (<1m) or completely absent with the exception of one area through which a public bridleway was routed (Field 9), an area on a steep slope which was, therefore, left purposefully wide (Fields 9 and 11), and the southern boundary of Field 8. These are, however, generally species-poor and dominated by Yorkshire fog and comprised widespread species such as ribwort plantain, creeping buttercup, curled dock, ragwort, dandelion and cranesbill species, and is poor in terms of structure.

9.56 Corn spurrey *Spergula arvensis* was recorded during the extended Phase 1 survey within the margin of a single field; this plant is most often found associated with arable fields and is classified as ‘Near Threatened’ in the Vascular Plant Red List for Wales (2008). Maple-leaved goosefoot *Chenopodiatrum hybridum*, which is a rare occurrence in Wales, was recorded within an area of disturbed ground in proximity to a muck heap.

9.57 Grassland is a local priority habitat in Pembrokeshire, although no grassland of high distinctiveness was found within the Site. The improved grassland fields and field margins are considered to be of **Site Importance**.

Hedgerows and Trees

9.58 The Site contains a network of 35 managed hedgerows totalling almost 8km, of which few contain mature and semi-mature trees. Most were classified as species-poor, being dominated by hawthorn or blackthorn, while one was considered species-rich.

9.59 Three mature ash trees are located within Field 6, to the north of the farmhouse. A further group of six and eight mature ash and oak trees were located within Field 7 in the north of the Site, adjacent to the northern site boundary.

9.60 Hedgerows are a local priority habitat and are a Habitat of Principal Importance.

9.61 Hedgerows and trees around the Site are considered to be of **Local Importance.**

Watercourses and Ditches

9.62 A small stream (<2m width) runs along the northern and southern Site boundaries, and through the centre of the Site, where it passes through Alleston Wood and feeds a large pond. A further pond is associated with the stream approximately 75m southwest of the Site. In the southern section of the Site, the stream was associated with a steep valley section and wetland habitats were present within the riparian corridor, inclusive of riparian woodland.

9.63 A straightened section of stream bisects the fields within the north of the Site with water flowing from the eastern boundary to where it meets the main stream to the west. This section featured hedgerows on the southern aspect. The northern bank was generally grassy and colonised by ruderal vegetation and some species associated with wetland habitats such as willowherbs.

9.64 Sections of the stream are culverted in multiple locations, primarily to accommodate access routes across the farm.

9.65 Water levels within the watercourses fluctuated seasonally, and the straightened sections and ditch were found to be dry through part of the year.

9.66 While the watercourses found on Site do not directly feed into the Bosherton Lakes, they do make up part of a wider network of watercourses that are associated with the lakes.

9.67 A section of ditch, often observed with water flowing north to south, was present adjacent to the southern section of the main farm access road and associated with a hedgerow to the west.

9.68 Freshwater is a local Priority Habitat in Pembrokeshire and the watercourses associated with the site are considered to be of **Local Importance**.

Current Baseline; Species

Badger

9.69 Badgers, including their setts, are protected under the Protection of Badgers Act, 1992. The precise locations of badger setts are kept confidential.

9.70 Numerous records of badgers, and their setts, were returned within the desk study (Appendix 9.8 refers).

9.71 Alleston Wood was not extensively searched for badgers during the extended Phase 1 survey, although their peripheries were entered to 30m where accessible and/or where potential mammal pathways led into them. Where present, signs of badgers were also noted during further survey of the stream corridor for otter and water vole, which runs through Alleston Wood. Setts were noted where there was evidence, such as pathways or latrines, visible from the field edges, or within hedgerows.

9.72 A main badger sett and a further outlier were recorded within boundary vegetation associated with the Site (see Figure 1 in Appendix 9.8).

9.73 The Site contains significant extents of habitat suitable for foraging by badgers, across the arable fields and the field margins. Badgers predominantly feed on soil invertebrates, but will take a variety of plant and animal prey depending on availability. Arable fields have a lower earthworm abundance than grassland fields, therefore the uncultivated margins, woodlands, and hedgerows are likely to be more productive for badgers.

9.74 Badgers are not a species of conservation concern, but receive legal protection on account of historic and ongoing persecution. Consequently, they are considered to be of **Site Importance** in terms of conservation status, but will nonetheless be included within the impact assessment due to these legal obligations.

Bats

9.75 All bat species and their roosts are fully protected under the Habitats Regulations, are Species of Principal Importance and are local Priority Species in Pembrokeshire.

9.76 Detailed methodologies, mapping and survey results pertaining to the habitat assessment and static detector activity surveys are given in **Appendix 9.3.**

9.77 In excess of 140 desk study field records returned by Aderyn identified common pipistrelle *Pipistrellus pipistrellus,* soprano pipistrelle *P. pygmaeus*, Noctule Bat *Nyctalus noctula*, greater horseshoe bat *Rhinolophus ferrumequinum*, lesser horseshoe bat *R. hipposideros*, brown long-eared bat *Plecotus auritus*, myotis species *Myotis spp.* including Natterer's and Daubenton's bats, barbastelle bat *Barbastella barbastellus*, and further unidentified bat species within 2km of the Site. Records comprised animals in flight and roosting in the local area.

9.78 The nearest records to the Site originated 0.09km away in 2018 and comprised records of common and soprano pipistrelle and lesser horseshoe bats. It is not indicated whether or not these were roosting bats. The nearest record of confirmed roosts were returned as part of a monitoring project between 1985 and 2010, originating approximately 0.18km (although only to a 4-figure grid ref) from the Site and comprised records of common and soprano pipistrelle and noctule bat roosts. Two records of barbastelle roosting within beech trees were returned as part of licence returns in 2016, both between 0.35-0.37km from the Site.

9.79 Initial habitat assessment determined that the quality of habitats for bats across the Site as generally low, being dominated by monoculture arable and grazed pasture. However, the network of hedgerows, watercourses, occasional mature trees and Alleston Wood elevated this value somewhat by providing strong corridors for dispersal and foraging, and opportunities for roosting.

9.80 Bat survey information was gathered through the use of ten automated static detectors deployed monthly for seven months. Over 142,000 bat passes were recorded over 374 recording nights at ten deployment locations. This equates to an average of approximately 380 bat passes per recording night. This is considered to represent a moderate level of bat activity in comparison to other sites throughout Wales.

9.81 The survey data shows that a high diversity of species is present across the Site, with at least nine species recorded. The majority of activity was made up of common and soprano pipistrelle bats. Rarer species recorded included lesser and greater horseshoe bats, which are both species listed on the designation of the Pembrokeshire Bat Sites and Bosherston Lake SAC, barbastelle bats, which are a woodland specialist, and serotine bats for which the Site is located at the western edge of the species' range. These species were recorded in relatively low densities. Two passes by Nathusius' pipistrelles were also recorded, which are a strongly migratory species.

9.82 It is likely that the hedgerow and stream network around the Site, as well as Alleston Wood, all represent valuable habitat in the locality for foraging and commuting by the species recorded.

9.83 The buildings associated with Alleston Farmhouse were not subject to an assessment for their potential to support roosting bats as, while present within the red line boundary, they remain outside of the Development footprint and of the Zone of Influence since changes resulting from the Development are considered highly unlikely to directly affect access to or from a roost, where present. This approach is considered to be appropriate given that the farmyard, and buildings therein, are bound by a mature woodland and hedgerow network, which will remain unimpacted by the Development. No fragmentation or degradation of suitable habitat for bats would occur as a result of the Development, and no obstruction to roost accesses, if present, nor isolation of potential roost sites would therefore occur.

9.84 It is considered that, given the general assemblage of bats on Site, which included generally high rates of activity by rarer species, and the connectivity of the site with the designated sites, bat species are of **District Importance**.

Breeding Birds

9.85 Many bird species are listed as Species of Principal Importance and appear as either green, amber or red-listed species within the RSPB/BTO Birds of Conservation Concern lists. Farmland birds appear on the Pembrokeshire LBAP. All birds and their eggs are protected, while some which appear in Schedule 1 to the Wildlife and Countryside Act 1981 are protected further from disturbance while nesting.

9.86 From the desk study records for the survey area, notable species included farmland birds such as curlew, fieldfare, lapwing, linnet, skylark and yellowhammer, as well as barn owl, waterfowl, waders and raptors. Records of 74 species of notable birds, or birds of conservation concern, were returned, of which all originated from outside of the survey area boundary, which is likely due to lack of data from within it rather than an absence of species. The records returned are detailed in **Appendix 9.4**.

9.87 In total, 59 bird species were recorded across the Site by the surveys. Of these, 32 were species of conservation concern / notable species, comprising 11 red-listed and 21 amber-listed species; with ten also being Species of Principal Importance. In addition, two species were listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), and two species were listed under the Pembrokeshire LBAP. This was considered to be a moderately rich species assemblage, but is likely to be representative of the local area which is characterised by mixed farming and an abundance of hedgerows, woodland and scrub within the landscape.

9.88 The nesting habitats present within the survey area which are of greatest value to breeding birds were generally restricted to the hedgerows and trees, adjacent woodland, gorse scrub and any uncultivated field margins and rough grassland. Many species observed have also adapted to utilise the open fields to secure territories and foraging resources throughout their breeding season (such as, linnet and yellowhammer) and, for some, to support their overwintering populations. This includes arable managed fields and pasture, even where intensive management has created habitats that are overall suboptimal for a large proportion of species.

9.89 Taking into account the conservation status of the species recorded as well as their relative abundance on Site, it was considered that skylark, meadow pipit, dunnock, wren, linnet, song thrush and rook were all of **Local Importance**, while all other species were of **Site Importance.**

Overwintering Birds

9.90 The desk study records for the survey area returned 39 bird species of conservation importance which overwinter in the UK. Of these, house sparrow, barn owl, redwing and skylark and were recorded within 400m of the Site, while fieldfare were recorded within 500m and lapwing within 800m.

9.91 As discussed, the majority of the Site was managed as spring-sown arable or livery, with few fields containing pasture, grassland or overwinter stubbles, which are of greater interest to overwintering birds for foraging purposes.

9.92 In total, 47 bird species were recorded across the Site by the surveys. Of these, 22 were species of conservation concern / notable species, comprising ten red-listed and 12 amber-listed species; with ten also being Species of Principal Importance. In addition, three species were listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended and two species were listed under the Pembrokeshire LBAP. This assemblage is considered to be moderately species-rich and typical of similar mixed farmland within the local area.

9.93 A modest population of gulls and snipe were recorded sheltering within the arable fields, along with other species like linnet, meadow pipit, skylark, rook, starling and yellowhammer which were all recorded foraging in the fields, too.

9.94 In combination, the Site was considered to be of **Local Importance** to wintering birds as an assemblage.

Dormouse

9.95 No records of hazel dormouse were returned within the desk study, although records of dormouse do exist for Pembrokeshire and the species is generally known to be under-recorded.

9.96 The Site offers suitable habitat for dormice in the form of mature hedgerows and woodland around the Site. Although specific surveys for the species were not undertaken, it is assumed that they are likely present within the Site at a low density. This approach was agreed at the outset with PCC following consultation with the LPA (Appendix 9.1 refers).

9.97 If present, dormice are likely to be of **Local Importance** in the context of the Development.

Otter

9.98 Baseline information pertaining to otter vole is provided in Appendix 9.6.

9.99 Otters are a Species of Principal Importance, protected under the Habitats Regulation, and are a local Priority Species in Pembrokeshire. Otter are a qualifying feature of the Pembrokeshire Bat Sites and Bosherston Lakes SAC, located approximately 3.9km to the southwest of the Site.

9.100 Twenty-six records of otter were returned within 2km of the Site and are relatively widespread in Pembrokeshire.

9.101 During the survey of the watercourses, otter spraint was recorded within Alleston Wood, associated with the section of stream offering higher quality habitat. A likely holt was recorded within the stream associated with the southernmost section of the Site, and features conducive to holt creation were generally devoid elsewhere within the Site. The straightened section of the stream across the north of the Site, and the northern section of the main stream was considered to offer habitat of poor suitability for otter, given the lack of field margins and proximity of agricultural activities, lack of suitable prey items, and lack of holt creation opportunities. There were no major watercourses on, or adjacent to, the Site, which tend to offer greater foraging resources to otter and, as such, it was considered that otter are likely present in low numbers, primarily in the centre and south of the Site.

9.102 Hydrologically, the Site did not appear to be linked to Bosherston Lakes and associated designated sites, as the stream flowed northwest toward Pembroke. The network of hedgerows and woodland in the wider landscape also did not appear to provide a contiguous corridor for otter movement, although this does not preclude the presence of otters associated with the SAC from the Site.

9.103 Given the potential for breeding otter to be present within the stream network associated with the Site, otter are considered to be of **Local Importance**.

Water Vole

9.104 Baseline information pertaining to water vole is provided in Appendix 9.6.

9.105 Water vole is a Species of Principal Importance.

9.106 No records of water vole were returned within 2km of the Site and, although the species is likely to be present in the wider area, records are sparsely distributed in Pembrokeshire.

9.107 Habitat requirements for water vole focus on shelter (diggable earth banks), aquatic vegetation and reliable access to water; the watercourse network around the Site was generally considered to offer sub-optimal, poor or unsuitable habitat for water voles due to a lack of these features. Notably, the stream lacked high quality feeding resources and, in the centre of the site, lacked banks of a sufficient height within which to dig burrows. It is concluded that water voles may be present within the more suitable (regularly wetted and vegetated) sections of the watercourses sporadically through the year, although the site is unlikely to represent key component of their range within Pembrokeshire.

9.108 Water vole, if present, are considered to be of **Local Importance**.

Other Mammals

9.109 Other mammals which are Species of Principal Importance and potentially present on Site and capable of being impacted include hedgehog and polecat.

9.110 Twenty-two records of hedgehog were returned within the desk study, with the nearest approximately 0.5km from the Site and most recent record occurring in 2022. Habitats on Site may support foraging for this species and movement around the wider landscape, particularly with the hedgerow network and wider field boundaries. Given that hedgehog numbers are in decline nationally and that the Site does not represent optimal habitat, being dominated by arable cropland and grazed grassland, the Site is considered as being of **Local Importance** for this species.

9.111 Two records of polecat were returned within the desk study, originating in 2013 (0.9km from Site) and 2018 (1.9km). West Wales represents a stronghold for this species, and the presence of Alleston Wood adjacent to the Site boundary, and hedgerows and scrub within the Site offers suitable habitat for this species, albeit limited in its extent in the context of the arable fields. Polecat populations in Wales have increased following recovery from past persecution and are likely to continue to do so. Consequently, polecat are likely to be of **Local Importance** in the context of the Development.

Reptiles and Amphibians

9.112 Reptiles and Amphibians are Species of Principal Importance and receive varying levels of protection under the Wildlife and Countryside Act 1981. They are LBAP species.

9.113 Thirty records of reptiles within 2km of the Site were returned during the desk study, comprising common lizard, slow-worm and grass snake. Adder, were also present within the data (8 records), although it should be noted that these were all generally associated with the nearby beach and dune system at Freshwater East and Stackpole.

9.114 Twenty-two records of amphibians were returned from Aderyn, which comprised common frog, common toad, and palmate newt were returned within 2km of the Site.

9.115 The Site is outside of the known range for great crested newt, which are considered to be absent from within the Site boundary.

9.116 Habitats on Site are largely unsuitable for adder, despite data search records, although presence of the species within boundary features cannot be completely ruled out.

9.117 The hedgerow, stream and ditch network may be used for shelter and commuting by a variety of reptile and amphibian species, while areas of long grass and scrub may be used for shelter and foraging. The ponds within Alleston Wood and to the southwest of the Site, and surrounding wet woodland are likely to provide key habitat. Since the majority of the survey area comprises habitats of limited value to reptile and amphibian species, i.e. arable and livery, specific surveys were not considered proportionate to undertake.

9.118 No ad hoc reptile or amphibian records were made during the site survey visits.

9.119 Considering the restricted extent and suitability of habitats for widespread reptile and amphibian species, and their likely presence across the Site at a low or very low density, the Site is considered to be of **Site Importance** for these species.

Invertebrates

9.120 Records of 36 notable invertebrate species were revealed by the desk study, comprising two butterfly and 34 moth species.

9.121 Brown hairstreak and southern damselfly appear on the Pembrokeshire LBAP. These species are associated with hedges, scrub and woodland edge comprising mature ash and blackthorn, and with base-rich streams often within acid heathland areas, respectively, of which neither occur within the footprint of the Development.

9.122 The principal habitats present within the Site boundary, including arable fields, streams and ditches, improved (modified) grassland fields and semi-improved grassland boundaries, hedgerows and mature trees, are only likely to support common invertebrate assemblages typical of the local arable farming landscape considering the limited extent or intensive management of these habitats, minimal buffer

habitats, and likely overspray and run-off of pesticides and other treatments. Habitats, such as ponds and mature woodland, which lie outside of the development footprint, are likely to support a greater diversity of invertebrate species.

9.123 Ad hoc records of invertebrate species arising from Site visits included St. Marks fly *Bibio marci*, horsefly *Tabanidae sp.*, scorpionfly, figwort sawfly *Tenthredo scrophulariae*, common carpet moth *Epirrhoe alternata*, mullein moth *Cucullia verbasci*, speckled wood *Pararge aegeria*, common carder bee *Bombus pascuorum,* red-tailed bumblebee *B. lapidarius*, 7-spot ladybird *Coccinella septempunctata*, blue-tailed damselfly *Ischnura elegens*, beautiful damselfly *Calopteryx virgo*, swollen-thighed beetle *Oedemera nobilis*, and nettle weevil *Phyllobius pamaceus*. No notable invertebrate species were recorded during the surveys, although specific surveys were not undertaken.

9.124 The invertebrate assemble within the Site is likely to be of **Site Importance** in the context of the Development.

Invasive Non-native Species

9.125 Invasive species appear on the Pembrokeshire BAP.

9.126 Records of Japanese knotweed *Impatiens glandulifera* and Himalayan balsam *Fallopia japonica* were returned in the desk study approximately 0.7 and 1.0km from the Site, respectively.

9.127 Buddleia was recorded within the Site boundary within an area of scrub in the north of the Site. Japanese knotweed, monbretia and also buddleia were recorded adjacent to the Site boundary during the Phase 1 survey, all associated with Alleston Wood (Figure 9.2 and Table 9.2 refers). Of these, Japanese knotweed is listed as a Schedule 9 invasive non-native species within the Wildlife and Countryside Act (1981), as amended. As such, it is illegal to release or cause the dispersal of this species and therefore they will be considered within the impact assessment as a non-IEF included in light of legal obligations.

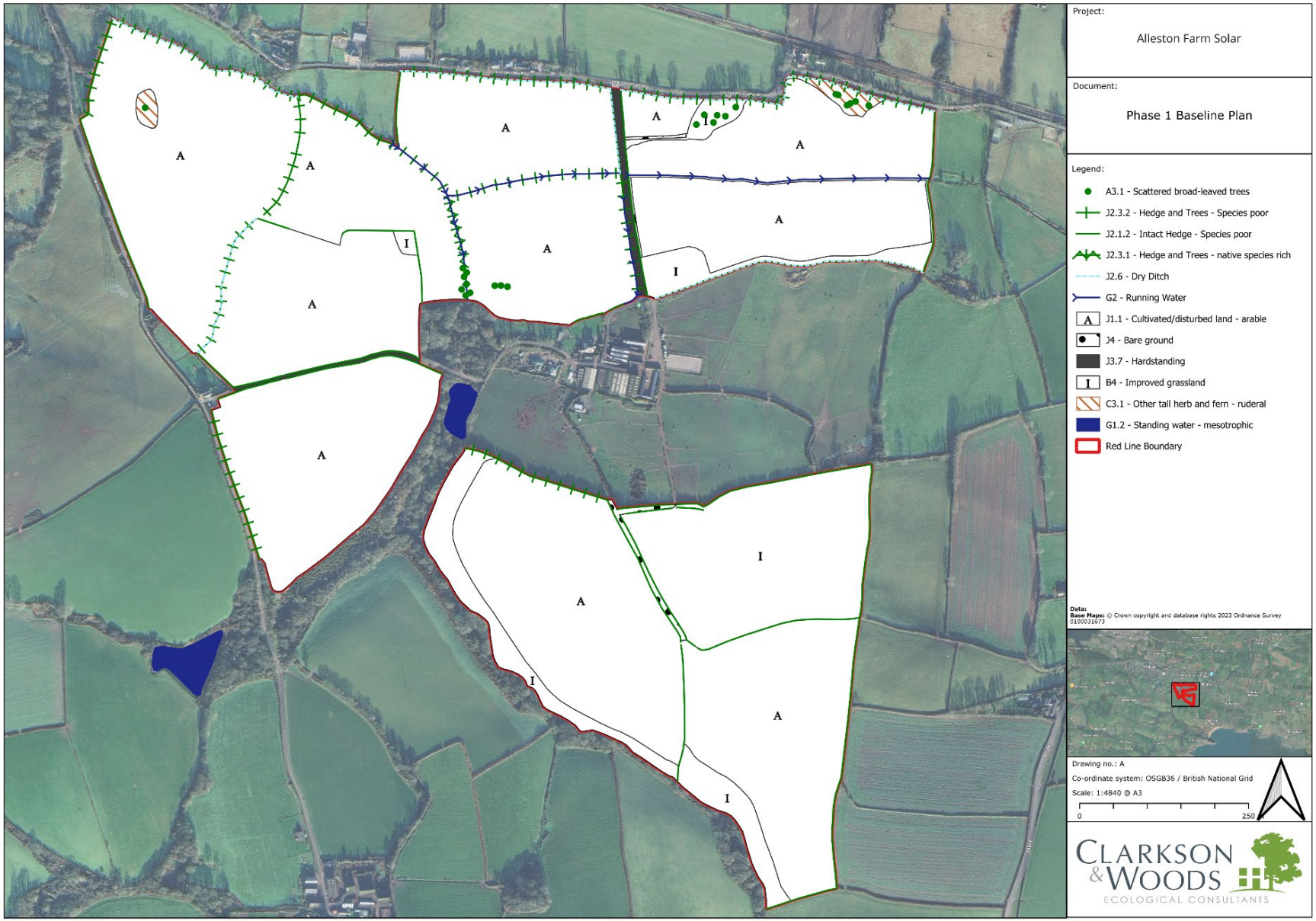

Figure 9.1: Extended Phase 1 Habitat Survey (Red Line Boundary given at time of survey)

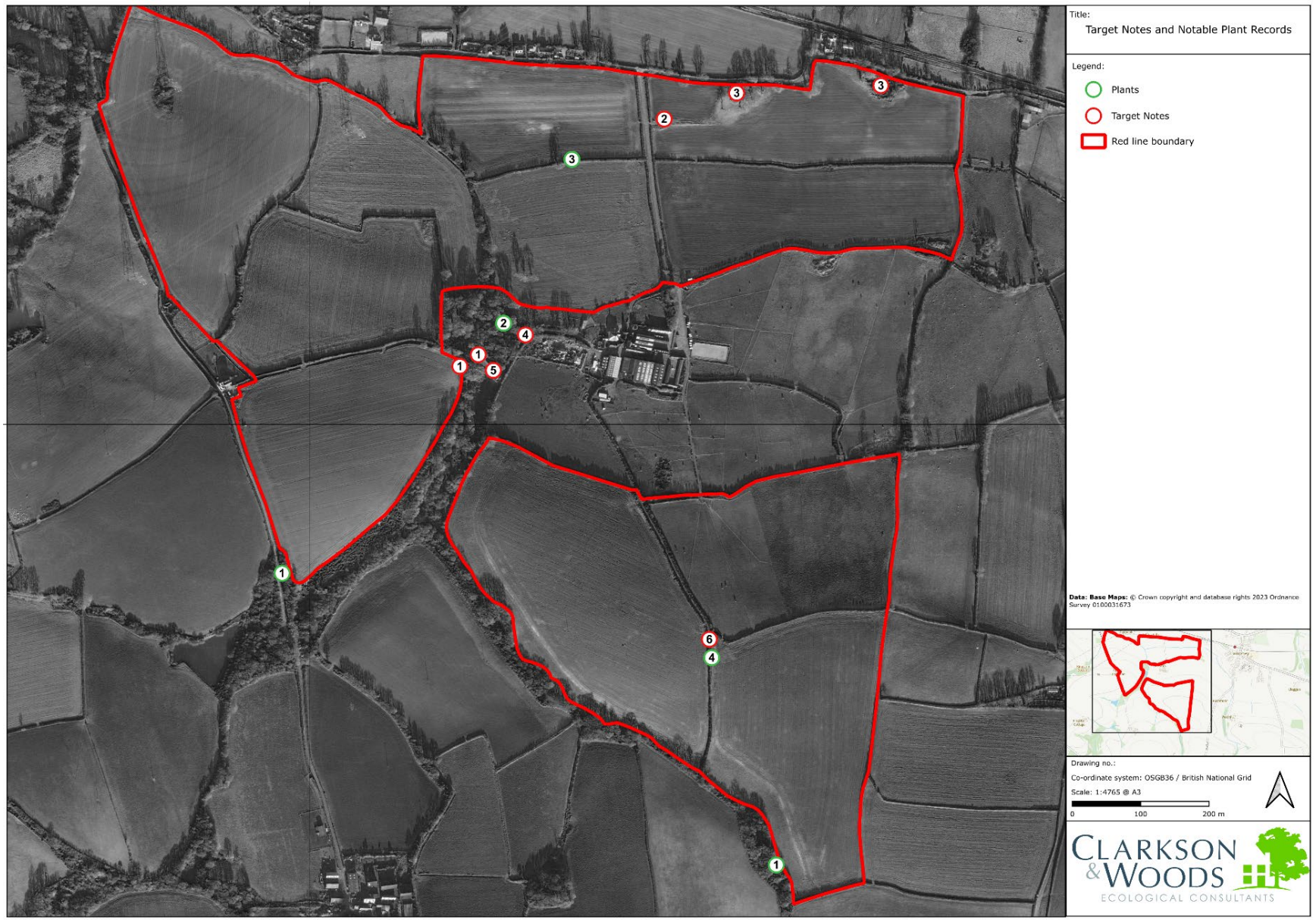

Figure 9.2: Phase 1 Survey Target Notes (Red Line Boundary given at time of survey)

Table 9.1: Description of Target Notes (Figure 9.2 refers)

Target Note		Description
Red	1	Rubble pile; may offer suitable shelter to wildlife such as widespread reptiles and amphibians
	2	Old cart wash, now dry. Concrete lined; presents potential for enhancement if restored
	3	Large area of dumped materials; buried waste
	4	Litter pile; may cause pollution to watercourse
	5	Culverted section of stream, liable to flooding over road
	6	Large muck heap; may provide nesting opportunity to grass snake, if present
Green	1	Bluebells *Hyacinthoides non-scripta*; Schedule 8 species, ancient woodland indicator species
	2	Japanese knotweed *Reynoutria japonica*; Schedule 9 Invasive Non-native species
	3	Corn spurrey *Spergula arvensis*; 'Near Threatened' in the Vascular Plant Red List for Wales (2008)
	4	Maple-leaved goosefoot *Chenopodiatrum hybridum*; rare in Wales

Ecological Evaluation Summary

9.128 Table 9.3 summarises the Ecological Evaluation. All features considered Important Ecological Features (IEF) will be carried through to the assessment of effects.

Table 9.2: Summary of Ecological Evaluation

Ecological Feature	Ecological Importance	IEF?
Pembrokeshire Marine SAC	International	Yes
Bristol Channel Approaches SAC	International	Yes
Pembrokeshire Bat Sites and Bosherston Lake SAC	International	Yes
Castlemartin Coast SPA	International	Yes
Freshwater East Cliffs to Shrinkle Haven SSSI	National	Yes
Stackpole Quay to Trewent Point SSSI	National	Yes
Milford Haven Waterway SSSI	National	Yes
Stackpole NNR	National	Yes

Ecological Feature	Ecological Importance	IEF?
Freshwater East LNR	Local	Yes
Pembroke Mill Ponds LNR and WTR	Local	Yes
Bare Ground	N/A	No
Woodland & Scrub (including Ancient Woodland)	Local	Yes
Arable Fields	Site	No
Grassland: Improved Grassland	Site	No
Grassland: Arable Field Margins and Semi-improved Grassland	Site	No
Hedgerows & Trees	Local	Yes
Watercourses & Ditches	Local	Yes
Badger	Site	No, but included in assessment due to legal protection
Bats	District	Yes
Breeding Birds	Local (skylark, meadow pipit, dunnock, wren, linnet, song thrush and rook) Site (all other species)	Yes
Overwintering Birds	Local	Yes
Dormouse	Local, if present	Yes
Otter	Local	Yes
Water Vole	Local, if present	Yes
Hedgehog	Local, if present	Yes
Polecat	Local, if present	Yes
Reptiles & Amphibians	Site, if present	No, but included in assessment due to legal status
Invertebrates	Site	No
Invasive Non-native Species	Site	No, but included in assessment due to legal status

Embedded Mitigation and Sources of Potential Ecological Impact

9.129 The Development is described within Chapter 3 of the ES, with outline construction methodology and phasing within Chapter 5.

9.130 The Assessment is made of impacts that might arise during the construction phase (which is anticipated to last approximately 9 months), the operational phase, which is 40 years, and the decommissioning phase.

Potential Sources of Impact

9.131 CIEEM guidance draws a necessary distinction in Ecological Impact Assessment between 'impacts' and 'effects'. An 'impact' is an action resulting in changes to an ecological feature, whereas an 'effect' is the outcome to an ecological feature from an impact. Impacts are discussed here while potential effects and relevant mitigation measures are discussed later in this chapter.

9.132 The following sources of ecological impacts are given here to provide context in the assessment of effects. The examples given are not exhaustive.

Construction Phase

9.133 Habitat Loss and Habitat Change: Limited habitat loss (for example at hedgerows) may occur where access for construction and operation is required where existing field accesses cannot be used or need to be widened. Other examples include clearance to facilitate any permanent hard standing such as foundations or footings, or temporary surfaces for compounds and jointing bays. Habitat change will principally be associated with the reversion of arable fields to grassland and other habitats through management, as well as habitat creation where valuable habitat creation opportunities are identified.

9.134 Killing and Injury: Habitat clearance and the actions of plant during construction has the potential to cause direct harm to species.

9.135 Fragmentation: Described by CIEEM as, "*The breaking up of a habitat, ecosystem or land-use type into smaller parcels with a consequent impairment of ecological function*". Potentially in combination with habitat loss and habitat change, fragmentation can reduce the function of a habitat as well as impede the ability of a species to disperse and maintain a viable population. Installation of fencing or culverting streams may also cause fragmentation, as well as through excessive light and noise disturbance.

9.136 Disturbance: Pressures or changes in the environment acting on individuals of a species so as to alter their behaviour may arise through noise, movement and vibration during construction operations, as well as increased human presence.

9.137 Pollution and Habitat Degradation: Release of chemical, sediment or dust pollution can interfere with the normal function of habitats and directly harm species, while processes such as erosion, compaction and alteration of soil/water chemical composition cause the degradation of habitat quality. The construction phase risks the release of pollutants through vehicle and plant movement/operation as well the introduction of new materials onto and into the soil. Protection of sensitive features will be important in safeguarding them throughout the life of the Development.

9.138 Habitat Creation and Enhancement: Beneficial effects are likely to arise from the creation of new woodland, grassland, hedgerow and wetland habitats on site, as well as the enhancement of retained habitats through development-free buffer zones and increased habitat connectivity. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs.

Operational Phase

9.139 Habitat Loss and Habitat Change: Significant impacts from these are not anticipated as operation will be largely benign, unless major unexpected maintenance or repair events are required. Ongoing habitat maintenance will seek to ensure favourable condition and enhancement of all newly created and retained habitat for the life of the scheme. Ecological monitoring will be key to realising this.

9.140 Killing and Injury: Routine operational works are unlikely to give rise to these effects although there is the risk of direct harm to species from the movement of vehicles around the site, or the trapping of certain species within the fencing or fenced area.

9.141 Fragmentation: The presence of a solar project is anticipated to be habituated to by most species, especially with the creation of new, and enhancement of retained, habitats. Typical perimeter fencing is not considered to impede the movement of most mammals, although movement of deer is likely to be impacted. Migrating birds and bats may interact with or be perturbed by the surfaces of the solar array so this will be considered in the assessment.

9.142 Disturbance: Operational disturbance may occur through the infrequent movement of maintenance vehicles and personnel on site, as well as the presence of low-level noise associated with electrical equipment. Light reflection may be another factor.

9.143 Pollution and Habitat Degradation: The risk of these impacts during operation are very low. Good maintenance practice will be key to avoid further pollution events or degradation of adjacent habitats.

9.144 Habitat Creation and Enhancement: Ecological benefits can be maximised through the implementation of a habitat management and monitoring scheme for the life of the development. Beneficial effects may also be derived from the cessation of cultivation, chemical treatments and soil inputs.

In-combination Impacts

9.145 The following sources of potential in-combination impacts will also be considered, where applicable, in the Assessment of Effects, below.

i. The combination of individual effects, for example, the combined effects of noise, dust and visual effects on a particular receptor;

ii. The combination of individual topics, for example, the combined effects of climate change on ground conditions; and

iii. The combination of different works of the Development on a particular receptor for example, the in-combination effects of the construction of the cable route and the energy storage at the same time.

9.146 Cumulative impacts, that is, the potential impacts arising from the combination of the Development and other known similar schemes (either under construction, in operation or in planning) is discussed from Section 9.252 with respect to the cumulative schemes described in Chapter 2 of the ES.

Design Elements with Embedded Mitigation

9.147 Embedded mitigation measures are those which aid the avoidance or reduction of impacts through the choices made in the design of the Development. Many of these embedded measures are laid out in an Outline Construction Environmental Management Plan (oCEMP) and a Landscape and Ecological Management Plan (oLEMP) prepared to accompany the application. These Outline documents are designed to set out the principles of impact avoidance and reduction and would be finalised as ‘CEMP’ and ‘LEMP’ respectively following consent and the confirmation of final details including responsibilities and timings. The measures contained within the documents would be secured by means of a planning condition which would be discharged upon approval of the final CEMP and LEMP by the Host Authority.

9.148 ‘Additional mitigation’ is the term used to describe further measures that are required to reduce specific identified impacts; these are detailed within the Assessment of Effects and will also be secured through their inclusion under the planning permission within documents such as the CEMP and LEMP, where appropriate.

9.149 Embedded mitigation measures inherent within the Development design comprise:

i. Buffers between field boundary habitats and the nearest array have been utilised according to a set of ecological importance criteria. Buffers are measured from the outer edge of the

hedgerow, root protection area of the tree canopy (in case of woodland or individual trees) or the banktop of the watercourse. Buffers over 5m may contain perimeter fencing or simple tracks for maintenance vehicle access, although this will only be where essential. Protected construction-phase fencing will also observe these buffer distances. The measurement criteria are as follows:

a. *10m from hedgerows and watercourses*

b. *10m from outlier badger setts*

c. *15m from woodland*

d. *30m from a subsidiary or main badger sett*

e. *Root Protection Area (RPA) or larger for mature trees*

ii. Access for construction of the Development and operational maintenance has been specifically designed to utilise existing field entrances and gaps in internal/external hedgerows and other linear habitats, wherever possible, to reduce the need to create new gaps in hedgerows or watercourse crossings as far as is reasonably practicable. A total of two new gaps measuring 6m each will be created and two existing field entrance gaps widened. The main site entrance will see 16m of hedgerow loss in order to facilitate the necessary highway visibility splays for road safety. The total hedgerow loss totals 40m.

iii. The perimeters of the array will be fenced for security purposes, and the base of the fencing material will be offset from the ground to allow passage of small mammals. Internal field boundaries (i.e. those which are only adjacent to developed land) will not be fenced, so as to aid the achievement of differing habitat management prescriptions within the buffers and the array areas. Habitats under operational arrays will be either managed through grazing or cutting. The proportion of grazing and cutting will be balanced so as to emphasise the ecological benefits that can arise from a sensitively-timed cutting regime. Grazing methods such as pulse-grazing, aftermath grazing and conservation grazing can also be employed. Habitat under the arrays and within buffers, easements and other designated ecological mitigation areas have each received habitat creation and management prescriptions in order to provide a Net Benefit for Biodiversity (NBB), and contribute to policy-led green infrastructure and Nature Recovery Network principles. The rationale for all mitigation is set out in this Chapter and all such enhancements will be further detailed within the LEMP. Prescriptions include substantial new hedgerow and tree planting, reinforcement planting at existing hedgerows and field boundaries, extensive grassland habitat creation and sympathetic management both within buffers and under the arrays, as well as discrete, valuable habitat creation (e.g. meadow, orchard and woodland) away from the panels. Although not a requirement in Wales, a Biodiversity Net Gain (BNG) assessment has been undertaken for the Development to quantify the biodiversity benefits that will arise as a result of the Development and can be found in Appendix 9.9.

iv. Construction-phase lighting is anticipated to be minimal and only used where required in the winter months where normal working hours coincide with the hours of darkness.

v. Operation of the Development will require minimal intervention and, as such, levels of disturbance (light, noise and human presence) upon wildlife within the Site will be minimal and likely lower than at present. Operational lighting will only be necessary during periodic maintenance activities during the hours of darkness.

Construction Environmental Management Plan

9.150 An Outline Construction Environmental Management Plan (OCEMP) has been produced to support the Environmental Statement (Appendix 5.1 refers). Through the discharge of a planning condition, a detailed version of the CEMP will need to be approved by the relevant local authority which must be substantially in accordance with the OCEMP. The OCEMP summarises the measures and approaches to be adopted which will limit the likelihood of impacts occurring upon retained habitats through damage, pollution and disturbance during the construction phase in order to enact the mitigation requirements set out in this Chapter. The document will apply to all aspects of the construction phase, including cable installation, energy storage and solar array construction. The OCEMP contains (among others) the following measures:

i. Criteria under which an Ecological Clerk of Works (ECoW) would be required in order to oversee certain construction activities which have the potential to impact on protected species, such as localised habitat clearance, ditch/watercourse engineering works. These criteria would trigger the need for ECoW attendance and, potentially, pre-commencement surveys or preparation by an ecologist, as well as follow-up monitoring or reporting.

ii. Criteria under which certain potentially impactful operations would need to be restricted to particular months or seasons in order to lessen likely adverse ecological impacts. For example, hibernation or nesting season for particular species.

iii. Details of task-specific Method Statements for potentially ecologically impactful construction works as identified in this Chapter.

iv. Detail on the location and specification of temporary and permanent protective fencing to be installed prior to the onset of construction. The buffer zones specified in this chapter will drive these locations.

v. Restrictions on the use of fuels and other contaminants in proximity to boundary features and other sensitive habitats.

vi. Measures to limit the dust generating activities, such as when working in dry conditions.

vii. Measures to limit the mobilisation of sediments and run-off, such as when working in very wet conditions or the use of silt fencing when working in ditches.

viii. Construction personnel will receive a Toolbox Talk detailing the presence of sensitive ecological features at or close to the Sites and will be informed that no materials should be stored, or vehicles drive, through buffer zones.

Landscape and Environmental Management Plan

9.151 Objectives and principles for habitat creation are set out within an Outline Landscape and Ecological Management Plan (OLEMP) (Appendix 7.9 refers). This will include draft Method Statements and diaries, as well as draft details of personnel and organisations responsible for its delivery. It is anticipated that the mitigation set out within the Landscape Strategy Plan and detailed in the OLEMP will be secured by condition attached to an eventual planning consent. This condition is anticipated to require a detailed version of the LEMP to be approved by the relevant local authority which must be substantially in accordance with the OLEMP. The OLEMP summarises the principles which will be followed within the design of mitigation and enhancement for landscape and ecology. It sets out the location, objectives and methods for mitigation and habitat creation across the Development, such as for hedgerows, trees and grassland, specified as part of this Chapter. As such, the OLEMP contains detail of both embedded mitigation prescriptions as well as any additional mitigation not already embedded within the design required to reduce specific identified impacts. The Outline LEMP also provides details on the ongoing management of these habitats for the duration of the Scheme as well as ecological monitoring requirements in order to ensure mitigation and habitat creation objectives are met and remedial measures can be undertaken as necessary. Habitat creation within the LEMP, whether considered embedded mitigation, additional mitigation or ecological enhancement (as explained in the following impact

assessment and reported within the BNG assessment) includes the following approximate lengths and areas[1]:

i. 1.44km of newly planted native hedgerow with native trees.

ii. 1.77ha of native shelter belt/woodland.

iii. 0.083ha of native orchard planting.

iv. 10.53ha of new grassland outside perimeter fence allowed to develop into a taller sward with tussocks.

v. 3.67ha of existing grassland at field margins allowed to develop into a tussocky sward.

vi. 7.79ha of flower-rich pollinator seeding at field margins and easements.

vii. 38.76ha of low maintenance grassland within development footprint.

9.152 A proposed Landscape Strategy Plan (ES Chapter 7, LN-LP-13_A, Figure 7.12), which sets out the locations for habitat creation across the Development.

Assessment of Effects

9.153 This section identifies and characterises construction and operation phase impacts on each Important Ecological Feature of the Development considered possible according to baseline data and Development designs. When characterising impacts, embedded mitigation measures which form part of the scheme design and avoid or mitigate for these impacts are taken into account. Any additional mitigation required to reduce these impacts is set out. Thereafter, an assessment is made of the significance of any residual effects after all mitigation measures have been factored in. Ecological enhancements which will be adopted are also outlined.

Designated Sites

Pembrokeshire Marine SAC, Milford Haven Waterway SSSI, Pembroke Mill Ponds LNR and WTR

9.154 The SAC is located to the northeast of the Site, beginning at the estuary of the Pembroke River. The stream that bisects the Site was identified as flowing north and east, where it eventually feeds into Pembroke River and the Mill Ponds (LNR and WTR) in the centre of Pembroke. The estuarine channel of the Pembroke River forms part of the Pembrokeshire Marine SAC with Milford Haven Waterway SSSI further upstream.

Construction Phase Impacts

9.155 There is a low possibility of pollution events impacting the designated sites due to this hydrological link. Sediments or contaminants may be discharged accidentally into watercourses during construction, for example. These potential impacts would be considered to be minor in severity and temporary, reversible in the medium and long term. However, the OCEMP contains standard pollution prevention methods embedded into the design of the Development, such as the protection of boundary features through exclusion fencing, restrictions on working within proximity to watercourses during times of drought or heavy rain, the safe storage of chemicals and refuelling of vehicles, the periodic inspection of works by an Ecological Clerk of Works and the placement of spill kits and flood barriers within the site. These measures would be further detailed in the finalised CEMP and secured through planning condition. Taken together, it is considered that these measures would mean that **no significant effects** are likely to occur on the SAC during construction, and therefore no additional mitigation is considered necessary.

[1] It should be noted that these figures are based on current layout and landscaping proposals, which may be subject to change pending final development specifications.

Operational Phase Impacts

9.156 During the operational phase, it is considered unlikely that any impacts on these sites, such as contamination or sediment mobilisation, would occur owing to the limited maintenance activities (likely very occasional movements of one or two small vehicles) expected to take place during the operational phase. Due to the lack of identified impacts during operation, **no significant effects** are considered likely to occur at the SAC during operation, and therefore no additional mitigation is considered necessary.

Bristol Channel Approaches SAC

9.157 The Site itself offers no functionally-linked habitats to those cited within the SAC designation, which is designated for its marine habitats and associated harbour porpoise. As such, this SAC is considered to be beyond the Zone of Influence of the proposals and, therefore, no impacts upon it from the construction or operational phases of the Development are likely to occur.

Pembrokeshire Bat Sites and Bosherston Lake SAC

9.158 The SAC covers a series of lily ponds to the southwest of the Site, along with eight SSSI components (Stackpole SSSI, Stackpole Courtyard Flats and Walled Garden SSSI, Slebech Stable Yard Loft, Cellars and Tunnels SSSI, Felin Llwyn-gwair SSSI, Carew Castle SSSI, Beech Cottage Waterwynch SSSI, Orielton Stable Block and Cellars SSSI, Park House Outbuildings SSSI). Greater and lesser horseshoe bats are among at least ten species of bat utilising the surrounding woodland and swampy lakeside margins of these sites as feeding flyways connected to important the summer, winter and intermediate roost sites provided by the SSSIs. Otters are resident within and around the lake margins and have at least one breeding holt. The lake system is a stronghold for this species. As indicated in the Baseline Conditions, the watercourses on Site are not hydrologically linked to the Bosherston lake system. Furthermore, Alleston Wood represents a small remnant woodland in declining condition in the context of the wider landscape, which is separated by extensive farmland from the designated sites, with more suitable habitat in-between. While species associated with this SAC were recorded within the Site, the Site itself represents suboptimal habitat for bats and for otter, as set out in the Baseline Conditions section, above.

9.159 The Site lies outside of the Core Sustenance Zones (CSZ) for horseshoe bats (up to 3km).

Construction Phase Impacts

9.160 Night-time working will not be required during the construction phase, with the exception of occasionally during winter months due to shorter daytime hours. However, bats are likely to be in hibernation at this time, and any lighting will be isolated to where people will be working and will not be left on overnight. Disturbance impacts resulting from light will therefore not occur.

9.161 Given a lack of a hydrological link between the Development and the Bosherston Lake system, pollution or degradation effects are highly unlikely to occur.

9.162 Accidental damage to trees, which may contain roosts, and removal of minor amounts of foraging habitat could have a minor impact (reversible in the medium-long term) on the bat species within the SAC and SSSIs. As such, embedded mitigation to minimise the risk of such events is given in the OCEMP and will be secured by planning condition, with measures including the installation of protective fencing and buffer zones, tree protection fencing and the regular site inspections by an Ecological Clerk of Works. Consequently, it is anticipated that the **no significant effects** on the SAC during the construction are likely, and therefore no additional mitigation is considered necessary.

Operational Phase Impacts

9.163 During the operational phase, it is considered unlikely that any impacts on the SAC, such as further habitat removal or damage, would occur owing to the limited maintenance activities (likely very occasional movements of one or two small vehicles) expected to take place during the operational phase. Therefore, due to the lack of identified impacts during operation, **no significant effects** are considered likely to occur at the SAC during operation, and no additional mitigation is considered necessary.

Castlemartin Coast SPA

9.164 This site is designated for its breeding population of choughs, which are associated with marine and intertidal habitats and farmland. These birds were not recorded within or adjacent to the Site during a suite of bird surveys and is unlikely to provide suitable habitat for the species. Although within the range of UK chough populations, the Site does not offer suitable breeding sites, such as coastal caves or quarry tunnels, for example, nor does it offer extensive grazing pasture for foraging. It is possible that choughs associated with the SPA may move through the landscape in low numbers, but the Site is unlikely to support any viable populations. The SPA is therefore considered to be beyond the Zone of Influence of the proposals and no impacts upon it from the construction or operational phases of the Development are likely to occur.

Freshwater East Cliffs to Shrinkle Haven SSSI, Stackpole Quay to Trewent Point SSSI, Stackpole NNR, Freshwater East LNR

9.165 Despite the close proximity of the Site to these designated sites (1.2km to 4km), a hydrological link between them is not apparent from an examination of local mapping. The watercourses on Site were observed to flow north and west toward Pembroke and no connecting channels between the Site and the southern Pembrokeshire coastline were identified.

9.166 The Site itself offers no functionally linked habitats to those cited within the SAC designation, which is designated for its marine habitats and associated harbour porpoise, or the SSSI, NNR and LNR designations, which were designated for their diverse coastal dune systems and cliff habitats. As such, these designated sites are considered to be beyond the Zone of Influence of the proposals and, therefore, no impacts upon it from the construction or operational phases of the Development are likely to occur.

Habitats

Woodland and Scrub

Construction Phase Impacts

9.167 No loss of woodland is anticipated in relation to the construction phase of the Development, as all access and construction activity will avoid the few woodland habitats which occur adjacent to the Development footprint. A very minor, permanent loss of scrub (c.0.01ha) is likely in order to facilitate vehicular access during the construction phase and is not significant enough to require mitigation.

9.168 Woodland in close proximity to the Site and haul routes would remain sensitive to degradation through accidental pollution events, dust deposition and vehicle over-run (where woodland exists close to roads on the haul routes). However, embedded mitigation to minimise the risk of such events is given in the CEMP, to be secured by condition, and includes the installation of protective fencing and buffer zones, and the regular site inspections by an Ecological Clerk of Works. A protective, development-free buffer of 15m from Alleston Wood has been designed into the Development and will be demarcated by protective fencing prior to commencement of construction so that accidental damage can be avoided. The buffer distance would be observed for the life of the Development thereafter.

9.169 Construction activities could lead to a small amount of noise disturbance to the species within the woodland. However, this would be temporary and would only affect the margins of the woodland. It should be noted that a certain amount of noise disturbance, dust deposition and run off would be anticipated as a result of routine agricultural activities (‘do nothing’ scenario), and as such impacts are likely to be similar to the current baseline conditions.

9.170 With the enaction of embedded mitigation measures via the CEMP, **no significant effects** on woodland and scrub during construction are considered likely, and therefore no additional mitigation is considered necessary.

Operational Phase Impacts

9.171 Due to the largely passive nature of the operational Development, impacts on woodland are not anticipated. All woodland edge habitat will be retained and protected. Woodland management is not

anticipated to be necessary, although periodic pruning or trimming back of self-seeded boundary vegetation will be required to keep the arrays and maintenance tracks clear of tall, woody vegetation.

9.172 Maintenance visits by a small number of personnel at regular intervals will be required, although movement of vehicles close to the woodland edges is not anticipated during operation of the array due to the imposition of sufficient protected buffer zones and the restriction of vehicles to demarcated tracks.

9.173 Woodland habitats are currently subject to spray drift following intensive arable farming practices, from the use of herbicides and potentially pesticides. The cessation of these processes is likely to be of benefit to the woodland habitat edges during the life span of the Development, encouraging the proliferation of woodland ground flora.

9.174 As **no significant adverse effects** on woodland and scrub during operation are considered likely, and no additional mitigation is considered necessary.

9.175 The cessation of agricultural practices and associated chemical spray drift may bring about a **beneficial effect significant at Site level** when the overall health of the woodland ecosystem is considered**.**

Ecological Enhancement

9.176 1.77ha of new woodland is proposed within the Development over at least six blocks, with an additional 0.08ha of orchard planting. This would contribute to the proliferation of Green Infrastructure and connectivity of habitats across the Site. All new areas of planting are detailed within the LEMP along with appropriate planting schedule, and monitoring programme. The maturation of this planting is anticipated to give rise to a **beneficial effect significant at Local level**, considering the relatively low prevalence of woodland coverage in the local area.

Hedgerows and Trees

Construction Phase Impacts

9.177 The potential for loss of hedgerows to the construction of the Development is very limited as the design process has continuously sought to refine down the number of new crossings or gaps required in existing field boundaries. The schedule of new gaps required for the construction and ongoing maintenance totals two (measuring 6m each), while seven existing gaps (field gateways) will be widened slightly (by 2-4m). The main site entrance will see 16m of hedgerow loss in order to facilitate the necessary highway visibility splays for road safety. The total hedgerow loss totals 40m. In the context of the Site's hedgerow network, which comprises approximately 8.15km, such losses are very minor (less than 1%) will be permanent. This impact is considered to give rise to an **adverse effect significant at a Site level.**

9.178 Careful design of the Development has ensured that individual trees sited within fields are not at risk of fragmentation and degradation impacts from being surrounded by the array structures, which may reduce their wildlife value. Further protective measures employed and set out in the OCEMP comprise the protective fencing of hedgerows, infield trees and woodland, avoiding working in extremely dry/wet weather, the responsible storage and use of fuels/chemicals and the movement of vehicles and plant in line with the approved plans to help avoid any accidental damage or degradation during the construction phase. Furthermore, an Ecological Clerk of Works will oversee all necessary hedgerow habitat clearance work associated with the array construction. The ECoW will ensure that all protective measures are followed, and that all necessary measures to avoid impacts on nesting birds and other wildlife are carried out.

9.179 No mature trees are anticipated to be lost to facilitate the Development. Immature trees within hedgerows may be present at the locations of proposed new gaps, but the ecological value of these is considered to be relatively low, therefore in the event that any such trees are impacted, an **adverse effect** would likely be **significant at Site level only** and would not require additional mitigation**.**

Construction Phase Additional Mitigation Measures and Residual Effects

9.180 Mitigation will be undertaken through the planting of 1.44km of new hedgerow, along with its ongoing maintenance, which will more than outweigh these impacts in the medium to long term. It is considered

that 40m of this quantity of planted hedgerow will act as direct mitigation, whereas the remainder can be considered enhancement (as given below). This mitigation would be secured by the LEMP through a combination of planting during the end of the construction phase and the maturation of the new habitats over the operational phase. As a result, the above adverse effects would be reduced to at least **neutral** levels, leaving **no residual construction phase effects.** It is considered that the large degree of new planting should predominantly be treated as an ecological enhancement, which is discussed below.

Operational Phase Impacts

9.181 As with woodlands, the largely passive nature of the operational Development means that impacts on hedgerows and trees are not anticipated, especially considering all Development-free buffers to be observed. Management regimes applied to the hedgerows will include periodic pruning or trimming back of self-seeded boundary vegetation in order to keep the arrays and maintenance tracks clear of tall, woody vegetation and to avoid undue encroachment into neighbouring grassland habitat management areas.

9.182 Where hedgerows are present that pose no risk of shading to the panels, these will be allowed to mature, and trees therein will be allowed to reach standard height.

9.183 A protective development-free buffer of between at least 5m from all hedgerows and trees (more where mature trees require a Root Protection Area (RPA) to be observed) has been designed into the Development, and secured through the CEMP and LEMP, to be installed during the construction phase and observed for the life of the Development thereafter.

9.184 The cessation of intensive arable farming and use of herbicides and fertilisers is likely to be of benefit to the hedgerows and trees during the life span of the Development, encouraging the diversification of hedgerow ground flora.

9.185 Soft landscaping proposals will allow for individual in-field trees to be more functionally connected through the planting of woodland belt along the northern site boundary and seeding of diverse grassland, for example.

9.186 For the operational phase, it is considered likely that a **beneficial residual effect** which is significant at a **Site** level on hedgerows and trees will result from the sympathetic management of retained hedgerows and trees in the medium-to-long term. This is secured through the approval of a detailed LEMP to discharge the relevant planning condition.

Enhancement Measures

9.187 Significant enhancement through the planting of new hedgerows at boundaries is proposed and outlined within the LEMP and Landscape Strategy Plan, and focuses on the gapping up of existing hedgerows, creation of new hedgerows (approximately 1.4km) at boundaries where none exist, and planting around Public Rights of Way and where landscape and visual impact mitigation is required. This planting will also more than compensate for the minor loss of hedgerow habitat resulting from the small number of new construction access gaps.

9.188 Additionally, approximately 0.08ha of orchard planting is proposed, which will be sensitively managed without the use of chemicals or fertilisers to provide habitat and foraging resources for a range of wildlife.

9.189 Management measures committed to within the LEMP will aim to maximise the biodiversity value of retained and planted hedgerows in the long term. This includes the rotational cutting of the hedgerows to ensure a diversity of habitats on the Site each year, and the maintenance of hedgerows at a minimum height of 2m as this has been demonstrated to be important for promoting hedgerow biodiversity value.

9.190 Taken together, these new habitat creation measures, secured by the LEMP, are considered likely to **increase the beneficial residual effect significance** to the **Local** level.

Watercourses and Ditches

Construction Phase Impacts

9.191 The Development will avoid and minimise direct impacts upon ditches by utilising existing crossings for access wherever possible as a result of an iterative refinement process. No crossing of, or incursion into, significant streams will be necessary for construction or maintenance access the array.

9.192 In order to facilitate construction access, a single existing concrete bridge which crosses the stream between Fields 2 and 6 may require reinforcement. It is not known at this time whether there would be an incursion into the bed or further incursion into the upstream or downstream banks of the ditch. Should any incursion into the stream, an ecological survey will be required prior to works to inform impacts. Furthermore, an Ecological Clerk of Works will oversee this work and will ensure that all precautionary and protective working methods set out within the CEMP are followed, and that all necessary measures to avoid impacts on wildlife are carried out. Any necessary habitat restoration (such as over-sowing or planting) will also be specified. The ECoW will also be tasked with monitoring the success of all replacement planting and organising remedial action, where necessary.

9.193 Without the implementation of protective buffer zones, there is a risk that the existing habitat may be damaged or degraded through direct construction damage or indirect impacts such as the release of sediments or dust, which could flow into connected watercourses off-site. Accidental pollution events are considered unlikely, but if they were to occur they would potentially have a detrimental effect on the quality of habitats on Site and downstream beyond the Site in the short-to medium-term depending on severity. In order to avoid these impacts, the Development has been designed to implement buffer zones during construction that are free of development at least 10m from every watercourse as previously described. This and further protective measures to minimise accidental pollution or sediment mobilisation are set out in the OCEMP and will be secured by planning condition.

9.194 Taken together, the mitigation measures embedded into the Development design and secured by a conditioned CEMP will ensure that **no significant effects** on watercourses during construction are likely, and that no additional mitigation is required.

9.195 It should also be noted that a certain amount of dust deposition and run-off would be anticipated as a result of routine annual agricultural activities and, as such, effects are likely to be no worse than the current baseline conditions.

Operational Phase Impacts

9.196 Water quality can be expected to increase post-development due to the anticipated reversion to permanent grassland under the array (reduced sediment run-off) and cessation of application of fertilisers and herbicides. This is expected to give rise to an attendant improvement in water quality. This is considered to bring about a positive effect on watercourses, although this will likely take 1-5years to be fully felt.

9.197 The sympathetic management of field margin habitats can be expected to benefit to a minor or moderate degree the biodiversity value of the stream network through the proliferation of marginal wetland species following a reduction in disturbance resulting from agricultural activities, and from agricultural inputs.

9.198 The risk of ongoing pollution or damage from routine maintenance operations is minimal given the general restriction of vehicle movements to made-up tracks and the imposition of development-free buffer zones between hardware and stream habitats.

9.199 Consequently, an overall **beneficial residual effect** during the operational phase is expected, being significant at **Local level.**

Species

Bats

Construction Phase Impacts

9.200 The hedgerows, watercourses and adjacent woodland edges were considered to be the habitats of highest value for foraging and commuting bats on within the Development.

9.201 While the existing field accesses will be utilised in the vast majority of cases, losses of short sections of hedgerow will be unavoidable in a small number of cases (two, with eight existing gaps to be widened, totalling 40m of hedgerow loss overall). This creation of new or wider gaps is considered to be proportionately very minor in terms of the overall hedgerow network and unlikely to significantly fragment foraging or commuting routes. Furthermore, no trees will be removed in this process, thereby safeguarding any potential tree roosts. Bat species recorded within the Site are considered able to overcome hedgerow gaps typical of agricultural access gaps in hedgerows, as currently exist, when dispersing. It is considered that this low number of new gaps would be unlikely to have an impact upon the local or wider conservation status of the bat assemblage present within the Site and so this impact is likely to be **significant at a Site level only**.

9.202 Other areas of habitat of value to foraging bats, in the form of uncultivated field margins or semi-improved and improved grassland and scrub, may be impacted during construction through the movement of plant and machinery, excavation or array installation. Such impacts would be considered temporary and short-term, being progressive across the development area and followed by habitat creation or management works thereafter. No significant loss of access to foraging habitat is therefore anticipated as a result and so this impact is likely to be **neutral**.

9.203 Accidental damage or pollution events during construction could degrade the hedgerow and watercourse network leading to localised, temporary adverse reductions in habitat quality for foraging and commuting bats. Although a specific survey was not undertaken, many trees with bat roosting potential were observed on Site within hedgerows, in-field and adjacent woodland edges. Any accidental harm to or loss of mature trees, which are capable of supporting roosting bats, could result in direct harm, population fragmentation and habitat degradation. Construction activities such as heavy vehicle movement or piling could cause disturbance through noise and vibration if undertaken in proximity to potential roost trees. In order to avoid these impacts, the Development has been designed to implement buffer zones during construction (and operation) that are free of development at least 5m from every field boundary (although mostly 10m, and at least the RPZ of all trees) as previously described. This and further protective measures to minimise accidental pollution or sediment mobilisation are set out in the OCEMP and will be detailed within the CEMP which would be secured by planning condition. Taken together, the embedded mitigation measures secured by a conditioned CEMP will ensure that this potential impact will lead to **no significant effects** and that no additional mitigation is required.

9.204 No artificial construction lighting is anticipated to be required outside of the winter months. During winter, artificial lighting may be required within the construction zone due to the short day lengths. If this is the case, light may spill onto hedgerows. It is understood that the construction phase would be progressive, working on one field, or a small number of fields, after another, rather than across all fields at the same time, thereby lessening potential impacts. Should any lighting be required during the construction phase, all luminaires used during construction or installed for the operation of the Development will be downward directional so as to avoid upward light spill. This would be stipulated within an eventual CEMP. Furthermore, as bats are in hibernation during the winter months, and only active occasionally for short periods, they are unlikely to be significantly affected. Therefore, embedded mitigation measures avoid potential fragmentation of habitat as a result of light pollution.

Construction Phase Additional Mitigation Measures and Residual Effects

9.205 No mature or semi-mature trees will be lost to facilitate the development. However, and as an additional precaution, if any tree removal is later found to be unavoidable the tree will be investigated closely through an aerial close inspection and the use of video endoscopes to determine the presence or likely absence of any bat roosts. The loss of any roost will need to be covered under a licence from Natural Resource

Wales, but all alternatives will be explored beforehand. This measure will be secured by inclusion within the CEMP.

9.206 The planting of new trees, hedgerows, and the management of diverse grasslands (secured through the LEMP) will more than offset the potential minor impacts of loss of foraging, commuting and roosting habitat given above, thereby reducing residual effects to **neutral levels.**

Operational Phase Impacts

9.207 The effects of the installation of solar panels on bat activity and the activity of their prey is largely unknown, as highlighted by Natural England in their 2016 evidence review of the impact of solar farms on birds, bats and general ecology[v]. This is also considered relevant to solar development in Wales. However, a more recent study into this concluded no significant differences in bat abundance between the centre and edges of fields containing solar arrays[vi]. Some concern has previously been raised that the presence of solar panels may have negative impacts on bats when echolocating, for instance by confusing solar panels for waterbodies, from which bats both glean insects and drink. Studies[vii] into this potential impact do not suggest that collision is likely, or that detrimental impacts on bat populations would arise from mistaking panel surfaces for water. There is also a lack of evidence in the current body of research literature to infer solar arrays have a beneficial impact on foraging bats (for instance, Tinsley et al. (2023)[viii] and corresponding response in review article by BSG (2024)[ix]). In the absence of major studies into the effects of solar installation on bat behaviour or populations, it is prudent to assess the potential impacts of solar developments on bats in the context of the Site's habitats, landscape setting and survey results. The Site's suitability to bats is generally limited to the mature hedgerow network and the woodland belt through the centre, which provides connectivity to the wider landscape, and potentially with the designated sites identified within the desk study. The Site's arable and intensive pasture grassland are of lower value to foraging or commuting bats. During the operational phase of the proposed solar arrays, the embedded cessation of arable farming practices and reversion of land to permanent (for the lifespan of the Development) grassland can be expected to result in an increase in the abundance and diversity of invertebrate prey thereby serving to offset potential, as yet unquantifiable, impacts. This present uncertainty over how bats use solar arrays is another reason why buffers of at least 5m (and in many cases more than 10m) from field boundaries are proposed as embedded mitigation. However, as a precautionary assessment, it is considered that impacts on bat foraging and commuting activity at the Site would be **Significant** at a **Local level**.

9.208 External lighting will only be installed at substations, and not within the arrays, which will only be used as necessary during maintenance work or security events. Consequently, embedded mitigation will ensure there will be **no significant effects** on bats as a result of operational lighting.

9.209 The adoption of embedded development-free buffers at field boundaries from the onset of construction (protective fencing) through the operational lifespan of the Development will avoid the potential for disturbance impacts upon any roosts present in trees, as well as the potential for accidental damage or pollution events during maintenance operations. Consequently, **no significant effects** from such potential disturbance or damage are anticipated.

Operational Phase Additional Mitigation Measures and Residual Effects

9.210 The precautionary approach to assessing impacts of solar arrays on bat foraging and commuting activity assumes that bat activity will be reduced directly over solar panels. In addition to buffers from field boundaries, the extensive undeveloped areas associated with easements, new grassland, tree and woodland habitat planting as well as grassland enhancement will ensure a relatively large area of land is maintained and enhanced outside of solar array footprints but within the site boundary. This would represent highly suitable foraging habitat for the assemblage of bats species using the Site currently and help to ensure a permeable and functioning landscape is retained for the existing populations throughout the lifespan of the Development. Further beneficial effects are considered likely to arise from the increased capacity of the newly-sown and managed grasslands and other herb-rich habitats to support flying invertebrates compared to arable. These habitats will be present across the majority of the Site, under panels and within buffers and easements as well as fields not proposed to receive PV infrastructure. This would have the effect of improving the abundance, diversity and productivity of foraging resources. All such habitat management and enhancement would be secured through the finalisation of the LEMP, to be secured by planning condition. Consequently, it is predicted that this additional landscape and habitat

mitigation would reduce adverse impacts substantially, resulting in a residual effect on commuting and foraging bats which would be instead **significant at the Site level**.

Ecological Enhancements

9.211 The installation of new bespoke tree-mounted bat roosting features will be included within a LEMP and will provide a large number of roosting opportunities over the total area of the Development. Further to this, at least one structure, suitable for use for night-roosting by horseshoe bats will be constructed within the undeveloped field buffers.

9.212 Consequently, with the securing of the LEMP in full, a **positive effect** which is **significant** at a **Local** level, over and above the residual effect described above, is considered likely to occur.

Breeding Birds

9.213 32 conservation priority bird species were observed during the surveys and could nest either in the hedgerows, trees, woodland edges and arable field margins, or within the arable fields themselves. Taking into consideration their relative abundance on Site as well as their conservation status, species of some elevated concern were skylark, meadow pipit, dunnock, wren, linnet, song thrush and rook, which were all evaluated as being of **Local Importance.** All other species were considered to be of **Site Importance.** No Schedule 1 species were considered likely to nest within the Site.

Construction Phase Impacts

9.214 Nesting sites of all birds are capable of being harmed by certain habitat clearance activities either associated with activities to facilitate access onto the array Site or, in the case of ground-nesting species, installation of the solar array itself. Dunnock, wren and linnet (among others) are at risk of killing, injury or nest destruction during the very limited hedgerow removal activities where new access gaps are required. Accidental damage to nesting habitat, or degradation through pollution events would be avoided through the adoption of protective buffer zones from the onset of construction. Minor losses of hedgerow habitat at the array sites are not considered to cause a cumulative impact on the birds which use them as losses are limited to 2-6m lengths and represent a fraction of the total hedgerow network available. The OCEMP details nest avoidance precautions to be taken during the construction phase. These will comprise measures such as seasonally timed working, the presence of an Ecological Clerk of Works and the setting up of exclusion zones around nesting sites should any be identified during operations. The protective measures during construction as secured through the CEMP will ensure that potential negative effects can be reduced to **neutral, non-significant** levels.

Operational Phase Impacts

9.215 As no further habitat loss after construction will occur, the species recorded within the survey area considered most vulnerable to habitat loss and change are the ground-nesting species of open habitats, principally meadow pipit and skylark, as they almost exclusively nest towards the centre of fields and require long, unbroken sightlines for predator avoidance. These species can be expected to be largely displaced from the Site for the duration of the operational phase. Up to four skylark territories were considered likely to be held within the southernmost field of the Site (F11), with no others being held elsewhere. Up to three meadow pipit territories were considered likely to be held across fields 9-11. These are considered to be low numbers of territories, largely as a result of the presence of tall trees and woodland at field boundaries and the undulating terrain of the Site. The displacement of this number of territories for either species is considered to be a **significant negative impact felt only at Site level**, given the UK population of 1.6million territories for skylark and 2.5million pairs for meadow pipit (BTO data) and the abundance of similar farmland habitat in the local area.

Operational Phase Additional Mitigation Measures and Residual Effects

9.216 A recent review of scientific literature and ecological monitoring studies[x] indicated that, while displacement effects on ground nesting birds are highly likely, the presence of solar farms confers a substantial benefit in terms of chick survivorship onto territories of ground nesting birds present off-site, but in close proximity to, a solar array via the provision of higher-quality foraging habitat in the form of diverse permanent (non-cultivated) grassland. Consequently, with the presence of suitable ground nesting habitat for these

species present on adjacent land, this impact is likely to be at least partially mitigated for through the provision of enhanced foraging habitat within the Development area. It is likely that **no significant residual effects** from this impact would therefore occur as a result of the Development.

Ecological Enhancement

9.217 The Landscape Strategy Plan and OLEMP contain details of the extensive additional planting of new hedgerows, trees and other woody vegetation across the Site boundaries which will increase nesting and foraging opportunities for numerous bird species. Similarly, additional nesting opportunities for birds will be secured via installation of numerous bird boxes within retained habitats and trees. Consequently, such benefits are likely to be **significant at a Local level**.

Overwintering Birds

Construction Phase Impacts

9.218 The onset of construction within a given field, or the movement of vehicles or personnel into undeveloped fields, risks the disturbance and flushing of birds at a time of year where they are most susceptible to energetic stress. However, the Site was not seen to regularly support significant flocks of such species, but rather act as an 'option' within a large network of similar habitat in the landscape. Consequently, this impact is likely to be **significant at a Site level.**

Construction Phase Additional Mitigation Measures and Residual Effects

9.219 As additional mitigation, work during the winter months will seek to minimise potential impacts on flocks of overwintering birds by avoiding entering undeveloped fields unless it can be confirmed that they do not contain flocks of waders or wildfowl, so as to avoid unnecessary energy expenditure at a sensitive time of year. An Ecological Clerk or Works will be appointed to carry out these checks. This measure would be included within the CEMP, to be secured by planning condition, and so reduce impacts on flocks of wintering birds to **neutral levels**.

Operational Phase Impacts

9.220 The operation of the arrays would mean that the Site is effectively removed as an option for foraging and shelter for small numbers of individual snipe during winter. As a proportion of the suitable habitat for snipe in the local area, it is relatively small. Consequently, this impact is **not considered to be more significant than at Site level**.

9.221 It is likely that flocks of other birds observed overwintering at the Site such as starling, skylark, meadow pipit and fieldfare would continue to forage within the grassland beneath panels and in fields retained in arable production, and be largely unaffected as a result.

Operational Phase Additional Mitigation Measures and Residual Effects

9.222 Landscaping proposals comprise the creation of diverse grassland fields, wide field margins and hedgerow planting, with their management set out in the LEMP to be secured by planning condition. In combination with the two fields kept in arable production, the Site is anticipated to retain a substantial proportion of suitability for use by a range of overwintering birds in the long-term. It is not proposed for any specific mitigation for the removal of the Site from the overall expanse of foraging habitat within the local landscape, although this residual impact is **not considered to be significant beyond Site level**, considering the extent of suitable land in the local landscape, including for snipe.

Dormouse

9.223 While the presence of dormice is known in the county, distribution in Pembrokeshire is sparse. Suitable habitat for the species exists in the form of hedgerow and woodland edges, and dormice stand to be adversely affected by direct impacts where hedgerow lengths are removed to create or widen accesses, and indirect impacts resulting from dust deposition, for example.

Construction Phase Impacts

9.224 The Development has been designed so as to keep the removal of habitat suitable for use by dormouse to an absolute minimum, through the near wholesale retention of the Site's hedgerow network. Furthermore, the embedded buffer zones will safeguard the vast majority of potential dormouse habitat from damage and prevent direct harm to dormice during construction. The exception to this is the removal of a total of 40m of hedgerow across ten sections to facilitate access routes and perimeter fencing. No access point will be greater than 6m wide, which is similar to existing farm accesses and is not considered to be a significant barrier to dormouse movement across the Site. Consequently, a small potential for direct harm remains during access clearance activities. In the absence of a precautionary approach to works for dormice, **this impact is considered to be significant at Site level**.

Construction Phase Additional Mitigation Measures and Residual Effects

9.225 By means of additional mitigation, a precautionary method of working in relation to the removal of hedgerow and tree habitat suitable for dormice in order to facilitate site access will form part of the CEMP. This will involve an Ecological Clerk of Works (ECoW) to oversee all necessary hedgerow habitat clearance work associated with the array construction. The ECoW will ensure that all necessary mitigation is followed, that all necessary measures to avoid impacts on dormice are carried out, which will include the sensitive timing of works to avoid hibernation, hand searching for nests and the methodical use of hand tools during this work as opposed to large machinery.

9.226 Significant lengths of new hedgerow planting is proposed, along with orchard and woodland planting, well in excess of the extent of suitable habitat that will be lost, which will be specified within the LEMP to be secured by planning condition.

9.227 The favourable management of the buffer zones for the duration of the Development as specified in the LEMP will ensure that the habitat quality of the hedgerows will be maintained and potentially enhanced in the medium- to long-term.

9.228 Taking into account all proposed mitigation, construction phase residual effects upon dormice are considered to be **neutral** and **not significant**.

Operational Phase Impacts

9.229 Impacts on dormice during the operation of the Development are likely to be minimal, considering the adoption of ecological buffer zones and the restriction of development and vehicle movement to outside of these, save for habitat management operations.

9.230 As additional mitigation for dormice is not considered necessary during operation, **no residual effects are considered likely.**

Ecological Enhancement

9.231 Due to the extensive planting of habitat suitable for dormice, in combination with the favourable management of new and existing hedgerows and wider buffer zones, a **positive** effect **significant** at a **local** level should be possible in the operational phase in the medium-to long-term.

Otter and Water Vole

Construction Phase Impacts

9.232 Otter and water vole may be impacted through accidental direct harm (to animals or their burrows) or disturbance during any construction activity affecting boundary habitats (ditches, watercourses and associated adjacent scrub, hedgerows or woodland). However, deliveries to and traffic associated with the Development are not anticipated during the time of day that otters would be expected to be active, nor are they likely to shelter during the day within habitats to be cleared or within at least 30m of the development footprint. Furthermore, the design of the Development is such that buffer zones will be installed prior to the onset of the construction phase, prohibiting movements of construction vehicles,

plant, personnel and material within at least 10m of every watercourse within the Site. As such, risks to these species are expected to be inherently minimal.

9.233 Riparian habitat quality (particularly rivers, streams and larger ditches) is at risk of degradation through pollution resulting from run-off, sediment/dust deposition and contamination are possible during the construction phase.

9.234 No severed or blocked/culverted watercourses will result from the Development, however, a single bridge will be subject to reinforcement works to facilitate construction access and maintenance. It is assumed that no invasive works to the bank beyond the existing footprint of the bridge will take place and, therefore no potential impacts other than temporary, minor disturbance of otter and water vole foraging/commuting habitat might occur which stands to be **significant at a Site level**.

Construction Phase Additional Mitigation Measures and Residual Effects

9.235 Additional precautionary working methods detailed in and secured by the CEMP will ensure reinstatement of all habitat disturbed and impacted during reinforcement of the construction access. ECoW monitoring of these works will also be specified so that no direct impacts to otter or water vole occur, for example where burrows are present. Consequently, this mitigation will ensure that residual effects on otter and water vole during construction will be **reduced to neutral levels.**

Operational Phase Impacts

9.236 Operational impacts are expected to be minimal, as vehicle movements will be infrequent and limited, likely to be no greater than those currently experienced at the Site through the normal operation of the farm and livery yard. There will also be no need to enter watercourse corridors in relation to the Development operation save for periodic ditch maintenance akin to that carried out under normal agricultural circumstances. These actions will follow ecologically sensitive methods and be detailed within the LEMP.

9.237 Due to the absence of any incursion into buffer zones, or physical alteration to watercourses, save for typical and planned habitat maintenance operations covered by the LEMP, no **adverse residual effects** on otters or water voles is anticipated.

Ecological Enhancement

9.238 The favourable management of the buffer zones for the duration of the Development will ensure that the habitat quality of the watercourses will be maintained and potentially enhanced in the medium- to long-term. Furthermore, due to the cessation of intensive arable practices within the majority of the Site, which result in the run-off of agricultural inputs, in combination with the favourable management of wider buffer zones, a **positive** effect **significant** at a **Local** level should be possible in the operational phase in the medium- to long-term.

Other Mammals

9.239 Hedgehog and Polecat may potentially occur within the site, likely in low densities given the suboptimal habitat suitability of habitat available to them (predominantly the hedgerows and narrow field margins).

Construction Phase Impacts

9.240 Impacts upon these species may arise from direct harm and mortality through clearance of habitat associated with creation of access gaps to facilitate construction at or close to field boundaries. This may give rise to an **adverse impact significant at a Site level.**

9.241 Habitat degradation through pollution events may also occur, and disturbance during the construction period may also cause some temporary displacement of these species. However, buffer zones around every field boundary habitat free of development will ensure the retention and enhancement of principal habitats used by these species for the life of the Development and, together with pollution prevention measures within the CEMP, minimise the likelihood degradation impacts will occur.

9.242 Construction Phase Additional Mitigation Measures and Residual Effects

9.243 As an additional mitigation measure to reduce risks associated with direct harm during site clearance, precautionary methods of working during any necessary clearance of boundary habitats is detailed within the CEMP. This includes sensitive seasonal timing of works, the presence of an ECoW and phased habitat removal. It is therefore assessed that additional mitigation measures during the construction phase, should reduce residual effects upon Hedgehog and Polecat to **neutral** levels.

Operational Phase Impacts

9.244 Operational impacts are expected to be minimal, as vehicle movements will be infrequent and limited, with no need to enter hedgerows or field margins in relation to the Development operation save for typical ecological habitat maintenance, the detail of which will be contained within the LEMP and cover sensitive timing and working methods. This will significantly limit the risk of disturbance or direct harm.

9.245 Due to the absence of any incursion into buffer zones, save for typical and planned habitat maintenance operations, no **adverse residual effects** on hedgehog and polecat are anticipated.

Ecological Enhancement

9.246 Proposed landscaping includes a significant area of tussocky grassland habitat creation and management within buffer zones and other marginal locations. Furthermore, significant lengths of new hedgerow and tree planting is proposed. Buffer zones will be wider than existing uncultivated field margins throughout the Development. These measures will increase the abundance of field margin habitat of suitability to these species. Connectivity and dispersal corridors for these species would likely increase, along with a reduction in disturbance and degradation from farming practices.

9.247 Assuming the full implementation of the proposed habitat creation and maintenance measures, particularly the cessation of agricultural activities and enlargement of field margins into grassy buffer zones, **a positive** residual effect**, significant at the Site** level is likely to occur during the operational phase.

Non-IEFs; Badgers

Construction Phase Impacts

9.248 Perimeter fencing is not considered to be a barrier to badger movement given their propensity for digging (the fencing will not be buried).

9.249 Badger gates are not considered necessary within security or protective fencing as there is no evidence of their usage from information gathered from extensive monitoring of active solar sites. Badgers are known to preferentially dig under fencing or move through gaps in the fencing material as opposed to actively seek features such as gates. Natural undulations in the ground should be used to ensure sufficient space beneath fencing to facilitate badger access is available. Where no such undulations occur it is considered most effective to raise the height of fencing panels to leave a narrow gap (no greater than 100mm) which badgers (among other animals) will exploit to gain access.

9.250 Permanent or temporary exclusion of the known badger setts is not anticipated to be required due to the implementation of the proposed buffer zones around them.

9.251 During construction works, if deep trenches are left open overnight or high voltage machinery is present, there may be potential for incidental injury or mortality to badgers exploring the Site during the night. Measures will be taken to reduce the probability of incidental mortality of badgers, especially in situations where open excavations are made and in respect of site speed limits. This also includes attendance of an EcoW during any habitat removal for temporary or permanent construction/ maintenance accesses in order for any previously undetected or recently-dug setts to be searched for and either avoided (through realignment of working area) or mitigated for through recourse to licensed sett closure. ECoW attendance during habitat clearance, pre-construction inspections for badger setts and the construction protocols to follow surrounding excavations are covered within the OCEMP.

9.252 Badgers may be adversely impacted by the Development through loss of habitat in which to build setts, accidental direct harm during construction, disturbance by vehicles and personnel or the compaction of soil around setts. However, 10m, 20m and 30m development free buffer zones around all known setts according to their status have been designed into the Development, together with the network of development-free buffer zones at field boundaries. As written into the OCEMP, all contractors will be informed about the presence of setts via a toolbox talk delivered by an ecologist prior to construction. No machinery will be driven within buffers or materials stored in them. With the implementation of the buffer zones and delivery of the CEMP as embedded mitigation, direct harm and habitat fragmentation effects on badgers can be expected to be **neutral** during the construction phase.

Operational Phase Impacts

9.253 Badgers are likely to benefit from improved abundance of favoured food items within the grassland under the arrays as permanent pasture grassland has been shown to contain a greater abundance of earthworms and soil invertebrates than arable soils.

9.254 Further benefits include reduced disturbance or habitat degradation due to cessation of agricultural activities and increased sheltering and dispersal habitat cover due to new hedgerow, tree, scrub and grassland habitat creation.

9.255 With the buffer zones in place, badgers are not considered likely to be affected by ongoing operational maintenance. Routine maintenance will also not typically be conducted during the hours of darkness.

Operational Phase Additional Mitigation Measures and Residual Effects

9.256 Considering the improvements to badger foraging habitat and creation of new hedgerows and tree planting into the landscape, a **positive residual effect** on badgers during operation of the scheme which would be **significant at Site level** is likely.

Non-IEFs; Widespread Reptiles and Amphibians

Construction Phase Impacts

9.257 The Development is almost entirely sited on land of low habitat quality for reptiles and amphibians, with suitable habitat being restricted to the narrow uncultivated field margins and hedgerows.

9.258 Impacts upon these species might comprise direct harm, habitat degradation and habitat loss during clearance of hedgerows or other field boundary habitats required for permanent/temporary construction and maintenance access. However, the Development will be offset from the single pond present within Alleston Wood (Pond 1) by no less than 30m, and generous ecological buffer zones measuring wider than existing field margins will mean that these impacts will largely be avoided. Where limited numbers (two new gaps and eight widened gaps) of breaches for Site access are required, some minor habitat loss can be expected, although the distances involved (2-6m) are not considered to be a significant barrier to dispersal, therefore impacts on connectivity are considered to be temporary and short-term.

9.259 A precautionary method of working, to be secured via the CEMP, will be followed during works affecting areas of potential reptile and amphibian habitat at field boundaries, for example where hedgerow gaps for access are required. These will include staged habitat clearance and sympathetic seasonal timings, along with the presence of an Ecological Clerk of Works to remove individual animals to suitable retained habitat where necessary. It is therefore considered that the above embedded mitigation measures mean that **significant effects on reptiles and amphibians during construction are avoided** and no additional mitigation measures are required.

Operational Phase Impacts

9.260 Impacts on reptiles and amphibians during the operation of the Development are likely to be minimal, considering the adoption of ecological buffer zones and the restriction of development and vehicle movement to outside of these, save for habitat management operations.

9.261 Habitat management operations will be timed appropriately to minimise mortality risk and detailed in the LEMP, along with the creation of SuDS features, which will be managed to maximise their benefit for biodiversity through plug planting and through the encouragement of tussocky grassland and scattered scrub.

Operational Phase Additional Mitigation Measures and Residual Effects

9.262 It is considered reasonably likely that habitat creation and maintenance measures, in conjunction with the favourable management of considerably larger buffer zones than current field margins, would result in a **positive** effect for reptiles and amphibians, **significant** at least at **Site** level.

Ecological Enhancement

9.263 Specific habitat features, such as log pile hibernacula or grass piles, will be incorporated into the LEMP, as well as habitat management prescriptions to be of value to reptiles and amphibians along with other wildlife. These habitats will notably include tussocky grassland margins adjacent to the streams. Through the addition of these features, it is considered that a **positive** effect on reptiles and amphibians **significant at Local level** is possible in the medium term.

Non-IEFs; Invasive Non-native Species

Construction Phase Impacts

9.264 Although no Schedule 9 species have been observed within the development footprint to date, invasive non-native species may be caused to spread through works associated with the stream and crossing thereof, or during any necessary works to clear habitats, as these species are most likely to occur at field boundaries and in habitats associated with watercourses.

9.265 The known stand of Japanese knotweed will be sufficiently distant from the construction area (>40m at nearest point to new access track), that it is highly unlikely to be caused to spread by construction activities.

9.266 Precautionary measures secured through the CEMP will be taken to avoid the accidental spread of these species. This includes a briefing for all construction staff on the issue to ensure vigilance for these species, as well as inspections of proposed working locations at watercourses and ditches, such as new and reinforced accesses at field boundaries, by an ecologist prior to commencement. Consequently, it is considered that impacts during construction concerning the spread of non native species will be adequately **avoided during construction** and no additional mitigation measures are considered necessary.

Operational Phase Impacts

9.267 Landscaping proposals for the Development will comprise new, native planting using species of local provenance, where appropriate, which will be detailed within the LEMP to be secured by planning condition. Considering the imposition of buffer zones and the limited current extent of Japanese knotweed located outside of the development footprint, the potential for significant impacts concerning non-native species during operation is low, but accidental spread of such species during ongoing habitat maintenance operations would present the risk of an **adverse impact significant at Local level.**

Operational Phase Additional Mitigation Measures and Residual Effects

9.268 It is considered that the continued specific monitoring for invasive non-native plant species during habitat management activities, together with a timetable of periodic monitoring of retained and created habitats by an ecologist, as secured by the LEMP, will enable the early recording and eradication of any non-native species and so reduce potential residual effects on this issue to **neutral** levels.

Cumulative Effects

9.269 Any potential for cumulative effects arising from the combined impacts of similar or large-scale development in proximity to the Development with those given above, are discussed here. Where no

cumulative impact pathway is deemed to exist between any of the IEFs and the three schemes as a whole, that IEF will not be discussed.

9.270 As outlined in Chapter 2 of the ES, developments the Applicant is aware of at this stage, which will form part of the assessment, are:

- ***Golden Hill Solar*** *– Operational since 2015, 6.25MW capacity and occupying an area of approximately 11.5ha. 1.6km north of the Site.*
- ***West Farm Solar, Cosheston*** *– Operational since 2023, 9MW capacity and occupying an area of approximately 11.3ha. 3.5km north of the Site*

9.271 These schemes are similar to the Development, albeit on a smaller scale, in that they both revolve around the development of agricultural fields to solar arrays. The submitted landscape plans for both schemes retain, protect and enhance boundary habitats in accordance with recommendations laid out within planning documents. These specified the following:

- ***Golden Hill Solar*** *– protection and retention of trees / hedgerows; a 20m buffer around ponds and a 15m buffer around the woodland*[xi]
- ***West Farm Solar*** *- all mature trees, are protected in accordance with British Standard 5837:2012, through the establishment of appropriate root protection zones. In addition, is recommend that an appropriate buffer, of 5m, is provided around retained hedgerows*[xii]*.*

Designated Sites

Construction Phase

9.272 Many of the designated sites at risk of impacts from the Development were located to the south of the Site and are therefore substantially more distant from the other two solar sites. This increased distance, as well as the embedded mitigation already designed into the Development, **no cumulative construction phase impacts are considered likely** to occur with these sites.

9.273 No watercourses were identified as associated with the two solar sites, making the likelihood of the discharge of significant pollutants and sediments into watercourses very low. Therefore, in the light of the embedded mitigation within the proposed Development, **no cumulative impacts** on designated sites to the north of the Development, which were at risk of negative effects due to the hydrological link, are anticipated.

9.274 All neutral residual construction phase effects identified within the assessment of effects are likely to remain as such even when the potential for cumulative impacts is factored in. The only designated sites which are considered at risk of cumulative effects are those in proximity to the part of the Cable Route Corridor within the Shared Cable Corridor, as discussed below.

Operational Phase

9.275 Ongoing operational maintenance at all three sites is anticipated to be contained to within the fenced areas away from buffered watercourses and peripheral habitats and consist of occasional movements of a small number of road vehicles. Therefore, considering the lack of operational phase residual effects on designated sites identified for the Development, together with the limited risk for any impact pathways to occur between the developments in question and designated sites, **no operational phase cumulative effects** from the three proposals taken together are considered likely to arise.

Habitats

Construction Phase

9.276 The nature of solar developments is to occupy field centres, and the pervasive land use in this area is arable farming / grazing pasture. Habitat losses at all three sites have been limited to the clearance of a

small proportion of hedgerow for construction and maintenance access, as well as the loss of some agricultural grasslands to be replaced by a greater diversity of low-input grassland. Despite this commonality between the three schemes, the quantum of hedgerow loss and the replacement of existing grassland with grassland of a higher ecological importance means that **adverse cumulative impacts are highly unlikely**, with the potential for **cumulative beneficial effects** in terms of the proliferation of low-input grasslands at the **Local level**.

Operational Phase

9.277 Considering the lack of operational phase residual effects on habitats identified for the Development, **no cumulative effects** from the three proposals taken together are considered likely to arise during the operational phase.

Badger

Construction Phase

9.278 Given the lack of significant residual effects likely to arise from the Development, together with the small scale of the other two schemes and anticipated standard buffering of any known badger setts, it is **unlikely that cumulative effects will occur** on badgers during construction activities.

Operational Phase

9.279 All schemes are likely to result in the creation of substantial areas of habitat suitable for badgers in terms of foraging or sett creation. Consequently, the already Site-level residual beneficial effect from the Development has the potential to be superseded by a **Local level beneficial cumulative effect** on badgers as a result of the schemes.

Bats

Construction Phase

9.280 All three schemes have sought to secure the retention of the vast majority of the most valuable habitat for bats, namely the hedgerows, ditches and watercourses, field margins and woodland. The loss of a small degree of hedgerow habitat among all three sites in order to facilitate construction and maintenance access is expected, however it will be of such a small proportion, and create gaps of such a small size, that residual effects on bats on all schemes would be unlikely, especially considering the prevalence of hedgerow planting for ecological enhancement and landscape/visual impact mitigation. In addition, disturbance from construction lighting is not anticipated since solar far construction rarely requires such lighting, often being restricted to occasional use during the winter months when bats can be expected to be in hibernation. Consequently, **adverse cumulative effects during construction are considered unlikely**.

Operational Phase

9.281 Each scheme can be anticipated to result in the reversion of agricultural grasses or arable land to a greater diversity of low-input grassland types, as well as substantial planting of hedgerows. The proposed Development will also result in substantial woodland and orchard planting. This habitat creation is typically set out within a LEMP and secured by a planning condition for enactment throughout the life of the schemes.

9.282 Furthermore, lighting is not anticipated to be required in the operation of the schemes other than for limited occasions at site cabins and transformers when maintenance staff are in attendance during the evenings or in the winter months.

9.283 The buffer zone habitat creation and enhancement, and grassland seeding across both sites will result in **a cumulative beneficial effect** for foraging, dispersing and roosting bats significant at a **Local level** is potentially possible, the extent of which will vary depending on what the proposed management of land beneath panels transpires to be, as well as the decision-making surrounding monitoring.

Breeding Birds

Construction Phase

9.284 Given the lack of significant residual effects likely to arise from the proposed Development, together with the small scale of the other two schemes, it is **unlikely that cumulative effects will occur** through direct harm or displacement of breeding territories.

Operational Phase

9.285 Ground nesting birds such as skylark and meadow pipit are at risk of displacement by solar farm proposals. However, a relatively small number (4 and 3, respectively) of territories (and, consequently, a minor impact) were recorded at the Site, therefore it is probable that even fewer, if any, such territories would be present at these far smaller operational sites. For example, territory sizes for skylark within winter cereal crop are, on average, 2.5ha in size. Further to this, ecology documents submitted for both Golden Hill and West Farm developments highlighted a lack of suitability for ground-nesting birds and surveys for these species were not carried out as a result. Consequently, it is highly **unlikely that significant cumulative effects** might occur as a result of the Development in the light of the above schemes.

Overwintering Birds

Construction Phase

9.286 Given the lack of significant residual effects likely to arise from the proposed Development, together with the small scale of the other two schemes, it is **unlikely that cumulative effects will occur** through the disturbance of wintering birds during construction activities.

Operational Phase

9.287 A small number of snipe are anticipated to be displaced from foraging within the grassland at the proposed Development during operation. However, considering the far smaller scale of the other two sites and therefore the reduced quantum of habitat suitable for snipe capable of being impacted, it is considered **unlikely that a cumulative effect would occur** on this or other wintering bird species.

Otter and Water Vole

Construction Phase

9.288 The Development and the two identified solar schemes are unlinked, hydrologically, given that both sites lie to the north of Pembroke and the associated watercourses. In addition, two A-roads run between the Development and the Sites. Significant barriers to water vole and otter dispersal are therefore present, limiting the potential for impact pathways between the proposed Development and the other sites. Furthermore, all three schemes are likely to take reasonable steps to retain and protect their ditch and watercourse networks through habitat buffering and the siting of infrastructure within field centres. Consequently, it is **highly unlikely that any adverse cumulative effects will arise** as a result of the construction of the schemes.

Operational Phase

9.289 As effects from the Development are neutral, and ongoing maintenance and operation will likely involve occasional movements by a small number of road vehicles, potential impacts from any of the schemes on otters or water voles are unlikely. Therefore it is considered that **cumulative effects during the operation of these schemes on otter and water vole are unlikely**.

Reptiles and Amphibians

Construction Phase

9.290 Considering the restriction of habitat for these species within the proposed Development to undevelopable land or land not included within the development footprint, it is likely that the same approach will be taken at the other two sites. Consequently, it is highly likely that habitat for these species is limited and will not be directly impacted to any significant extent across all schemes. Therefore, **no cumulative effects** on these species during construction are anticipated.

Operational Phase

9.291 Given the moderate positive effects of the Development predicted on these species, and the likelihood that hedgerow habitats will have been preserved within the other two projects, no negative cumulative impacts are anticipated. Depending on the habitat creation and management provisions committed to by the other schemes, a potential **beneficial cumulative effect at up to a Local level** may occur for these species in the long term, through the proliferation and enhancement of their habitat.

Hedgehog and Polecat

Construction Phase

9.292 Considering the location of the array structures on the sites and the Development within cultivated and pasture field centres, as opposed to field boundaries (which are the typical habitats for these species), the risk of direct harm or habitat loss for these species is already low. The small amount of hedgerow habitat which will likely be lost to all schemes may cause direct harm, but standard risk avoidance measures likely undertaken as part of the completed schemes, and as detailed within the submitted OCEMP for the Development, would enable this to proceed lawfully. Due to the size of the other two sites, the quantum of habitat loss is also likely to be very low. Consequently, it is considered that **no construction phase cumulative effects** on these species are likely to occur.

Operational Phase

9.293 Given the lack of significant residual effects likely to arise from the operation of the Development, together with the small scale of the other two schemes, it is **unlikely that cumulative effects will occur** on hedgehog and polecat during the operation of the schemes.

Decommissioning

9.294 As set out in Chapter 3 of the ES, following the operational period of 40 years, the Development will be decommissioned, and the Site may be returned to its current agricultural use. All solar array infrastructure including modules, mounting structures, cabling, inverters and transformers would be removed and recycled or disposed of in accordance with good practice available at the time. Additional measures for the decommissioning phase have been recommended and detailed within Chapter 5 and outlined within the submitted oDEMP (Appendix 5.2).

Decommissioning effects

9.295 The assessment of decommissioning effects takes into account the measures set out in the oDEMP, which accompanies this ES. Activities relating to the removal of modules, mounting structures, cabling, inverters and transformers would be expected to have similar (or no worse) direct effects as those described in the construction phase impacts for each receptor. Comparable levels of disturbance from movement of vehicles and personnel would be expected.

9.296 Considering the anticipated 40-year lifespan of the Development, the accurate prediction of decommissioning effects is challenging and can only be informed by the legal, policy and conservation constraints and priorities present at the time of application. However, the following impacts can be reasonably anticipated:

i. Habitat loss and habitat change; it is assumed that the fields will be able to be returned to agricultural use upon decommissioning, therefore this habitat change will need to be considered, including impacts on any newly created habitats. This is discussed further in paragraph 9.281 below.

ii. Killing and injury; as per the construction phase, risks of direct harm to species should be considered.

iii. Habitat fragmentation; while the removal of development infrastructure as a reversal of the construction phase is unlikely to result in habitat fragmentation, the reversion to agriculture may impact connectivity between habitats networks and species populations, which have arisen as a result of the Development.

iv. Disturbance; disturbance impacts are likely to be the same as those described within the construction phase.

v. Pollution and habitat degradation; this risks of these impacts occurring are likely to be the same as the construction phase.

9.297 The restoration of the land to open arable farmland would likely be beneficial for some species of farmland bird, which require open sightlines, as well as for plant species associated with arable margins. However, much of the biodiversity value that it is anticipated to develop in the preceding (approximately) forty years would be lost along with habitat for a variety of other species. In order to revert back to arable food production, it may be necessary to enhance the nutrient content of the soil if it has been depleted, which would likely be achieved through treatment with fertilisers. An increase in the use of pesticides and herbicides would also be expected. The decision on the farming type to be used will be made by the landowner prior to decommissioning.

9.298 Depending on the ecological value of the habitats that develop over the lifespan of the Development, it is realistic that certain areas of the Site may be retained due to their value for wildlife at the point of decommissioning. Additionally, application of the ecological mitigation hierarchy principles may be necessary.

9.299 No more than 1-2 years prior to decommissioning commencing, the Site will be visited by an appropriately qualified ecologist to identify any ecological constraints arising from decommissioning activities. Further surveys, mitigation and/or compensatory measures may then be required in line with prevailing guidance. As a minimum, an extended Phase 1 Habitat survey (or equivalent) is considered likely to be required to identify the potential presence of protected species and important habitats.

9.300 Based on current (2024) legislative protection, protected species (or species of conservation concern) that could be directly impacted by decommissioning activities include badger, bats, breeding birds, dormouse, otter, water vole, widespread reptile and amphibian species, and invasive species. Further survey(s) to identify the use of the Site by these receptors may therefore also be expected as a minimum.

9.301 Any mitigation measures undertaken at the point of decommissioning aimed at maintaining ecological value of the site should take account of changes in ecological objectives that have occurred over the lifespan of the array. In particular, changes in ecological conditions both on the Site and on a national scale as a result of climate change may result in new ecological objectives that cannot at the current time be reasonably foreseen.

9.302 Generic mitigation measures for decommissioning will include the implementation of a sensitive lighting strategy, pollution prevention measures, dust management measures, noise mitigation measures, drainage strategy, waste management and appropriate storage of materials.

Summary

9.303 The impact assessment on biodiversity sets out the baseline conditions of the Site at the time of writing and considers the likely effects of the Development of the ecological features during its construction and operational phases.

9.304 A comprehensive suite of ecological surveys has been undertaken within the defined survey area. Specific surveys for priority habitats, bats, breeding and wintering birds, otter, water vole and badgers have been carried out. Habitats have been assessed for other notable species groups including reptiles and amphibians, invertebrates and other mammals. Furthermore, a desk study to examine the presence of third-party records or the presence of protected species and the whereabouts of local and statutory sites designated for nature conservation has been undertaken.

9.305 The Site occupies agricultural land, comprising arable and non-arable cropland and livery (i.e. horse-grazed pasture) on undulating ground characterised by large fields bound by a mature network of hedgerows and streams functioning as drainage features. Uncultivated field margins were generally very narrow, with the exception of a large, steep bank managed for silage in the south of the Site. A remnant ancient woodland parcel and large standing waterbody lay adjacent to the site boundary, between to the northern and southern parcels.

9.306 An OLEMP has been prepared for the Development which sets out all the habitat creation and management prescriptions to be adopted through the life of the operational Development. This focuses on the creation of new hedgerows, diverse grassland (e.g. pollinator-mix grassland, herb-rich flowering grassland and tussocky grassland), woodland habitat and orchard planting, as well as the favourable management of the grasslands under and surrounding the arrays so as to maximise their value to biodiversity. Retained hedgerows and watercourses will benefit from their sensitive management and the cessation of agricultural practices. In addition, all habitat creation and management prescriptions required in order to mitigate for potential negative effects of the Development will be set out in the OLEMP, and detailed further within the LEMP, to be secured by condition. Ecological enhancement measures will also be contained in the OLEMP, including new nesting and roosting habitat for birds and bats, and measures required to achieve a Net Benefit for Biodiversity.

9.307 Protected sites such as Sites of Special Scientific Interest that were noted within 5km of the Sites for their wetland habitats will be protected from potential pollution events or disturbance during construction.

9.308 Several badger setts have been recorded within the field boundaries, which will be protected through the adoption of a development free buffer zone of 30m in radius. Habitat connectivity for badgers will be maintained and foraging will be enhanced through reversion from arable to grassland. Perimeter fencing will remain permeable to the movement by badgers.

9.309 A diverse assemblage of bat species has been recorded using the Site, including rare species in the area, while mature trees located within the Site are assumed to have roost potential. The arable fields themselves are of low value to bats owing to the uniformity of habitat and low productivity for night flying invertebrate prey, although the grazing pasture may offer some suitability. All hedgerows and watercourses will be buffered from development by a minimum of 5m. Substantial planting of new trees and hedgerows will also be undertaken and new linear habitat linkages between isolated trees and nearby woodland will be created. No trees will be subject to development impacts. Habitats post-construction on Site are likely to be improved for bat foraging, roosting and dispersal overall.

9.310 The watercourses around the Site offered suitability for use by otter and water vole to varying degrees and otter were confirmed as present. These watercourses will be buffered by at least 10m from development. Impacts on otter and water vole are considered unlikely, with the potential for improvements post-construction.

9.311 Farmland birds such as Meadow Pipit and Skylark were recorded either foraging or nesting on Site with several other species of conservation concern associated predominantly with the field boundary habitats, such as Linnet. Ground nesting species which choose to nest within open arable fields stand to be displaced to a degree by the development. Mitigation of this impact through the favourable management of open nesting habitat away from the array installations will be provided on Site, which can be expected to reduce this impact to acceptable levels in most cases, and will be secured by the LEMP. Construction-phase impacts on birds during the nesting season will be avoided through a combination of habitat inspections by an Ecological Clerk of Works, sensitive timing of works and the imposition of exclusion buffers around known and potential nest sites.

9.312 Residual impacts will be reduced to non-significant levels through the implementation of appropriate mitigation. The Development will result in a Net Benefit for Biodiversity in the long term through the proposed landscaping and LEMP. A package of habitat and species-specific ecological enhancements

will also be carried out. The predominant habitat management to be carried out within the operational Development will be grassland cutting or conservation grazing, with an emphasis on the generation of a mosaic of grassland types being more diverse than the baseline habitat condition.

9.313 Table 9.4 contains a summary of the likely significant effects of the Development.

Table 9.3: Table of Significance – Biodiversity

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Construction Phase						
Pembrokeshire Marine SAC Milford Haven Waterway SSSI Pembroke Mill Ponds LNR and WTR	None	N/A	N/A	N/A	International	No Significant Effects
Bristol Channel Approaches SAC	None	N/A	N/A	N/A	International	No Significant Effects
Pembrokeshire Bat Sites and Bosherston Lake SAC	None	N/A	N/A	N/A	International	No Significant Effects
Castlemartin Coast SPA	None	N/A	N/A	N/A	International	No Significant Effects
Freshwater East Cliffs to Shrinkle Haven SSSI Stackpole Quay to Trewent Point SSSI Stackpole NNR Freshwater East LNR	None	N/A	N/A	N/A	International/ National/ Local	No Significant Effects
Woodland & Scrub	Minor loss of scrub	Adverse; duration of construction.	Site level	Implementation of 15m no-works buffer of Ancient woodland. Secured by CEMP. Enhancement planting of 1.77ha of new woodland and 0.08ha of orchard.	Local	Beneficial, significant at Local level.

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Hedgerows and Trees	40m hedgerow loss to facilitate construction and maintenance access.	Adverse, duration of development.	Site level	Planting of 1.44km of new hedgerow. Secured by LEMP.	Local	Beneficial, significant at Local level.
Watercourses & Ditches	None	N/A	N/A	N/A	Local	No Significant Effects
Bats	Removal of 40m hedgerow – habitat loss/fragmentation.	Adverse, duration of development.	Site level	Pollution prevention measures and implementation of development-free buffers. Secured by CEMP.	Site level	No Significant Effects
Breeding Birds	None	N/A	N/A	N/A	Local	No Significant Effects
Overwintering Birds	Disturbance of wintering birds during construction – direct harm.	Adverse, duration of construction during winter months.	Site level	Ecological Clerk of Works provision during winter months. Secured by CEMP.	Local	No Significant Effects
Dormouse	Removal of 40m hedgerow – direct harm and/or disturbance, and habitat fragmentation.	Adverse, duration of construction.	Site level	Ecological Clerk of Works provision. Secured by CEMP.	Local	No Significant Effects
Otter and Water Vole	Reinforcement of bridge – disturbance or direct harm.	Adverse, duration of construction	Site level	Ecological Clerk of Works provision. Secured by CEMP.	Local	No Significant Effects
Hedgehog & Polecat	Removal of 40m hedgerow – direct harm and/or disturbance, and habitat fragmentation.	Adverse, duration of construction.	Site level	Ecological Clerk of Works provision. Secured by CEMP.	Local	No Significant Effects
Badger	None	N/A	N/A	N/A	Site	No Significant Effects
Widespread Reptiles & Amphibians	None	N/A	N/A	N/A	Site	No Significant Effects

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Invasive Non-native Species	None	N/A	N/A	N/A	Site	No Significant Effects
Operational Phase						
Pembrokeshire Marine SAC Milford Haven Waterway SSSI Pembroke Mill Ponds LNR and WTR	None	N/A	N/A	N/A	International	No Significant Effects
Bristol Channel Approaches SAC	None	N/A	N/A	N/A	International	No Significant Effects
Pembrokeshire Bat Sites and Bosherston Lake SAC	None	N/A	N/A	N/A	International	No Significant Effects
Castlemartin Coast SPA	None	N/A	N/A	N/A	International	No Significant Effects
Freshwater East Cliffs to Shrinkle Haven SSSI Stackpole Quay to Trewent Point SSSI Stackpole NNR Freshwater East LNR	None	N/A	N/A	N/A	International/ National/ Local	No Significant Effects
Woodland & Scrub	Cessation of agricultural practices and spray drift	Beneficial, duration of development	Site level	Implementation of LEMP – habitat creation and management.	Local	Beneficial, significant at Site level
Hedgerows and Trees	Ecologically-led management of new and retained habitat.	Beneficial, duration of development	Site level	Implementation of LEMP – habitat creation and management.	Local	Beneficial, significant at Site level

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Watercourses & Ditches	Ecologically-led management of field margins and cessation of agricultural practices.	Beneficial, duration of development	Local level	Implementation of LEMP – habitat management.	Local	Beneficial, significant at Local level.
Bats	Grassland, woodland and hedgerows creation and diversification.	Beneficial, duration of development	Site level	Implementation of LEMP – habitat creation.	District	Beneficial, significant at Site level.
Breeding Birds	Displacement of up to 4 skylark and up to 3 meadow pipit territories.	Adverse, duration of development	Site level	Implementation of LEMP to provide optimal grassland foraging habitat for ground nesting birds.	Local	No significant effects.
Overwintering Birds	Inaccessibility of site post-construction to foraging snipe.	Adverse, duration of development	Site level	None	Local	Adverse, significant at Site level.
Dormouse	None	N/A	N/A	N/A	Local	No significant effects.
Otter and Water Vole	None	N/A	N/A	N/A	Local	No significant effects.
Hedgehog & Polecat	None	N/A	N/A	N/A	Local	No significant effects.
Badger	Creation of diverse grassland, orchard and woodland.	Beneficial, duration of development	Site level	Implementation of LEMP – habitat creation.	Site	Beneficial, significant at Site level.
Widespread Reptiles & Amphibians	Creation of diverse grassland, orchard and woodland. Creation of log pile hibernacula and other shelter.	Beneficial, duration of development	Local level	Implementation of LEMP -habitat creation and species enhancements.	Site	Beneficial, significant at Local level.
Invasive Non-native Species	Accidental spread of any colonising INNS during maintenance works.	Adverse, duration of development	Local level	Implementation of LEMP – monitoring programme.	Local	No significant effects.

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Cumulative Effects						
Construction						
Designated Sites	None	N/A	N/A	N/A	International/ National/ Local	No cumulative effects.
Habitats	Extensive hedgerow planting at all three sites.	Beneficial, permanent.	Local level	Implementation of LEMPs – habitat creation.	Local	Beneficial, significant at Local level.
Badger	None	N/A	N/A	N/A	Site	No cumulative effects.
Bats	None	N/A	N/A	N/A	District	No cumulative effects.
Breeding Birds	None	N/A	N/A	N/A	Local/ Site	No cumulative effects.
Overwintering Birds	None	N/A	N/A	N/A	Local	No cumulative effects.
Otter and Water Vole	None	N/A	N/A	N/A	Local	No cumulative effects.
Reptiles and Amphibians	None	N/A	N/A	N/A	Site	No cumulative effects.
Hedgehog and Polecat	None	N/A	N/A	N/A	Site	No cumulative effects.
Operation						
Designated Sites	None	N/A	N/A	N/A	International/ National/ Local	No cumulative effects.
Habitats	None	N/A	N/A	N/A	Local	No cumulative effects.
Badger	Planting of woodland, grassland and hedgerows at all three sites.	Beneficial, permanent.	Local level	Implementation of LEMPs – habitat creation.	Site	Beneficial, significant at Local level.

IEF	Potential Impact	Nature of Impact	Significance	Mitigation / Enhancement Measures	Ecological Importance	Significance of Residual Effects (Beneficial/ Adverse/ No Significant Effects)
Bats	Planting of woodland, grassland and hedgerows at all three sites.	Beneficial, permanent.	Local level	Implementation of LEMPs – habitat creation.	District	Beneficial, significant at Local level.
Breeding Birds	None	N/A	N/A	N/A	Local/ Site	No cumulative effects.
Overwintering Birds	None	N/A	N/A	N/A	Local	No cumulative effects.
Otter and Water Vole	None	N/A	N/A	N/A	Local	No cumulative effects.
Reptiles and Amphibians	Tussocky grassland creation and hedgerow planting.	Beneficial, permanent.	Local level	Implementation of LEMPs – habitat creation.	Site	Beneficial, significant at Local level.
Hedgehog and Polecat	None	N/A	N/A	N/A	Site	No cumulative effects.

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