9 ECOLOGY

9.1 Introduction

9.1.1 This Environmental Statement (ES) chapter presents the assessment of potential impacts and effects on ecological receptors as a result of the Proposed Development and has been based on the design described in Chapter 2: Site Description.

9.1.2 This chapter is submitted in respect of appeal reference CAS-02641-G8G7M5 in September 2024. It addresses the comments made by PEDW in its ES Completeness Report issued in June 2023. It is based upon ecological survey and assessment work that has been obtained to date to provide an accurate representation of all ecological features likely to be present on Site.

9.1.3 This chapter provides the following:

- Relevant legislation, policy and guidance;
- The assessment methodology;
- Baseline conditions within the Site and Study Areas;
- Embedded and tertiary mitigation adopted as part of the Proposed Development;
- A summary of the likely significant effects;
- Mitigation measures required to ensure compliance with biodiversity legislation and to address any potentially significant ecological effects, including enhancement measures;
- The significance of residual effects; and
- A summary of cumulative effects with other development proposals.

9.1.4 This chapter is intended to be read in conjunction with Chapter 6: Landscape and Visual, particularly in relation to green infrastructure. Where information has been obtained from supporting documents submitted as part of the planning application this has been stated. New assessment information relating to ecological surveys are documented in reports and included in Appendix 9.1. Documents that were submitted as part of the planning application prior to the appeal stage are not included within an appendix to this ES chapter. Information relating to the outline development proposals at the Model Farm site is within Chapter 2: Site and Project Description.

9.1.5 The application boundary as illustrated on Figure 2 of this ES (drawing JCD0064-001-D-210331) Site Boundary Plan is hereafter referred to as the 'Site' and comprises the proposed infrastructure development and associated green infrastructure (Area A) and adjoining land to the south proposed as an extension to Porthkerry Country Park (Area B).

9.1.6 The information presented in this document is based upon ecological surveys and assessments of the Site between 2018 and 2024. It has been prepared as per Chartered Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (CIEEM, 2018).

9.2 Legislation, Policy and Guidance

Legislation

9.2.1 The following legislation and guidance relate specifically to ecology and have been considered where relevant:

- Environment (Wales) Act 2016;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended);

- The Countryside and Rights of Way (CRoW) Act 2000;
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;
- The Well-being of Future Generations Act (Wales) 2015.

9.2.2 The Environment (Wales) Act 2016 includes measures to provide an integrated natural resource management process to deliver the sustainable management of natural resources. That means the collective actions (including non-action) required for managing the maintenance, enhancement and use of natural resources in a way, or at a rate, which enables people and communities to provide for their social, economic and environmental well-being in Wales.

9.2.3 Section 6 of the Act sets out a biodiversity and resilience of ecosystems duty. This applies to a range of public authorities such as the Welsh Ministers, local planning authorities and public bodies. This ensures that biodiversity is an integral part of the decisions that public authorities take in Wales. It also links biodiversity with the long-term health of ecosystems and aligns to the framework for sustainable natural resource management in the Act. The Act requires all public authorities in Wales to report on the actions they are taking to improve biodiversity and promote ecosystem resilience.

9.2.4 Section 7 of the Act requires the Welsh Government to prepare and publish a list of the living organisms and types of habitat which in their opinion are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales, and to take measures to maintain and enhance these species and habitats. Hereafter these are referred to as' 'Priority Species' or 'Priority Habitats'.

9.2.5 The Well-being of Future Generations (Wales) Act 2015 includes a number of well-being goals (Part 2 Section 4), the second of which is 'A resilient Wales' described as: '*A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change)*.'

National Planning Policy and Guidance

9.2.6 The following national and local planning policy documents and guidance are relevant to the Proposed Development:

- Planning Policy Wales 12.
- Technical Advice 5: Nature Conservation and Planning.
- The Nature Recovery Plan for Wales 2020.
- Biodiversity Duty Plan 2017.
- Future Wales – The National Plan 2040.
- Action Plan for Pollinators in Wales.
- The UK Biodiversity Framework 2024.

9.2.7 Planning Policy Wales 12, Section 6, paragraph 6.2.11 states:

> *"The quality of the built environment should be enhanced by integrating green infrastructure into development through appropriate site selection and use of creative design. With careful planning and design, informed by an appropriate level of assessment, green infrastructure can embed the benefits of biodiversity and ecosystem services into new development and places, help to overcome the potential for conflicting objectives, and contribute to health and well-being outcomes."*

9.2.8 Paragraph 6.4.3 states:

"Development plan strategies, policies and 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 statutorily and non-statutorily 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 adverse 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."*

9.2.9 Under Planning Policy Wales 12, it is a recommendation of the Welsh Government for a Green Infrastructure (GI) statement to be prepared as part of a planning application submission. The GI Statement should appropriately demonstrate how a net benefit for biodiversity is to be delivered as part of development proposals. The development design process should follow the step-wise approach and should detail how avoidance, minimisation, mitigation and enhancement measures have been adopted, with reference to diversity, extent, condition, connectivity and adaptability (the DECCA Framework), ecological connectivity and strengthening the future resilience of ecosystems within and adjoining the site.

9.2.10 For tree loss the compensation planting ratio is set at 3 trees replaced for every 1 lost, with each planted tree to be at least equivalent in quality, environmental and ecological importance as the tree being lost. Replacement planting should be preferentially on-site or immediately adjacent to a site.

9.2.11 Future Wales, Policy 9 – Resilient Ecological Networks and Green Infrastructure states:

"…action towards securing the maintenance and enhancement of biodiversity (to provide a net benefit), the resilience of ecosystems and green infrastructure assets must be demonstrated as part of development proposals through innovative, nature-based approaches to site planning and the design of the built environment."

Local Planning Policy and Guidance

9.2.12 The relevant local plans, policies and guidance are:

- Vale of Glamorgan Local Development Plan (LDP) 2011-2016.
- Biodiversity and Development – Supplementary Planning Guidance (SPG).
- Trees, Woodland, Hedgerows and Development – SPG.

Vale of Glamorgan Local Development Plan 2011-2016

9.2.13 The policies within the Vale of Glamorgan Local Development plan which are relevant to this chapter are summarised below.

Policy SP10 - Built and Natural Environment

9.2.14 Amongst other measures unrelated to ecology, Policy SP10 requires that:

Development proposals must preserve and where appropriate enhance the rich and diverse built and natural environment and heritage of the Vale of Glamorgan including: Sites designated for their local, national and European nature conservation importance;

Policy MG18 - Green Wedges

9.2.15 Policy MG18 identifies several Green Wedges which aim to:

…prevent the coalescence of settlements and to retain the openness of land.

9.2.16 The proposed development site is located within one of the seven identified Green Wedges, namely: Green Wedge number 7: Between Rhoose and Aberthaw. The policy states that

Within these areas development which prejudices the open nature of the land will not be permitted.

9.2.17 The policy recognises that the areas defined as green wedges:

…are more vulnerable and susceptible to change and require additional protection. Therefore, within the areas defined by the green wedges there will be a presumption against inappropriate development which would contribute to urban coalescence, prejudice the open nature of the land, or have an adverse impact upon the setting of an urban area.

9.2.18 Details of each of the designations are contained within the Green Wedge Background Paper (2013).

Policy MG19 - Sites and Species of European Importance

9.2.19 Policy MG recognises the importance of sites and species of European Importance including Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar Sites and European Protected Species (EPS). The policy re-iterates the legal requirements of the protections under the Conservation of Species and Habitat Regulations (2017) as amended in stating the following in relation to European protected sites:

Development proposals likely to have a significant effect on a European site, when considered alone or in combination with other projects or plans will only be permitted where: 1. The proposal is directly connected with or necessary for the protection, enhancement and positive management of the site for conservation purpose; or 2. The proposal will not adversely affect the integrity of the site; 3. There is no alternative solution; 4. There are reasons of overriding public interest; and 5. Appropriate compensatory measures are secured.

9.2.20 The policy goes on to state:

Any development proposals that are likely to affect European designated sites or will be determined in accordance with national planning policy set out in Planning Policy Wales and Technical Advice Note 5: Nature Conservation and Planning (2009) and relevant case law.

9.2.21 In relation to the need for Habitat Regulations Assessment the policy assets that in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended):

any development proposals that has [sic] the potential for adverse impact on the integrity of a European site will be subject to a Habitats Regulations Assessment.

9.2.22 In relation to EPS, Policy MG19 states:

Development proposals likely to have an adverse effect on a European protected species will only be permitted where: 1. There are reasons of overriding public interest; 2. There is no satisfactory alternative; and 3. The action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

9.2.23 The policy also states:

Prior to implementing any consent that may be granted which may affect species of European importance, developers will need to secure a derogation from Natural Resources Wales under the Conservation of Habitats and Species Regulations 2017 (as amended), the 'Habitats Regulations.

Policy MG20 – Nationally Protected Sites and Species

9.2.24 Policy MG20 recognises the importance of nationally designated sites specifically, Sites of Special Scientific Interest (SSSI), and species protected under the Wildlife and Countryside Act 1981 (as amended) and species-specific legislation e.g. the Protection of Badgers Act 1992.

9.2.25 In relation to national designated sites the policy states:

Development likely to have an adverse effect either directly or indirectly on the conservation value of a site of special scientific interest will only be permitted where it is demonstrated that: 1. There is no suitable alternative to the proposed development; and 2. It can be demonstrated that the benefits from the development clearly outweigh the special interest of the site; and 3. Appropriate compensatory measures are secured; or 4. The proposal contributes to the protection, enhancement or positive management of the site.

9.2.26 In relation to protected species the policy states:

Development proposals likely to affect protected species will only be permitted where it is demonstrated that: 1. The population range and distribution of the species will not be adversely impacted; 2. There is no suitable alternative to the proposed development; 3. The benefits of the development clearly outweigh the adverse impacts on the protected species; and 4. Appropriate avoidance, mitigation and compensation measures are provided.

9.2.27 The policy also re-iterates the fact that the presence of a protected species is a material consideration in the determination of planning applications, and that the council will be guided by advice from Natural Resources Wales (NRW) in assessing any development proposal likely to result in harm to a protected species or its habitat.

9.2.28 The policy recognises that:

…there will always be a presumption against development which is likely to harm a protected site or species. However, there may also be instances when the importance of a development proposal will outweigh the conservation value, either temporarily or permanently to a SSSI / protected species and in such instances, the objective will always be to ensure that the nature conservation value of the site or protected species is preserved and where possible enhanced. Where development is permitted, appropriate conditions or agreed planning obligations will be used to secure adequate compensation or mitigation measures.

Policy MG21 – Sites of Importance for Nature Conservation, Regionally Important Geological and Geomorphological Sites and Priority Habitats and Species

9.2.29 In relation to ecology Policy MG21 recognises the importance of Sites of Importance for Nature Conservation (SINC), and Priority Habitats and Species (i.e. habitats and species listed as being of principal importance for conservation in Wales under Section 7 of the Environment (Wales) Act 2016. The policy states:

Development proposals likely to have an adverse impact on sites of importance for nature conservation or priority habitats and species will only be permitted where it can be demonstrated that: 1. The need for the development clearly outweighs the nature conservation value of the site; 2. Adverse impacts on nature conservation and geological features can be avoided; 3. Appropriate and proportionate mitigation and compensation measures can be provided; and 4. The development conserves and where possible enhances biodiversity interests.

9.2.30 The policy also states:

Development which is likely to have an adverse impact on SINCs, or Priority Habitats and Species will be required to demonstrate that every effort has been made to avoid and mitigate any adverse impacts and that the need for the development outweighs the nature conservation or geological value. Where on site mitigation is not possible or sufficient to prevent any adverse impact then off-site compensation will be required. Off-site compensation will be secured through planning conditions or Section 106 agreements as appropriate.

9.2.31 The policy refers to Supplementary Planning Guidance on 'Biodiversity and Development' to support these policies. The relevant elements of this guidance are described between Section 5 and 8 of the SPG.

Policy MD9 - Promoting Biodiversity

9.2.32 Policy MD9 emphasises the importance of biodiversity beyond that addressed under policy relating specific designations or legal protections. The policy states:

New development proposals will be required to conserve and where appropriate enhance biodiversity interests unless it can be demonstrated that: 1. The need for the development clearly outweighs the biodiversity value of the site; and 2. The impacts of the development can be satisfactorily mitigated and acceptably managed through appropriate future management regimes.

9.2.33 The policy goes on to state:

the biodiversity value of a proposed development site should be established at the earliest opportunity. Biodiversity value of sites should be assessed in national and local contexts. By virtue of their designation, internationally and nationally designated sites have the highest conservation value. Other sites such as SINCs or those sites that support a priority habitat or species should be assessed individually, but would likely be of lower conservation value.

9.2.34 The policy recognises that:

…the biodiversity value of local sites may be increased by having any of the following attributes below. • Diversity • Rarity • Naturalness • Size • Typicalness • Fragility • Irreplaceability …. where the site acts as a 'stepping stone', provides habitat connectivity or acts as a buffer zone to a designated site.

9.2.35 The policy recognises that where development is likely to have an adverse impact on a site with biodiversity value:

…the need for development must be weighed against the biodiversity value of the proposed development site.

9.2.36 Where a development will have an adverse impact on the biodiversity value of a site, the development must:

…demonstrate that the need for the development clearly outweighs the biodiversity value of the site.

9.2.37 The policy requires that developers:

demonstrate what measures have been taken to avoid an adverse impact on biodiversity and what mitigation measures will be undertaken to minimise the impact on biodiversity.

9.2.38 Where reasonable avoidance measures and mitigation are not sufficient in minimising an adverse impact, the policy requires that:

any residual impact should be addressed by appropriate and proportionate compensation measures. Compensation should ideally be located as close as possible to the original site and be on a like-for-like basis. Mitigation measures and compensation sites should be chosen so as to maintain biodiversity features or resources.

9.2.39 It is recognised that it is nearly always possible to provide biodiversity enhancement on development sites. Enhancement should be:

commensurate with the level of adverse impact and the scale of development.

9.2.40 The policy goes on to list possible enhancement measures, but more importantly recognises that enhancements can ensure:

> *…new developments…are "future-proof" allowing for* [species] *migration and colonisation in response to climate change.*

Biodiversity and Development – Supplementary Planning Guidance (Vale of Glamorgan, 2018)

9.2.41 The Biodiversity and Development SPG has been published by the Vale of Glamorgan top support the LDP delivery and can be a material consideration in the planning process. The SPG is intended to assist delivery of the following LDP policies: MG19, MG20, MG21 and MD9. In summarising the requirements of these policies, the SPG states:

> *…development must avoid any adverse impact on wildlife or biodiversity features on (or in close proximity to) a development site. When this is not possible, developers must be able to justify any adverse impacts and illustrate how the development has been designed to minimise the impact on biodiversity.*

9.2.42 The SPG provides guidance on the need for ecological surveys as appropriate, to be conducted by suitably qualified personnel and at an early stage, with reference to current best practice published by the CIEEM.

9.2.43 Although the SPG was published before the current iteration of PPW (12), the SPG highlights the importance of the mitigation hierarchy which is outlined more fully in the LDP and PPW. In accordance with the mitigation hierarchy, compensation will be seen as a last resort, with a requirement of a minimum ratio of like-for like compensation of 1:1.5 (50%)

9.2.44 The SPG also reiterates the duty to enhance biodiversity, re-iterating LDP Policy MD9 in the context of the requirements of The Environment (Wales) Act 2016.

9.2.45 The SPG also recognises the requirement for appropriate management to ensure long lasting benefits for biodiversity. The SPG states a minimum requirement for management plans to cover at least five years following completion of a development. Management is also to include monitoring which can trigger remedial actions.

9.2.46 The SPG reiterates the requirement for protected species licensing under the Conservation of Habitats and Species Regulations 2017 (as amended).

Trees, Woodland, Hedgerows and Development – SPG (Vale of Glamorgan, 2018)

9.2.47 The Trees, Woodland, Hedgerows and Development SPG provides, amongst other things, guidance on how trees woodland and hedgerows should be dealt with in development. The SPG requires that details of any trees to be affected by a development to be included in the planning application along with a tree survey, tree constraints plan and arboricultural impact assessment. The SPG reiterates the requirements of BS5837: 2012 'Trees in Relation to Design, Demolition and Construction – Recommendations' to which tree surveys should adhere.

9.2.48 The guidance emphasises the value of individual trees or groups of trees and the expectation for:

> *…the layout of new development to sensitively incorporate these features so that they provide additional visual amenity value to the development as well as opportunities for nature conservation. Additionally, where a neighbouring site contains existing natural features, the development should also consider how these can be linked to new "green features" in the proposed development.*

9.2.49 In relation to existing trees and hedgerows:

Sufficient space must therefore be provided for continued growth without necessitating an excessive level of maintenance. Therefore in the majority of cases, simply avoiding development within tree/hedge protection zones is unlikely to make adequate provision for their long-term retention. Instead developers should seek to utilise existing trees and hedgerows to compliment the final site design.

9.2.50 Where a tree subject to a Tree preservation Order (TPO) is to be removed a ratio replanting of 2:1 is normally required although the guidance recognises this may be more or less depending on individual circumstances.

9.2.51 For development close to existing woodland there should be:

a transitional area or 'ecotone' between new landscaping and the existing woodland should be provided to promote biodiversity and ensure ecosystem resilience.

9.3 Consultation

9.3.1 A head-line summary of consultation relevant to biodiversity is outlined in Table 9.1 below.

9.3.2 An EIA scoping exercise was originally undertaken in 2019 which scoped ecology out of the EIA and therefore, no specific EIA consultation has been undertaken.

9.3.3 In June 2023, Planning and Environment Decisions Wales (PEDW) issued an ES Completeness Report in respect of appeal reference CAS-02641-G8G7M5 which specified the requirements for updates to be made to the EIA. Whilst the Completeness Report does not request updates to the EIA in respect of ecology, the applicant has elected to undertake an EcIA.

9.3.4 All consultation relates to the outline planning application submission (2019/00871/OUT). Full consultation with the Vale of Glamorgan County Council can be viewed within the necessary correspondence documents that were developed post-submission of the planning application.

Table 9.1: Consultation Summary

Organisation	Date of Consultation	Summary of Consultation
Vale of Glamorgan Council	01/03/2024	Additional comments were made within a committee report regarding updated ecological documents. The council's ecologist confirmed that the updated PEA had been amended to cover previous points and species management objectives were fine. The council's ecologist stated that bat flight lines should be designated as dark corridors when preparing detailed lighting strategies and plans
	4/01/2023	All noteworthy ecological receptors have been appropriately dealt with A planning condition should include a badger sett creation feasibility study to understand potential for an artificial badger sett to be created A European Protected Species licence will be required from Natural Resources Wales The SEWBReC data search should be refreshed and an update to mitigation and enhancement proposals to reflect the results
	11/01/2021	Consideration should be given to undertaking bat surveys of the rest of the land in ownership of L&G Quantification of the area of scrub/coppice and length of hedgerows to be planted Contingency bat mitigation if the units including bat mitigation measures are not brought forward early in development process A bat mitigation strategy should be conditioned as part of planning application An overall lighting strategy particularly for the spine road to assess impacts on bats and other nocturnal mammals A 10 year management plan is to be agreed
	07/01/2020	Ecological mitigation for farmland and ground nesting birds should be addressed Replacement for loss of a waterbody on site should be included Hedgerow replacement should be provided for loss of hedgerows on site Proposed bird boxes should not be erected on ash trees

Organisation	Date of Consultation	Summary of Consultation
Natural Resources Wales	01/03/2024	The consultation responses were included within a committee report. NRW stated that the submission of an updated Precautionary Dormouse Strategy should be a condition of the development Including the submission of an updated Biodiveristy Management Strategy.

9.4 Scope of the Assessment

9.4.1 In summary, the scope of this impact assessment is to consider the likely effects of the Proposed Development upon sensitive ecological identified within the Site and in the wider area (where appropriate) identified during the ecological survey and assessment work and associated data collection.

Potentially Significant Impacts and Effects

9.4.2 The following assessment elements are considered to have the potential to give rise to likely significant effects during construction of the Proposed Development and are considered within this ES.

- Permanent and temporary habitat loss of Priority Habitats;
- Alteration or degradation of Priority Habitats (ancient/semi-natural woodland, hedgerows and watercourses);
- Alteration or degradation of Sites of Importance for Nature Conservation (SINC);
- Habitat loss and fragmentation disrupting connectivity, species migration, dispersal and breeding;
- Direct injury and mortality of protected and/or notable species;
- Displacement and disturbance including visual, noise and vibration and lighting.

9.4.3 The following assessment elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Development and are considered within this ES.

- Disturbance from operational use including noise and vibration, visual and lighting;
- Direct injury / mortality from vehicular collision.

9.5 Assessment Methodology

9.5.1 This Ecological Impact Assessment (EcIA) has been undertaken with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment CIEEM, 2018). The assessment is based on the Proposed Development footprint as defined in Chapter 2 and illustrated on the Site Boundary Plan.

9.5.2 This chapter details the analysis and assessment of likely significant effects predicted to arise from the Proposed Development on the following categories of ecological receptors:

- Non-statutory designated sites;
- Priority Habitats and Species; and
- Protected and notable habitats and species.

9.5.3 The assessment will determine the potential effects arising from the construction and operational phases of the Proposed Development on Important Ecological Features (IEF) (as defined below), both with and without consideration of secondary mitigation measures.

9.5.4 A significant effect is defined as an effect that could have an impact upon the structure, form, function and conservation status of a designated site, habitat and ecosystem or species

population where these are defined as IEF. The relative importance of ecological features will be valued against a geographic frame of reference.

9.5.5 The importance and value of an ecological feature is determined on a geographical scale as follows:

- International (within Europe);
- National (UK, relating to Wales);
- County (Vale of Glamorgan);
- District (Barry);
- Local;
- Site (i.e within the boundary of the Proposed Development); and
- Negligible.

9.5.6 The geographical scale of importance for statutory and non-statutory designated sites is assigned based on their designation. For example, internationally designated sites and Ramsar sites are considered of international importance, because they are designated on the basis of supporting habitats and / or species which are of importance for nature conservation at an international / European level. Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR) are of 'National' importance because they are designated for supporting habitats, species, and other features of importance for nature conservation at a UK level.

9.5.7 The geographical scale of importance for habitats and species is assigned with reference to all designations or policy provisions that apply. For example, Priority Habitats as identified by the provisions of Section 7 of the Environment (Wales) Act 2016, are considered of particular importance to the conservation of biodiversity in Wales. That is not to say that all Priority Habitats are considered of 'National Importance'. Extents of such habitats that form an appreciable part of the Welsh resource, would however be considered of 'National Importance'.

9.5.8 The same approach applies to protected or otherwise notable species. For example, great crested newt *Tritutrus cristatus* are recognised as a priority for nature conservation at a European (International) level, by way of their identification as a European Protected Species (EPS) under the Habitats Regulations. Very large populations that make up an appreciable proportion of the European population might rightly be identified as of 'International Importance'. Smaller populations that are not exceptional or remarkable in the locality they occur and do not contribute particularly to the maintenance of wider populations would be of lesser importance.

9.5.9 The geographical scale of importance for habitats and species is therefore subjective, with the following factors taken into account:

- Legal protection;
- National and local planning policy;
- Distribution including relative to the Proposed Development footprint;
- Conservation status (i.e., is the habitat/species common and widespread, or rare with a highly localised distribution); and
- Historical trends (where available).

9.5.10 For the purposes of this assessment, ecological features of 'Local' importance or higher are assessed as being IEFs that can therefore experience significant effects. Ecological features of 'Site' importance are not considered sufficiently important to experience significant effects and are not assessed as being IEF and therefore do not fit into a geographical scale. This includes common and widespread species and habitats that are not of conservation interest and are valued lower than those at the Local level and hence cannot experience significant effects. Professional judgement is used to determine if an effect is significant or not in relation to its importance, which is based on the geographical frame of reference. Effects may be assessed as significant at a lower geographical scale depending on the impact and resilience of a

receptor. As an example, short-term impacts on a breeding bird assemblage assessed as district importance may be assessed as being significant at a local scale of importance based on the nature of impact.

9.5.11 As per best practice guidance, it is not necessary in an assessment to address all ecological features with potential to occur, and instead attention should be focused on those that are of relevance (CIEEM, 2018). Guidance makes it clear that it is unnecessary to 'carry out detailed assessment of ecological features that are sufficiently widespread, threatened and resilient to project impacts and will remain viable and sustainable'. This does not mean that certain ecological features have been overlooked and appropriate measures to safeguard biodiversity more widely have been considered as part and not excluded.

9.5.12 Impacts are characterised with reference to a number of factors such as magnitude size of impact), extent, duration and reversibility of an effect are also included, whereby duration is the time in which an impact is expected to last prior to recovery or replacement of the feature and reversibility is whether an impact is temporary or permanent. Duration of an impact in this assessment is defined as the following, short-term – up to one year, medium-term – up to 10 years, long term – over 10 years).

9.5.13 Mitigation within the site design has been developed on an iterative basis for the Proposed Development, preference is first given to avoiding effects, then minimising and reducing remaining effects, before applying targeted mitigation where necessary. Where residual effects remain after application of targeted mitigation measures, compensation will then be considered. Inherent design measures and other mitigation considered to be embedded have been set out before the assessment of impacts and effects. Following this assessment, additional mitigation has been summarised. Residual effects are then reported. Mitigation measures for species that do not qualify as IEF but are afforded legal protection under specific pieces of legislation has also been set out in the additional mitigation section.

9.5.14 Ecological monitoring and maintenance will be key to the success of the proposed mitigation. Given that the Proposed Development is at outline stage, monitoring is not included in detail. Monitoring details would be further developed as the design of the Proposed Development progresses, though it is acknowledged that monitoring is an important part of mitigation success.

9.5.15 A matrix-based outcome has not been used in this ES as EcIA guidance (CIEEM, 2019) discourages the use of an assessment matrix to ascertain significant residual effects. To provide context across the EIA, Table 9.2 below sets out how an effect is classified in other ES chapters and how it might relate to the CIEEM EcIA Guidelines, based on professional judgement and drawing influence from supplementary EcIA guidance (Box et al, 2017). Significant residual effects will be qualified with reference to the appropriate geographical scale at which the effect is predicted to be experienced.

Table 9.2: Relating EIA Significance Used in Other Chapters to CIEEM's EcIA Guidelines

EIA Significance Terminology		CIEEM EcIA Terminology and Description of Effects
Significant (beneficial)	Major beneficial	Positive/beneficial effect on conservation status of an Important Ecological Feature at a National or International scale
	Moderate benficial	Positive/beneifical effect on conservation status, structure, form or function of an Important Ecological Feature at Regional, County or District scale
Not-significant	Minor benficial	Positive/beneficial effect on conservation status, structure, form or function of an Important Ecological Feature at a Local or Site scale
	Negligible/neutral	No effect on structure, form, function or conservation status of an Important Ecological Receptor
	Minor adverse	Adverse effect on structure, form, function or conservation status of an Important Ecological Feature at a Local or Site scale
Significant (adverse)	Moderate adverse	Adverse effect on structure, form, function or conservation status of an Important Ecological Feature at a Regional, County or District scale
	Major adverse	Adverse effect on structure, form, function or conservation status of an Important Ecological Feature at a National or International scale

Baseline Data Collection

Desk Study

9.5.16 Desk-based assessments have been undertaken to support data collection for the Proposed Development. Desk-based assessments have included requests for historic biodiversity records, made to South East Wales Biodiversity Records Centre (SEWBReC). A search for records of designated sites and protected and notable specie was requested within a 2 km buffer of the Site was requested in January 2023. The request included non-statutory designated sites, Ancient Woodland, Priority Habitats and Species, internationally and nationally protected species, species protected by planning policy and species of local conservation interest. An additional request for protected and notable species and non-statutory designated sites within 1 km of the site was made in July 2024. The additional data was requested to supplement the 2023 data. Freely available datasets from DataMapWales were accessed to search for Priority Habitats. The desk study assessments were undertaken as part of the most recent PEA (RPS, 2024[a]) which is in Appendix B.

Field Surveys

9.5.17 Multiple habitat surveys have been undertaken at the Site since 2018. The most recent was an extended habitat survey carried out over several visits between August 2023 and June 2024 to inform an updated Preliminary Ecological Appraisal (RPS, 2024[a]). The survey followed a hybrid methodology using habitat types from Joint Nature Conservation Committee's (JNCC) Phase 1 Habitat Survey Methodology (JNCC, 2016) and elements of UKHab's Habitat Classification survey methodology (UKHab, 2021). The habitat survey was carried out on accessible land within the Site including publicly accessible land and land controlled or otherwise accessible to the Applicant. This included an additional area to the east of the Site, referred to in the PEA as the Survey Area.

9.5.18 The PEA, which had due regard to best practice CIEEM guidance (CIEEM, 2017), was finalised in August 2024. The PEA report provides a factual assessment of the ecological baseline relevant to the Proposed Development. This has been used to identify those ecological features which could be subject to significant effects and hence are likely to be relevant to the Proposed Development.

9.5.19 Alongside the PEA, various ecological surveys and assessments have been carried out targeting selected ecological receptors between 2023 and 2024. These surveys included:

- Bat emergence, activity, and tree inspection surveys (August 2023 – June 2024);
- Dormouse surveys (September – November 2023);
- Otter and badger surveys (September 2023 and May 2024);
- Breeding bird surveys (March – June 2024); and
- Great crested newt eDNA sampling (April 2024).

9.5.20 All survey results are documented in the Protected Species Report (RPS, 2024[b]) in Appendix 9.1. Other surveys (including previous habitat surveys) and assessments that were undertaken between 2019 and 2023 to support the Proposed Development have also been used to inform the assessment in this ES (where appropriate) (RPS, 2018, 2019[a] and 2023). Survey reports for surveys undertaken prior to 2023 have not been included within the appendices but are referred to in this chapter to provide context on the ecological baseline. The reports were submitted as part of the Proposed Development's planning application submission. The above surveys were broadly similar in design to those undertaken in 2019.

Notes and Assessment Assumptions

9.5.21 Detailed construction information is not yet available for the Proposed Development as the project is still at outline stage. This assessment therefore draws on professional experience and assessment information of other projects of a similar nature.

9.5.22 Air quality impacts have been scoped out of the Environmental Impact Assessment. No air quality modelling of emission of nitrogen oxides (NOx) has been undertaken, and the climate change chapter of the Environmental Statement refers only to carbon dioxide (CO_2) emissions. On this basis, it is assumed that the Proposed Development is unlikely to lead to a significant increase in emissions of NOx. As a result, air quality impacts on habitats and nature conservation designations (as a result of NOx emissions) are considered to be insignificant.

9.5.23 It is assumed that the Proposed Development would be constructed in phases, as such certain parcels of land would remain as per the existing baseline whilst other areas would be developed at different stages. The phasing of the Proposed Development is unknown at this stage.

9.5.24 It is assumed that the creation and enhancement proposals within Area A would commence at the outset of construction. It is also assumed that additional mitigation measures for creation and enhancement measures proposed within Area B would also commence at the outset of the construction phase.

9.5.25 No Impact pathways between statutory designated sites of national and international importance and the Site that could give rise to likely significant effects have been identified. This conclusion is based on the distance between the Site, principally Area A and statutory designated sites of national and international importance. No international sites are present within 2 000 m of the Site and the nearest nationally designated site to the main construction area of the Proposed Development is more than 500 m. As such, these receptors are excluded from the assessment.

9.5.26 Impacts and effects within this chapter have been assessed considering the development of the Rapid Transport Corridor, which is situated in the west of the Site. This is to ensure that a realistic worst-case is assessed. It should be noted that the Applicant has no control over the certainty of construction of the Rapid Transport Corridor and the area may remain as 'safeguarded land' (i.e. no change in land use) for the duration of construction and operational phase of the Proposed Development. As such, the negative effects presented in this ES, would be reduced given the reduction in habitat loss. This would then lead to a greater positive change in the assessment of residual effects for some receptors.

9.6 Study Area

9.6.1 Study Areas incorporating Area A were identified in 2018 and refined to include Area A and Area B (the Site) in 2024 to inform the extent of the PEA. The application site as defined in Chapter 2 Site Description and Development Proposals is defined by the red line on CD0064-001-D-210331 Site Boundary Plan. This encompasses the proposed infrastructure development and the associated green infrastructure referred to as Area A in this assessment and the proposed extension to Porthkerry Country Park referred to as Area B.

9.6.2 The study areas comprised a number of different distance buffers per ecological receptor. The following study areas were considered for the purpose of this ES:

- Within 2 km of the Site for statutory and non-statutory designated sites.
- Within 2 km of the Site for priority habitats and ancient woodland.
- Within 2 km of the Site for protected and notable species.
- Within the Site for the purposes of habitat and further ecological surveys (and extended Survey Area, as referred to in the 2024 PEA).

9.6.3 These study areas have been developed based on standard good practice produced by CIEEM (CIEEM, 2017) (CIEEM, 2018) (CIEEM, 2020) in addition to professional judgement and to ensure the potential Zone of Influence (ZoI) for the Proposed Development are appropriately covered.

9.6.4 The ZoI for the Proposed Development is the area over which ecological features may be affected by biophysical changes because of the activities associated with Proposed Development (CIEEM, 2018).

9.7 Baseline Conditions

9.7.1 This section outlines the ecological baseline of the Site which has been obtained from ecological survey and assessments undertaken to support the Proposed Development, primarily those surveys and assessments undertaken between 2023 and 2024 (RPS, 2024[a,b]). Information obtained from ecological surveys undertaken at the Site between 2018 and 2019 have also used to inform this assessment.

9.7.2 The survey data obtained from surveys undertaken in 2018 and 2019 (RPS, 2018 and 2019[b]) have been reviewed as per CIEEM's advice note on the lifespan of ecological reports and surveys (CIEEM, 2019). The validity of pre-existing survey data has been assessed by way of two updated PEAs, to ascertain if significant changes have occurred. Given most of the habitats within the Site have not changed significantly (with the exception of four arable farmland parcels), it is considered that the data remains appropriate to support the assessment in this ES. It should be noted that this data is used to supplement updated ecological survey information to support the assessment in this ES and has not been solely relied upon.

Designated Sites

9.7.3 There are no statutory sites of international importance within 2 km of the Site.

9.7.4 A total of five statutory designated sites and 23 non-statutory designated sites were identified within 2 km of the Site. The statutory designated sites include three Sites of Special Scientific Interest (SSSI) and two Local Nature Reserves (LNR). All five sites were located outside of the Site. The 23 non-statutory designated sites were all Sites of Importance for Nature Conservation (SINC), of which four were located within the Site. All designated sites are listed in Table 9.3 and 9.4 below, along with their distances from the Site. All designated sites are illustrated on Figure 2 of the PEA (in Appendix 9.1).

9.7.5 It should be noted that there are two SINCs within the Site with similar names, these are North Bullhouse Brook SINC and North West Bullhouse Brook SINC. Both SINCs are designated for woodland features but are separate sites and do not overlap.

Table 9.3: Statutory Designated Sites within 2 km

Site Name	Approximate Distance to Site	Designation
Coedydd y Barry / Barry Woodlands	235	SSSI
Cliff Wood – Golden Stairs	265	SSSI
Cliff Wood – Golden Stairs	250	LNR
Cwm Talwg Woodlands	1990	LNR
Fferm Walters	2000	SSSI

Table 9.4: Non-Statutory Designated Sites within 2 km

Site Name	Approximate distance from the Site (m)	Designation
North West Bullhouse Brook	Within	SINC
North Bullhouse Brook	Within	SINC
West of the Old Rectory	Partially within	SINC
South West of Church Farm	Within	SINC
Porthkerry	Adjacent to the SIte, South	SINC
Knock Man Down Wood	Adjacent to the Site, South East	SINC
North East of Knock Man Down Wood	500 m East	SINC
North Cwm Barri	500 East	SINC
South of Cwm Ciddy Farm	525 East	SINC
Rhoose Point	720 South West	SINC
Land North of Blackton Farm	750 North	SINC
Church Hill Wood	1000 North	SINC

Site Name	Approximate distance from the Site (m)	Designation
Walters Farm	1300 North East	SINC
West of Barry College	1450 North East	SINC
Sutton Wood	1450 North	SINC
Curnix Farm	1550 North	SINC
Land South of Curnix Farm	1580 North West	SINC
Readers Way Pond	1600 West	SINC
Land South West of Curnix Farm	1700 South	SINC
Land South of Penmark	1700 North West	SINC
North West of Welsh Hawking Centre	1760 North East	SINC
Font-y-Gary	1800 West	SINC
Land North of Penmark	1950 North	SINC

Priority Habitats and Ancient Woodland

9.7.6 Eight Priority Habitat types (as listed on Section 7 of the Environment (Wales) Act 2016) and a total of 25 ancient woodland parcels were identified within 2 km of the Site. Of the Priority Habitats identified, three were identified within the Site, this included lowland mixed deciduous woodland, hedgerows and running water.

9.7.7 Of the 25 ancient woodland parcels identified, three were identified within the Site. Two of the ancient woodland parcels extended beyond the Site boundary, to the south and south east. All Priority Habitats and ancient woodlands are illustrated on Figures 2 and 3 of the 2024 PEA (RPS, 2024[a]) in Appendix 9.1. The ancient and semi-natural woodland habitat were primarily the ash-oak-hazel woodland type.

9.7.8 Notwithstanding the declining conditions of some of the ancient woodlands within the Site, they are irreplaceable habitats, noteworthy in Welsh policy (PPW, 2024) and qualify as lowland mixed deciduous woodlands as listed on Section 7. Semi-natural broadleaved woodland recorded within the Site qualifies as a lowland mixed deciduous woodland listed on Section 7 and forms connectivity to proximal ancient woodlands. Taken together ancient and semi-natural broadleaved woodlands are considered to be of up to county importance.

9.7.9 Species-rich, species-poor and defunct hedgerows and hedgerows with trees were present within the Site. Most of these habitats were managed up to two times within the course of a 12-month period and reached up to two metres in height and width included several species-rich hedgerows. Many hedgerows were well connected across the Site, with the only gaps in most of the hedgerows being farmyard gates. None of the hedgerows qualify as important as per Schedule 1 of the Hedgerow Regulations 1997. The hedgerow network present within the Site is considered to be important at up to a district scale.

9.7.10 Two slow flowing streams were recorded within the Site, Bullhouse Brook (in the west) and Whitelands Brook (in the east) and are both situated within woodland habitats for most of their length. Together they total approximately 1100 m of running water. More than 90% of both watercourses were located within Area B with only a short section of Whitelands Brook in Area A. A dry section of Bullhouse Brook and its woodland shelter are component parts of the North West Bullhouse Brook SINC, in the north west of the Site.

9.7.11 Whilst the watercourses qualify as Section 7 Priority Habitats they have been heavily modified from agricultural inputs and trampling from domesticated animals. They are considered to be important at up to a local scale.

Common and Widespread Habitats

9.7.12 The Site is divided into broad land use parcels for the purpose of the Proposed Development's planning application submission. Habitats identified within the Site) and additional areas within the Applicant's landholding are illustrated on Figure 3 of the 2024 PEA (RPS, 2024[a]). The Site

and area within the Applicant's landholding is collectively referred to as the Survey Area in the 2024 PEA.

9.7.13 Area A is primarily made up of a working farm that comprises rotational cropland (both cereal and non-cereal), grazing pasture for cattle and sheep and improved grassland used for hay/silage. The non cereal croplands were parcels of wildflower species with different parcels having one or two abundant species.

9.7.14 Other habitats within Area A include broadleaved woodland, connecting species rich and species-poor hedgerows, intermittent patches of dense scrub, and slow flowing watercourses. Individual trees, most commonly ash *Fraxinus excelsior* and hybrid black-poplar *Populus x canadensis (P. deltoides x nigra)* trees, were primarily located in the western half of Area A. All the individual ash trees identified within Area A have retrenched and have varying levels of decay as a result of ash dieback disease. Additionally, three of the trees are dead and one is severely decayed, with parts of its existing canopy lying on the ground.

9.7.15 A farmhouse (referred to as the Farmhouse) and a series of partially connected farm buildings including brick, wood and metal barns used for machinery storage and cattle shelter (referred to as the Barn Complex) are located near the northern boundary of Area A.. The farm buildings are bordered to the north and south by coniferous trees and intermittent stands of tall ruderal plants. All farm buildings are in the north of the Site, just off Port Road.

9.7.16 A relatively small, individual concrete lined waterbody was located adjacent to the farm buildings to the west, the waterbody was not considered to be of Priority Habitat status due to its artificial nature and poor condition.

9.7.17 Area B comprises a slightly similar habitat make up to Area A, though a number of parcels were identified as being slightly less agriculturally improved.

9.7.18 A total of 19 broad habitat types were recorded within the Site (and Survey Area) which are summarised in Table 5 below, along with their respective areas/lengths.

Table 9.5: Habitat Types within the Site and wider PEA Survey Area

Habitat Type (and corresponding JNCC code)	Area (ha)	Length (m)
A1.1.1 - Broadleaved semi-natural woodland	13.09	-
A2.1 - Dense Continuous Scrub	1.20	-
A3.2 - Coniferous Parkland/scattered trees	0.04	-
B4 - Improved Grassland	45.74	-
B4/C3.1 - Improved Grassland/Other Tall Herb and Fern - Ruderal Mosaic	1.23	-
B6 - Species-poor Semi-improved Grassland	4.59	-
C3.1 - Other Tall Herb and Fern – Ruderal	0.01	-
G1 - Standing Water	0.01	-
J1.1 – Arable	40.21	-
J1.2 - Cultivated/disturbed land - amenity grassland	0.04	-
J3.6 – Buildings	0.30	-
J4 – Bare Ground	0.42	-
A3.1 - Broadleaved Parkland/Scattered Trees	-	93.29
G2 - Running Water	-	1091.80
J2.1.1 - Intact Hedge - Native Species-rich	-	6091.66
J2.1.2 - Intact Hedge – Species-poor	-	1486.28
J2.2.2 - Defunct Hedge - Species Poor	-	566.77
J2.3.1 - Hedge with Trees - Native Species-rich	-	521.30
J2.3.2 - Hedge with Trees	-	1165.38
J2.4 – Fence	-	669.10

J2.6 - Dry Ditch	-	273.37
Total	**106.88**[1]	**11958.95**[1]

9.7.19 The primary difference in the habitat composition between the 2019 and 2024 PEA is the change in species make-up of four arable farmland parcels, the nature of the intact hedgerows, and management changes in some of the grasslands.

9.7.20 Four of the arable farmland parcels in Area A have changed from cereal croplands to non-cereal, native and non-native wildflower croplands. These parcels now comprise a combination of sainfoin *Onobrychis viciiifolia*, oxeye daisy *Leucanthemum vulgare*, chicory *Cichorium intybus*, cornflower *Centaurea cyanus* and corn marigold *Glebionis segetum* amongst other arable coloniser species. Several intact hedgerows have now been identified as species-rich due to number of woody species recorded and associated hedgerow ground flora, as per the Hedgerow Survey Handbook (Defra, 2007). Detailed information of all habitats identified within the Site (and wider Survey Area) is located within section 3.2 of the most recent PEA (RPS, 2024[a]), in Appendix 9.1.

9.7.21 Improved grasslands and arable farmland are common and widespread not just across the Vale of Glamorgan but the whole of Wales and the UK and are of less than local importance. Similarly, scattered broadleaved trees, scattered coniferous trees, patches of tall ruderal, species-poor semi-improved grasslands and dense scrub are considered to be important in the context of the Site.

9.7.22 Buildings and other urban features, bare ground, amenity grassland and the individual waterbody onsite are considered to be of negligible conservation importance, due to their low intrinsic value as habitat types and features.

Protected and Notable Species

9.7.23 Multiple ecological surveys and assessments have been undertaken at the Site which have identified presence or potential presence of protected and notable species, including suitable habitats supporting these species. Most of the species surveys have targeted Area A, with additional bat activity surveys extended to Area B.

Bats

9.7.24 A total of 38 records of bats were identified as part of biodiversity records provided by SEWBReC within the Study Area. Historically, six records of bat roosts have been recorded within the Study Area. As per the 2019 PEA (RPS, 2019[a]), this included a common pipistrelle maternity roost outside of the Site, to the south, within Porthkerry Country Park.

9.7.25 The historic records comprised 10 species of bat which included common pipistrelle *Pipistrellus pipsitrellus,* soprano pipistrelle *Pipistrellus pygmaeus,* brown long-eared *Plecotus auritus*, noctule *Nyctalus noctule*, Leisler's bat *Nyctalus leislerii,* whiskered *Myotis mysticanus*, Natterer's bat *Myotis nattererii,* serotine *Eptesicus serotinus*, Daubenton's bat *Myotis daubentonii* and an unidentified *Myotis* species. The nearest bat record was of a soprano pipistrelle recorded 84 m from the Site. All historic records of bats within 2 km of the Site can be viewed in the desk study section of the updated PEA report (RPS, 2024[a]).

9.7.26 The Site comprised habitat features, interfaces and mosaics that support optimal suitability for commuting and foraging bats, particularly connected hedgerows and broadleaved woodland. Some of the taller grasslands and wildflower croplands also provide suitability for commuting and foraging bats due to their floral resource attracting invertebrates. The Barn Complex and Farmhouse structures were considered to support potential roosting features for bats. Metal

[1] Total areas and lengths relate to the Site, and additional area within the Applicant's landholding, defined as the Survey Area in the PEA report (RPS, 2024[a])

barn buildings, particularly those abutting the brick barns were considered exposed and unlikely to support roosting bats.

9.7.27 Surveys of trees undertaken in 2019 confirmed the presence of roosting bats in Tree 1, Tree 10, Tree 22 and Tree 25 as per drawing number 3 within the Ecology Surveys Report (RPS, 2019[a]). Individual noctules were recorded in Tree 1 and Tree 10, an individual common pipistrelle was recorded emerging from Tree 22. An unknown *Pipistrellus* species was recorded emerging from Tree 25. Emergence surveys that were undertaken to support the Proposed Development in 2019 recorded the confirmed presence of soprano pipistrelle *Pipsitrellus pygmaeus* in four structures forming part of the Barn Complex in the north of the Site. Additionally, two common pipistrelle were recorded emerging from the Farmhouse. Barn Complex and Farmhouse structures were considered to be day roosts for common and soprano pipistrelle.

9.7.28 Emergence surveys of buildings in 2023 and 2024 confirmed the continued presence soprano pipistrelle day roosts in the Barn Complex structures, with the addition of a feature used by a common pipistrelle on the eastern gable of Structure A. A common pipistrelle day roost was also confirmed in the Farmhouse building, with common pipistrelle recorded emerging from the western gable end and the Farmhouse's southern elevation. Emergences were recorded in August and September 2023, with only one emergence recorded in the Barn Complex in 2024. The Farmhouse is potentially used on an intermittent basis in the pre-hibernation transitional period by one or two common pipistrelle.

9.7.29 Additionally, three trees within and in proximity to Area A were identified as confirmed bat roosts as part of ground level and aerial inspection surveys, these were Tree 5, Tree 10 and Tree 25. Trees 5 and 10 were confirmed noctule day roosts, though the roosts may be used as mating roosts by males in the summer. Tree 25 was identified as supporting a common pipistrelle day roost. Bats were only recorded once during the surveys in each of the identified trees. Given the frequent roost switching behaviour associated with tree dwelling bats, it's likely that the features identified in tree roosts are used at various points throughout the year.

9.7.30 In 2019 much of the bat activity across Area A was of common and soprano pipistrelle, with noctule and *Myotis* sp. recorded relatively infrequently. Frequent use of the woodland-hedgerow interface in the west of Area A by common and soprano pipistrelle was identified. Both species were recorded commuting and foraging in all directions across the active period. The woodland along the east of Area A, proximal hedgerows extending to the north and the northern boundary along Port Road were also identified as habitats frequently used by common and soprano pipistrelle. Lower activity was recorded within the centre of Area A, though soprano pipistrelle were recorded commuting along the central hedgerow extending to the Barn Complex. More than 4000 passes of common and soprano pipistrelle were identified as part of static recording surveys across the survey period.

9.7.31 The 2024 activity surveys recorded a similar level of activity, with much of the activity dominated by common and soprano pipistrelle. Noctules were recorded significantly less then common and soprano pipistrelle, but were found to be commuting over Area A during most survey visits. *Myotis* sp., serotine and brown long-eared were least frequently recorded with serotine restricted to the south east of Area A. As per the surveys undertaken in 2019, most of the activity was recorded in proximity to the woodland in the west of Area A, with common and soprano pipistrelles frequenting the hedgerow-woodland interface extending from the north and east of the woodland. Additionally, common and soprano pipistrelle were found to be frequently commuting and foraging along the woodland at the eastern boundary of Area A, continuing along the north-easternmost hedgerow to the wooded boundary off Port Road.

9.7.32 More than 5000 common pipistrelle bat passes and 1000 soprano pipistrelle bat passes in total were recorded as part of activity surveys, from locations within Area A and Area B. Whilst variation in activity was recorded across the months, August and September were found to be months of greatest activity from common and soprano pipistrelle. With the exception of peak activity of over 400 passes in August from *Myotis* sp, much lower levels of activity were encountered from other species across the survey period. This included activity from greater horseshoe *Rhinolophus ferrumequinum* (a species not recorded in 2019) which was identified

using the wooded boundary off Port Road in north east of Area A and the hedgerow extending to the east of North West Bullhouse Brook SINC.

9.7.33 Whilst common and widespread species make up much of the roosting resource (in low numbers) and commuting and foraging activity within Area A, species considered to be 'rarer' and 'rarest' as per Wray et al, (2010) in Wales have been identified. This includes roosting noctule (rarer) and commuting/foraging lesser horseshoe (rarer) and greater horseshoe (rarest). Though these species have been recorded in significantly lower numbers relative to common and soprano pipistrelle, the roosting, commuting and foraging bat population is considered to be of up to county importance.

Badger

9.7.34 A total of 12 records of badger *Meles meles* were identified as part of biodiversity records provided by SEWBReC within the Study Area, in the last 10 years. The most recent record was of a live sighting within the Site in 2022 by Porthkerry Wildlife Group.

9.7.35 Habitat suitable for supporting badger, in the form of woodland, grassland, scrub and hedgerows was present within the Site. Signs of badgers including footprints, latrines and live sighting have been identified within Area A during ecological surveys in 2019. Similarly, surveys in 2023 and 2024 identified mammal paths, push throughs and a footprint. Two live badgers were also recorded commuting along a tree line in the east of Area A in 2023.

9.7.36 Badgers are common and widespread across Wales. Badger is not identified as a Priority Species or included on the Vale of Glamorgan Council BAP. The legislation protecting them is in place largely for reasons of preventing animal cruelty rather than for conservation purposes. The badger population associated with Area A are not of any special local importance given the likely absence of main, annexe or other setts, limited activity recorded, suggesting the species is present in low numbers. As such, badgers are not considered to be an Important Ecological Feature and have been assessed of less than Local importance. Nevertheless, measures to ensure compliance with the legislation protecting them are likely to be required and are outlined in this assessment.

Otter

9.7.37 A total of 12 records of otter *Lutra lutra* were identified as part of biodiversity records provided by SEWBReC within the Study Area. The most recent record was a record of an otter inhabiting the southern limits of Whitelands Brook near the southern boundary of the Site.

9.7.38 The aquatic habitat within the Site is sub-optimal for otter, with much of Whitelands Brook being shallow with poaching interrupting the slow water flow in the south east. Similarly, Bullhouse Brook is slow flowing, narrow and parts of the channel are dry in summer. Whilst the aquatic habitat is sub-optimal, otters could use Whitelands Brook for commuting between the South Wales coast and larger, more diverse watercourses in the wider Study Area such as the River Waycock and Kenson River in the north. This is based on the recent records of otter in the south of the Site and historic record of a dead otter on Port Road. Based on the current condition of Whitelands Brook, it's unlikely to be used as a key area for the purposes of foraging.

9.7.39 The woodland surrounding Whitelands Brook, including other woodlands in the west and the south provide suitability for the creation of otter resting places and natal dens. Much of Area A is open, managed and provides limited cover for otter. No signs or evidence of otter were recorded during the targeted otter surveys in 2019, or updated surveys in 2023 and 2024.

9.7.40 Otter numbers have declined in Wales since 2010, with occupancy of sites falling from 90% to 70% between 2015 and 2019 (Keen and Chadwick, 2021). Otter is an EPS, it is listed under Section 7 of the Environment (Wales) Act 2016 and on the Vale of Glamorgan Biodiversity Action Plan. Otter is considered to be important at up to a county scale.

Water Vole

9.7.41 No records of water vole were identified as part of the desk study data provided by SEWBReC. Habitat for water vole is very limited within the Site. Whitelands Brook was heavily shaded for

most of its length, with evidence of trampling by domesticated animals in the south eastern section. A short section of Bullhouse Brook was less shaded and bounded by grassland, though banksides were almost flat and provided no opportunities for the creation of burrows. Whilst a targeted survey for water vole was not carried out, signs and evidence were searched for as part of the 2023 and 2024 surveys for badger and otter.

9.7.42 No impacts to water vole are anticipated as a result of the Proposed Development based on the very low likelihood that water vole are present. As a result, water vole is not considered further in this report.

Dormouse

9.7.43 One record of dormouse was identified in the biodiversity data obtained from SEWBReC within the Study Area. The record was located 1.2 km to the east of the Site.

9.7.44 Optimal habitat for dormouse was scattered across the Site, with much of the better quality habitat located in the north east and southern limits of Area A, and in Area B where woodlands are well connected (such as those proximal to South West of Church Farm SINC). As part of the farming approach at Model Farm, the hedgerows are left to develop until late summer, at which point they are flailed. The hedgerows are flailed again late autumn.

9.7.45 No dormouse nests, individuals or signs of dormouse were recorded as part of the 2019 nest tube surveys undertaken across Area A and parts of Area B, with *Apodemus* sp. recorded in several nest tubes.

9.7.46 Updated nest tube surveys undertaken in 2023 recorded the presence of an empty dormouse nest, in the north east of Area A, along the Site's eastern hedgerow. Dormouse presence was thus confirmed within Area A and assumed within Area B.

9.7.47 Dormouse numbers are rapidly declining across the UK, with recent numbers indicating that it is a species vulnerable to extinction (People's Trust for Endangered Species, 2022). Dormouse is an EPS, Section 7 species and listed on the Vale of Glamorgan BAP Combined with its limited distribution in the Vale of Glamorgan, dormouse is considered to be of up to county importance.

Priority Mammals

9.7.48 Four records of brown hare *Lepus europaeus*, and two records of harvest mouse *Micromys minutus* were identified as part of the desk study data obtained from SEWBReC. Additionally, 31 records of European hedgehog *Erinaceus europaeus* and 3 records of polecat *Mustela putorius* were obtained. With the exception of polecat, all other species have been recorded (based on desk study data) within or just outside of the Site.

9.7.49 Habitats within the Site provide suitability and commuting, foraging and breeding opportunities for all the priority mammals noted above, particularly woodlands, woodland edges, hedgerow borders and taller grasslands. Arable farmland also provides foraging opportunities for brown hare. Area A comprises primarily agriculturally managed habitats, an environment that is fairly common and widespread within the wider landscape and the Vale of Glamorgan.

9.7.50 An individual brown hare was recorded incidentally as part of habitat surveys undertaken in 2023, within a parcel of arable farmland in the north-west of Area A. An individual empty harvest mouse nest was recorded within a parcel of arable farmland in the east of Area A.

9.7.51 No other incidental recordings of brown hare or harvest mouse were identified. Additionally, hedgehog or polecat were not recorded during any of the surveys. These priority mammal species are considered to be of up to local importance.

Breeding Birds

9.7.52 More than 300 records of over 70 species were identified as part of the desk study data obtained from SEWBReC. Many of the species were protected and notable, including Schedule 1 birds listed on the Wildlife and Countryside Act 1981 (as amended).

9.7.53 Suitable breeding habitat was identified Site-wide for a range of breeding birds, with hedgerows, and bordering woodland and wooded habitats providing the main opportunities. Arable farmland offered a foraging resource, primarily non-cereal croplands. Several arable farmland parcels were also suitable for ground nesting birds, primarily skylark.

9.7.54 A total of 22 bird species were identified as part of breeding bird surveys undertaken in 2019. This included seven confirmed breeding birds, 17 probable breeders and 16 possible breeders within Area A. The confirmed breeding birds include blue tit *Cyanistes caeruleus*, great tit *Parus major*, starling *Sturnus vulgaris*, blackbird *Turdus merula*, dunnock *Prunella modularis*, house sparrow *Passer domesticus* and goldfinch *Carduelis carduelis*.

9.7.55 Of the 22 species identified nine of these species were notable species, which include:

- Six species listed on Birds of Conservation concern (BoCC) Wales Red List: yellowhammer *Emberiza citrinella*, linnet *Carduelis cannabina*, bullfinch *Pyrrhula pyrrhula*, starling, goldcrest *Regulus regulus* (formerly listed on the BoCC W Amber) and willow warbler *Phylloscopus trochilus;*
- Four species listed on BoCC Wales Amber List: house sparrow, song thrush *Turdus philomelos*, chiffchaff *Fringila coelebs* and skylark *Alauda arvensis;*
- Two species listed on the Vale of Glamorgan BAP: starling and linnet.

9.7.56 A total of 38 bird species were identified as part of surveys undertaken in 2024. This included 34 species for which breeding is likely sought within Area A and/or Area B and four species which are considered to be non-breeders. This included six confirmed breeding birds, 16 probable breeders and 30 possible breeders within Area A. The confirmed breeding birds include blue tit *Cyanistes caeruleus*, blackbird *Turdus merula*, dunnock *Prunella modularis*, house sparrow *Passer domesticus,* blackcap *Sylvia atricapilla* and wren *Troglodytes troglodytes.*

9.7.57 Of the 38 species identified the following were considered notable:

- Nine species listed on BoCC Wales Red List: yellowhammer, linnet, starling, willow warbler, whitethroat *Sylvia communis*, greenfinch *Chloris chloris*, grasshopper warbler *Locustella naevia,* rook *Corvys frugilegus* and herring gull *Larus argentatus;*
- Eight species listed on BoCC Wales Amber List: house sparrow, goldcrest, dunnock, coal tit, skylark, chaffinch, green woodpecker and lesser black-backed gull; and
- Three species listed on the Vale of Glamorgan Biodiversity Action Plan: starling, linnet and grasshopper warbler.
- Nine species listed as Priority Species under Section 7 of the Environment (Wales) Act 2016. These were skylark, grasshopper warbler, song thrush, dunnock, house sparrow, yellowhammer, starling, herring gull and linnet.

9.7.58 Of the notable species identified during the survey, grasshopper warbler was recorded once during the breeding bird survey, on the eastern boundary of Area A. The low number of grasshopper warbler is likely due to poor to sub-optimal habitat within Area A, with features limited to the eastern and south-eastern limits of Area A, and mostly within Area B. Goldcrest and yellowhammer were incidental recordings from other surveys undertaken within Area A. Yellowhammer was identified on the edge of Area A in the north east and goldcrest was heard singing on the edge of North West Bullhouse Brook SINC. Skylark song flight was recorded on multiple occasions during the surveys, with several individuals observed in the north west and east of Area A, perched on overhead electricity lines within arable farmland. Willow warbler and whitethroat were restricted to the south east in and southern limits of Area A with few territories recorded. A pair of linnets were observed flying over Area A.

9.7.59 Coal tit, green woodpecker were only recorded on one occasion. Wren was recorded most frequently and held the most possible and probable breeding territories.

9.7.60 During the March 2024 breeding bird survey a flock of approximately 30 finch species comprising goldfinch and linnet were recorded feeding within the southern limits of Area A, just to the north of North West Bullhouse Brook SINC within a non-cereal wildflower cropland.

9.7.61 All 34 species recorded within Area A (classed as possible, probably and confirmed breeders), were considered to be common or locally common resident breeders or breeding summer visitors as per the East Glamorgan Bird Report (Glamorgan Bird Club, 2021). All breeding species identified in the breeding bird assemblage within Area A are considered to be abundant, common of fairly common breeders in Wales (Welsh Ornithological Society, 2022). No species identified during the surveys were identified as scarce or included on national / regional rarities lists.

9.7.62 The breeding bird assemblage is typical of the type of environment identified within Area A (arable farmland, improved pasture, hedgerows and wooded fringes), with most species (with the exception of skylark) being most active within boundary features.

9.7.63 Given the distribution, abundance and diversity of species recorded, the breeding bird assemblage is considered to be of between local and district importance.

Amphibians

9.7.64 A total of 51 records of amphibians were identified as part of biodiversity records provided by SEWBReC within the Study Area. These included records of smooth newt *Lissotriton vulgaris,* palmate newt *Lissotriton helveticus*, common frog *Rana temporaria,* common toad *Bufo bufo* and great crested newt. Of the 51 records, four were of great crested newt, the closest record of great crested newt was more than 1500 m from the Site, to the west. The most recent record was of a common toad, identified in 2023 in the south of the Site.

9.7.65 Aquatic habitat for amphibians is limited within the Site, particularly for species such as great crested newt that have specific habitat preferences. Waterbodies are likely to be colonised by great crested newt if they allow for successful display and comprise suitable macrophytes for egg laying, surrounding cover for migration/dispersal and features for hibernaculum. The single waterbody located on the northern boundary of Area A was artificial and concrete lined with a surface cover common duckweed *Lemna minor* and unsuitable for great crested newt. No other waterbodies were recorded within the Site or within a 250 m search area.

9.7.66 Terrestrial habitat for great crested newt and other amphibians is present within the Site, mostly restricted to Area B and the southern and eastern limits of Area A (woodland fringes and scrub patches). Hedgerow bases within grasslands, woodland fringes and scrub patches provide shelter and hibernacula for amphibians.

9.7.67 Sampling for great crested newt eDNA within the waterbody returned a negative result in both 2019 and 2024 surveys. Given the lack of aquatic habitat, presence of dispersal barriers (Porthkerry Road, Port Road and Whitelands Brook) it is likely that great crested newt is absent from Area A. Other amphibians (excluding great crested newt) are considered to be important in the context of the Site.

Reptiles

9.7.68 A total of 88 records of reptile were identified as part of the desk study data obtained from SEWBReC within the Study Area, this includes records of grass snake *Natrix helvetica,* slow worm *Anguis fragilis* and adder *Vipera berus.* The closest record was of an adder 360 m to the south of the Site, in 2024.

9.7.69 Habitat suitability within the Site was primarily located in Area B and the southern fringes of Area A. Taller grasslands, scrub fringes and woodland edges provide suitable for reptile within Area A. Much of the improved grassland and arable farmland are managed habitats, with limited structure, variation, and ecotones. On this basis, no surveys were undertaken and reptiles were assumed to be present in low numbers, with reptile populations likely increasing in the south of the Site, within Area B. No incidental recordings of reptiles were observed during other species surveys and it is unlikely that important breeding populations are present within Area A.

9.7.70 Reptiles are considered to be important within the context of the Site.

Terrestrial Invertebrates

9.7.71 A total of 68 records of terrestrial invertebrate were identified as part of biodiversity records provided by SEWBReC within the Study Area. The most recent record was of the moth, cinnabar *Tyria jacobaeae* located 212 m to the south of the Site. Records of white ermine *Spilosoma lubricipeda*, buff ermine *Spilosoma lutea* and stag beetle *Lucanus cervus* were identified within the Site.

9.7.72 Suitable habitats are scattered within the Site, with much of the suitable areas confined to the non-cereal wildflower croplands (four parcels) within Area A, woodland parcels and woodland fringes along the southern limits of Area A and within Area B and poor semi-improved grasslands in the south, particularly South West of Church Farm SINC. Much of the grassland habitats within Area A were dominated by grasses, particularly those characteristics of agriculturally improved habitats. The diversity of forb species as foodplants was limited and restricted to the four parcels of non-cereal, wildflower croplands.

9.7.73 Whilst no terrestrial invertebrate surveys were undertaken, the non-cereal wildflower croplands supported several common and widespread species of terrestrial invertebrates. Incidental observations of the butterfly species brown argus *Aricia agestis*, large white *Pieris brassicae* and gatekeeper *Pyronia tithonus* were recorded within a non-cereal cropland in the north west of Area A. An individual wasp spider was also recorded in within this cropland. Additionally, larva of the moth species knotgrass *Acronicta rumicis* was identified within a non-cereal cropland in the east of Area A. Knotgrass is a Section 7 species, though its distribution is widespread across the UK and its considered to be a commonly encountered moth across most of the UK.

9.7.74 Terrestrial invertebrates are considered to be important within the context of the Site.

Vascular and Non-Vascular Plants

9.7.75 A total of 33 records of vascular and non-vascular plant species were identified in the desk study data obtained from SEWBReC within the Study Area. The closest was of a record of greater butterfly orchid *Platanthera chlorantha*, located within the Site, within Area B in the south east, in 2022.

9.7.76 Habitats within the Site were dominated by arable farmland and agriculturally improved grasslands, with several woodland parcels interspersed between grasslands. Hedgerows were frequent, and species-poor semi-improved grasslands were intermittently scattered in the south of the Site. Invasive non-native species of vascular plants are summarised in the invasive non-native species section below.

9.7.77 Whilst the habitat surveys were undertaken over the course of several days, no protected and notable species were identified within the grasslands or arable farmlands during the habitat survey. Soil fertility is likely too high within the improved grasslands to support persistent populations of protected and notable species within these habitats.

9.7.78 Woodlands were found to support one protected species, which was the Schedule 8 plant bluebell *Hyacinthoides non-scripta*. Whilst not protected or notable, the ancient woodland indicator species primrose *Primula vulgaris*, lords-and-ladies *Arum maculatum,* dog's mercury *Mercurialis perennis* and enchanter's nightshade *Circaea lutetiana* were identified. A species of currant *Ribes* sp. was also identified in one of the woodlands.

9.7.79 Vascular and non-vascular plants are considered to be important in the context of the Site.

Invasive Non-Native Species

9.7.80 A total of 32 records of invasive non-native species were identified in the desk study data obtained from SEWBReC within the Study Area. The closest was of a record of Japanese knotweed *Reynoutria japonica*, located 10 m from the Site.

9.7.81 Stands of Japanese knotweed were recorded in the north west and north east of Area Am within hedgerows just off Port Road during the habitat survey undertaken in 2024. Japanese knotweed is a species listed on Schedule 9 of the Wildlife and Countryside Act 1981. No other invasive

non-native species were identified during any of the ecological surveys and assessments of the Site.

9.7.82 Invasive non-native species are not considered to be important, but measures would be required as part of the Proposed Development's construction phase to prevent contravening wildlife legislation and the degradation of other habitats.

9.8 Future Baseline

9.8.1 It is expected that that the ecological baseline will remain unchanged in the short to medium term (at least the next five to 10 years) in the absence of the Proposed Development. It is also anticipated that the management of the Site will be maintained and continue as currently and will include the regular grazing and routine cutting of most of the grasslands within the Site. The agricultural land is likely to continue to be rotated annually with cereal and non-cereal crops and wildflower plants cultivated in most of the arable parcels. Invasive non-native species are likely to spread and colonise new areas.

9.8.2 It is anticipated that in the absence of the Proposed Development the Barn Complex and Farmhouse will continue to experience normal levels of wear and tear, with the Barn Complex likely falling into further disrepair in the long term. As such, some structures, primarily structures associated with the Barn Complex may gain additional ecological value and provide additional opportunities for bat roosting and opportunities for bird nesting and roosting, in the medium to long term. Equally, at some point in the long term these are likely to collapse and/or require repair, which could reduce/remove their suitability for roosting bats and birds.

9.8.3 It is also anticipated that the surrounding woodland SINCs and ancient woodlands will continue to be left unmanaged, resulting in a continuation in the decline of woodland health. This would be primarily as a result of decaying ash from ash dieback fungus *Hymenoscyphus fraxineus,* increased shading of the understory and ground flora as a result of maturing trees and denser canopies. The favourable conservation status of the woodlands is likely to reduce in the long term as a result. It is anticipated that the grassland forming part of the South of Church Farm SINC will continue to be managed by grazing and a late summer cut and is unlikely to change significantly in the medium term, assuming the current farming regime does not change.

9.8.4 Climate change is likely to alter the composition and distribution of species of some taxon groups in the long term (over the next 50-100 years). Research suggests that several groups, which are relevant to the Site would be subject to change, including bird species (Huntley et al 2008 and Pearce-Higgins, 2013). It is likely that range expansion and a northward shift in the distribution of some species and taxon groups will occur. Additionally, land is expected to become dryer with soils losing moisture which may lead to the complete drying of watercourses on the Site, particularly given their current water levels and recent evidence of drying.

9.8.5 It is important to recognise however, particularly in relation to birds, that these species are habitat-specific in relation to their life cycle requirements, and it is anticipated that the Site will remain predominantly a farmland environment in the long term in the absence of the Proposed Development. This habitat will remain at its current carrying capacity for populations of bird species and it is anticipated that the existing composition of bird species will remain similar.

9.9 Sensitive Receptors

9.9.1 Ecological features are those that are important and potentially affected by the Proposed Development. The table below sets out the sensitive receptors as defined in the baseline conditions section above, referred to as IEF, which have been assessed and which are of local importance or above (CIEEM, 2018).

Table 9.6: Summary of Important Ecological Receptors

Ecological Feature	Conservation Importance
Designated Sites	
Sites of Importance for Nature Conservation	County

Habitats	
Priority Habitats - Hedgerows	District
Priority Habitats – Running Water	Local
Priority Habtiats – Lowland Mixed Decidious Woodland and Ancient Woodland	County
Species	
Bats	County
Otter	County
Dormice	County
Priority Mammals – harvest mouse, brown hare, hedgehog and polecat	Local
Breeding Birds	Local-district

Receptors Scoped Out

9.9.2 Ecological receptors scoped out from further assessment are listed below. Receptors of Site value or less, or not considered to be at any risk of being significantly affected by the Proposed Development are not considered further in this ES. These receptors are:

- Common and widespread habitats;
- Great crested newt/amphibians;
- Water vole;
- Reptiles;
- Terrestrial invertebrates; and
- Vascular plants.

9.10 Development Design and Impact Avoidance

9.10.1 Within the context of EcIA, mitigation is one of the hierarchies of measures that are undertaken to prevent or reduce adverse impacts. This hierarchy is listed below and has been adapted from the Welsh Government's Step-wise Approach

- Avoidance: measures taken to avoid or prevent adverse impacts, for example the Proposed Scheme layout or timing of the site works;
- Minimisation: measures taken to reduce development footprint and landtake;
- Mitigation: measures taken to reduce adverse impacts, e.g. noise barriers; pollution interceptors;
- Compensation and offsetting: measures taken to offset significant residual adverse impacts, i.e. those that cannot be entirely avoided or mitigated to the point that they become insignificant. This would typically involve habitat creation or enhancement.

9.10.2 Embedded mitigation is an integral part of the Proposed Development design. Detailed information on embedded design measures is not currently available as the Proposed Development design is at outline stage. Areas have therefore been proposed for the provision of new and enhanced habitats. An indicative landscaping scheme and habitat creation and enhancement proposals for these areas are provided in the Outline Biodiversity Management Strategy (RPS, 2019[c]) and illustrated in varying degrees on the following plans:

- Figure 2.5 (of this ES) JCD0064-006-J-210607 Parameter Plan – Green Infrastructure;
- Figure 2.6 (of this ES) JCD0064-003-T-210511 Concept Masterplan;
- JCD0064-007 Hedgerow, Scrub and Woodland Plan.
- 210520_ECO01271-002 Rev A Proposed Additional Mitigation and Wildlife Enhancement

9.10.3 Other measures have been taken from species specific strategies and other documents submitted as part of the panning application submission that are considered to be embedded. The proposed landscaping scheme, green infrastructure and habitat creation and enhancement measures within Area A are considered to be embedded. Proposals for habitat creation and enhancement within Area B are discussed in section 9.11 and have been identified as secondary mitigation. The following measures are not exhaustive and additional elements may be developed as part of the detailed design stage of the Proposed Development. Additionally, it is reasonable to assume that environmental best practice will be adopted as part of the constructing and operational phases of the Proposed Development, even if those measures have not been defined in detail at this current stage:

- Avoidance and protection of all habitats of higher value including SINCs through implementation of a 15 m buffer between North West Bullhouse Brook SINC, its underpinning ancient woodland and the footprint of the built Proposed Development to prevent impacts and ensure protection of root protection area (RPA) of ancient woodland habitats. Vehicle tracking, stockpile storage, earthworks and other construction activity or equipment will be excluded from the protection buffer.
- Establishment of a 10 m buffer along all other semi-natural broadleaved woodlands in proximity to Area A. This buffer would be an exclusion zone to all forms of construction activity.
- Maximisation of hedgerow retention and minimisation of hedgerow severance to reduce breaks in connectivity and loss of existing habitat links. Replacement of all lost hedgerows within Area A.
- A Sustainable Drainage System (SuDS) will be delivered for the Proposed Development. This will ensure that the Proposed Development does not cause adverse effects to surface water receptors and prevents pollution run off into Whitelands Brook and Bullhouse Brook. Habitat creation and enhancement measures will be integrated as part of the SuDS that will include a wet grassland seed mix within the SuDS basins and a neutral grassland seed mix for the SuDS basin edges. Outline design information and management of SuDS is set out in document 210422 JCD0064 Cover Letter. Further information can be viewed in the Sustainable Drainage Assessment report (RPS, 2019[d]).

9.10.4 As referred to above a scheme for the implementation of landscaping and habitat creation is proposed within Area A. These embedded measures have been designed into the Proposed Development to reduce impacts and resultant effects. As referred to in the bullet points above, all hedgerows lost to the Proposed Development (which includes the Rapid Transport Corridor) will be replaced, with several hedgerows proposed for reinstatement in proximity to the areas of proposed removal. In addition, a new hedgerow extending more than 850 m in length is proposed in the north of the Site, forming a double hedgerow with the existing hedgerow just off Port Road. Hazel *Corylus avellana* would be the primary species planted within the replacement hedgerows alongside other native species, of local provenance.

9.10.5 In addition to the replacement of hedgerows, a series of new wooded habitats to include hazel scrub and mixed-species scrub planting, new woodland, rough and marshy grassland and a minimum of 9 individual broadleaved trees are proposed. Mosaics of scrub planting and grassland are proposed on the west and east of North West Bullhouse Brook, with a dark corridor, extending from the north. This corridor will include hazel scrub, woodland and a ditch network (forming part of the SuDS).

9.10.6 The embedded habitat creation measures are listed in Table 7 below.

Table 9.7: Indicative Areas and Lengths of Habitat Creation and Enhancement within Area A

Habtiat Type	Area (ha)	Length (m)
Proposed native woodland planting	1.25	-
Hazel dominated scrub	0.96	-
New mixed species scrub planting	0.17	
Swales / attentuation areas, meadow planting and wetland creation	2.13	-

Rough grassland	0.10	-
Areas Proposed for Open Space / Green Infrastructure	4.51	-
Species-rich hedgerows	-	2324
Total	**9.12**	**2324**

9.10.7 Whilst tertiary mitigation measures are not considered to be inherent design measures, they are inexorable forms of mitigation primarily as a result of legislative requirements. It has been assumed that tertiary mitigation measures will be delivered as part of the Proposed Development. A summary of tertiary mitigation measures, primarily as a result of confirmed bat and dormouse presence are set out below.

Bat Mitigation

9.10.8 The following elements will form the basis of a detailed method statement to accompany an EPS licence application for bats. The EPS licence will cover the loss of six pipistrelle day roosts which have been identified within the structures in the north of the Site and loss of up to three noctule day roosts in trees:

- Avoiding killing and injury of bats during building demolition, Site and vegetation clearance;
- Provision of bat roosting habitat within newly developed buildings;
- Avoidance of killing and injury of bats during construction of the Proposed Development.

9.10.9 The method statement will be submitted as part of the EPS licence application, will include a schedule of works that specifies tasks to be completed before the loss of the roosts.

9.10.10 Compensation measures will be required for the loss of these roosts, this will include (as a minimum):

- Incorporation of eight roosting tubes, bat bricks or other form of integrated roosting feature within suitably located new buildings away from artificial lighting and with connectivity to the southern or eastern boundary hedgerows/woodland;
- Incorporation of roosting cavities into the structures of new industrial buildings where practical for the nature and type of buildings being constructed; and
- Provision of ten 2F and five 3FF Schwegler bat boxes or equivalent on large trees within or on the edge of woodlands, facing southwards (on the west or east of Area A), and/or retained broadleaved trees. Bat boxes would not be deployed on ash trees.

9.10.11 It is anticipated that replacement roosting features (i.e. the Schwegler bat boxes) are to be installed prior to demolition of the farm buildings and clearance of trees. In the event that proposed new buildings are not constructed early in the construction phase, a contingency plan for the provision of new roosts will be implemented. This would include deployment of a further 13 bat boxes within suitable habitat (deployed on trees) in Area A and Area B over a six-year period.

9.10.12 Details of the species protection measures during the dismantling / removal of roost features in the farm buildings and the location of all the replacement bat roost features will be included in the prospective EPS licence application.

9.10.13 Any stripping of the roof or mortar on the Farmhouse or Barn Complex will be undertaken by hand, under the supervision of a Natural Resources Wales licensed bat ecologist or accredited agent. In the unlikely event that bats are found during this process, the licensed bat ecologist will relocate them to a suitable safe habitat.

9.10.14 All contractors must be briefed of the potential presence of bats and follow the licence holder's instructions and guidance. Suitable evidence of the completion and inclusion of recommended measures will be submitted to the local planning authority post development in the form of an email update from a suitably qualified ecologist.

9.10.15 Habitat provision for bats is described in section 9.11. Monitoring will be undertaken to ascertain the success of the implemented mitigation following the removal of existing roost features.

Dormouse Mitigation

9.10.16 The following elements will form the basis of a detailed method statement to accompany an EPS licence application for dormice and have been summarised following preparation of a Precautionary Dormouse Strategy. The EPS licence will cover the loss of and disturbance to hedgerow habitats:

- The woodland buffers (15 m and 10 m protection buffers) will protect all woodlands within Area A. The boundary of the protection buffers will be demarked with Heras fencing, or equivalent, to prevent unnecessary access or storage of materials within the buffer. This will be a minimum 15 m buffer from ancient semi-natural woodland and a minimum of 10m buffer from the wooded eastern boundary corridor along Whitelands Brook.
- The removal of hedgerows would be timed to occur outside the peak-breeding periods for dormice (i.e. late September onwards) or when dormouse would not be active in the canopy, such as during hibernation. Whilst dormice could potentially hibernate at the base of hedgerows, optimal suitability for hibernation is primarily located within woodlands and dense scrub habitats in the southern limits of Area A, and wooded habitats within Area B.
- Following a precautionary approach the hedgerow shrubs will be cut to close to 30cm above ground level over winter (between November and February) using hand-tools at a time of year when birds will not be nesting.
- Cut vegetation will be removed from site and not left within the application boundary, with the exception of materials used for enhancement features. Newly cut vegetation will be removed immediately as stacking this on site would potentially create suitable hibernacula for hibernating species.
- All ground beneath the hedgerows and the root systems will remain undisturbed until the end of hibernation; around the start of April (depending on weather) at which time dormice will be active.
- Hibernation features such as log piles, fallen trees and brash piles will be dismantled by hand during the dormouse active period (April-October) by a Natural Resources Wales licensed ecologist.

9.10.17 New planting will be undertaken in advance of removal of potential dormouse habitat, with additional planting to be undertaken during years three and five post construction. This will result in further extents of woodland and scrub habitats ensuring that there is increased connectivity between the retained areas of woodland and providing a long-term buffer between the habitat and development.

9.10.18 Species within the areas of scrub will include hawthorn, blackthorn, hazel, bramble and honeysuckle which will provide foraging resources. New woodland areas will be created with understories of hazel, blackthorn and hawthorn in addition to other native tree species such as oak. The retained and created habitats will be subject to ongoing low intervention management to promote and maintain their potential value for dormice (as well as wider biodiversity) in the long term.

9.10.19 Fifteen dormouse nest boxes will be installed across the woodland and scrub areas along the southern and eastern limits of Area A and within Area B.

9.10.20 Additional habitat creation for dormice (though secondary mitigation) is included within section 9.11.

9.11 Preliminary Assessment of Likely Impacts and Effects

9.11.1 This section details the assessment of significant effects taking account of embedded mitigation, but in the absence of secondary / additional and tertiary mitigation. Embedded mitigation which includes the inherent Proposed Development design including measures that have been developed to avoid impacts from the outset are set out below. Secondary / additional and tertiary mitigation for the Proposed Development is outlined in 9.11. It should be noted that the Proposed Development is at outline stage and as a result, detailed mitigation measures are

not available. Proposals for how certain mitigation measures should be developed to prevent or reduce a significant effect are included in the necessary sections.

Construction Phase

9.11.2 The Proposed Development would include the permanent removal of up to 14 ha of improved grassland and just over 19 ha of agricultural farmland to facilitate the construction of the Proposed Development. It is assumed that the landtake would also facilitate temporary construction compounds, construction access and locations of stockpiled material though the information is not yet known.

9.11.3 Scattered trees, primarily in the west and north of Area A are also anticipated to be cleared to facilitate the Proposed Development. All structures located in the north of the Site, just off Port Road will be demolished, along with the clearance of associated scattered coniferous trees that currently provide screening. Relatively minor areas of other habitats characteristic of disturbed environments such as bare ground will also be removed.

9.11.4 At present, it is uncertain how the phasing of the masterplan will be implemented but construction is anticipated to last for a period of up to 10 years (as per outline design information submitted as part of the planning application). It is anticipated that development parcels would be brought forward for construction at different stages rather than removal of all areas at once, with some parcels potentially being cleared and constructed together and others cleared and constructed in isolation. Based on this notion, it is assumed that some habitats will remain intact in various areas across Area A at different periods throughout the construction phase. Additionally, it is also assumed that the landscape and habitat creation and enhancement proposals would begin at the outside of the construction phase. These assumptions have been taken into account when assessing the impacts and effects.

9.11.5 Core construction working hours are not known but are assumed to be between 08:00 and 17:00, based on other developments of a similar nature.

Non-Statutory Designated Sites

9.11.6 No direct impacts to North West Bullhouse Brook SINC (which is the closest SINC to Area A) or any of its features are anticipated to be directly impacted as part of the construction of the Proposed Development due to embedded mitigation measures. Additionally, no direct impacts are anticipated on North West Bullhouse Brook SINC or South West of Church Farm SINC.

9.11.7 It is also anticipated that the SuDS will slow, capture and store surface water runoff during construction and assist in its infiltration to subsurface flow systems minimising erosion and potential for overland flow into both North West Bullhouse Brook and North Bullhouse Brook SINCs.

9.11.8 Whilst direct impacts would be avoided and surface-water run off can be mitigated through embedded mitigation, indirect impacts from dust emissions and accidental pollution incidents could occur. These negative impacts could lead to the alteration and degradation of North West Bullhouse Brook SINC and North Bullhouse Brook SINC. It is predicted that these effects would be significant adverse at a local scale in the absence of additional mitigation.

9.11.9 All other SINCs within the Study Area are more than 300 m from Area A and it is considered that construction related impacts on these sites would be negligible and not significant.

Priority Habitats – Hedgerows

9.11.10 The construction phase is expected to lead to direct, permanent loss of 1600 m of species-rich hedgerow and 400 m of species-poor hedgerow. This will include removal of entire lengths of hedgerow sections as a result of the spine road corridor, secondary access roads and Future Rapid Transit Corridor. Severance of smaller sections would also take place through the spine road and other access requirements. It should be noted that this is a worst-case prediction of hedgerow loss as part of the Proposed Development. It is likely that this number would be reduced as detailed design information becomes available.

9.11.11 Existing, retained hedgerows within Area A will be protected from all construction related activities by avoidance buffers to prevent damage and destruction. It should be noted that whilst avoidance buffers have been referenced in application documents, the sizes of these buffers from hedgerows have not been identified as part of the Proposed Development parameters. Nevertheless, it is assumed that buffers would be a minimum of 5 m from each hedgerow section, with significantly larger buffers within areas referred to as Proposed Open Green Space and areas running parallel to SuDS features. As part of the landscaping and green infrastructure proposals embedded into the Proposed Development design, all lost hedgerows within Area A will be replaced and all retained hedgerows will be enhanced. Whilst replaced hedgerows will not be reinstated in their existing location, many replacement hedgerows will be created in proximity to these locations.

9.11.12 Whilst direct impacts to existing, retained hedgerows would be avoided through embedded mitigation, indirect impacts through dust emissions and accidental pollution incidents could lead to the alteration and degradation of these features within Area A. Movement of soil could lead to the spread of invasive non-native species such as Japanese knotweed, which could outcompete native shrub species within existing hedgerows. It is anticipated that hedgerows within Area B are more than 50 m from the proposed construction footprint within Area A and are unlikely to be impacted by dust emissions (IAQM, 2024).

9.11.13 In the absence of additional mitigation, direct and indirect impacts to hedgerows are predicted to give rise to adverse effects that would be significant at a district scale.

Priority Habitats – Ancient Woodland / Semi-Natural Broadleaved Woodland

9.11.14 No direct impacts to ancient woodland or semi-natural broadleaved woodland within the Site is anticipated as part of the Proposed Development.

9.11.15 It is also anticipated that the SuDS will slow, capture and store surface water runoff during construction and assist in its infiltration to subsurface flow systems minimising erosion and potential for overland flow into the woodland habitats within Area A.

9.11.16 Whilst direct impacts are avoided and surface-water run off can be mitigated through embedded mitigation, indirect impacts from dust emissions and accidental pollution incidents could occur. These negative impacts could lead to the alteration and degradation of woodland habitats, particularly ancient woodland soils and ancient woodland indicator plants. It is predicted that indirect impacts from construction would be temporary, short to medium term and would give rise to significant adverse effects at a Site scale in the absence of additional mitigation.

Priority Habitats – Whitelands Brook and Bullhouse Brook

9.11.17 No direct impacts to either of the watercourses within the Site is anticipated as part of the Proposed Development. Both watercourses are located outside of Area A, with a small stretch (less than 10 m) of Whitelands Brook lying partially within. The watercourses will be adequately protected from construction activities within Area A.

9.11.18 The approved SuDS will slow, capture and store surface water runoff during construction and assist in its infiltration to subsurface flow systems minimising erosion and potential for overland flow into both watercourse channels.

9.11.19 Indirect impacts from accidental pollution incidents primarily in proximity to Whitelands Brook, in the east of the Site could lead to the alteration of water quality and degradation of Whitelands Brook. This could take place from accidental spills of large volumes of toxic chemicals that could overload the SuDS. In the absence of additional mitigation, it is predicted that indirect impacts from pollution incidents could give rise to adverse effects that would be significant at a local scale.

Bats

9.11.20 The structures in the north of the Site (Barn Complex and Farmhouse) are to be demolished as part of the Proposed Development design. Demolition of structures will result in the direct loss

of features that have been identified as supporting confirmed common pipistrelle and soprano pipistrelle day roosts. The roosts have been identified as supporting low numbers of individuals.

9.11.21 Additionally, ash trees located in the west of Area A are to be removed. This would include direct loss of two trees with features that have been recently confirmed as supporting noctule day roosts (in 2023) and a third tree with features that have been historically confirmed as supporting a noctule day roost (2019). No other confirmed roosts recent or historic are to be removed as part of the Proposed Development.

9.11.22 Suitable commuting and foraging habitat in the form of hedgerows will also be directly impacted as a result of construction. As a worst case, it is predicted that up to 2000 m of hedgerow is to be lost, which includes some hedgerows routinely used by relatively high numbers of common and soprano pipistrelle. Removal of these habitats would reduce the availability of commuting and foraging habitats available, including routes that may be used by bats for commuting to and from roosting sites in the wider landscape. This predicted hedgerow removal will include hedgerows lost permanently, and certain stretches that would be replaced.

9.11.23 The hedgerows extending to the east and north of North West Bullhouse Brook SINC will be removed, with the hedgerow extending to the north being removed to facilitate the creation of ditches for SuDS. The eastern hedgerow from North West of Bullhouse Brook will be removed to facilitate development. These hedgerows have been identified as areas with the highest level of bat activity during the course of bat activity surveys. Other species such as *Myotis* sp., noctule, and lesser horseshoe have been recorded in these areas, though in much lower numbers. Additionally, a series of interconnected hedgerows that run from south to north in the east-south east of Area A are to be lost permanently. The predicted loss of hedgerows could fragment key locations for common and pipistrelle bats and disrupt bat activity potentially leading to the decline in population numbers within the Site, which may not recover in the short-medium term. Though, it is assumed that hedgerow habitats across the Site would be removed pursuant to the phasing of the masterplan rather than all at once. This would leave several hedgerow features intact to enable continued commuting and foraging activity.

9.11.24 Activity surveys undertaken within Area B indicates that relatively similar numbers of common pipistrelle and soprano pipistrelle are using the woodlands, hedgerow and scrub habitats to the south of Area A. The findings suggests that suitable habitat is available and in the wider landscape to support displacement of the bat population within the Site.

9.11.25 Indirect impacts from noise, vibration and obtrusive lighting in proximity to existing tree roosts could lead to the disturbance and displacement of roosting, commuting and foraging bats within and just outside of Area A. Bats roosting within existing trees (Tree 22 and Tree 25), confirmed through recent and historic surveys could abandon these roosts as a result of elevated levels of noise from machinery. Similarly, commuting and foraging bats could be deterred from using existing, retained habitats as a result of these areas being illuminated as part of construction lighting.

9.11.26 The predicted length of hedgerows that will be lost to the Proposed Development will be replaced is referred to in sections above, with many hedgerows being reinstated in proximity to their original locations. This includes the hedgerows extending north and east from North West Bullhouse Brook and the hedgerow along the western boundary of Area A. Whilst minor severances in the hedgerow in the north of the Site are anticipated, it will largely be safeguarded from removal and will form part of a double hedgerow as part of a new proposed footway.

9.11.27 As outlined in 9.10, tertiary mitigation will include the provision for replacement roosts as part of the Proposed Development. Of relevance to the construction phase, bat boxes will be deployed prior the removal of roosting sites to ensure roosting opportunities are available following demolition. A minimum of 10 bat boxes will be deployed in suitable habitat in a suitable location and will function to increase the amount of opportunities available for roosting. Should there be a delay in the implementation of integrated roosting features (within new buildings) following demolition of the Barn Complex and Farmhouse buildings, the contingency plan for alternative roosting provision set out in 9.10 would be implemented. The contingency plan (which includes provision of alternative roosting provision mounted on trees) would be implemented if new buildings are not constructed early enough in the construction period.

Tertiary mitigation will also ensure vegetation clearance is undertaken in a sensitive manner, undertaken outside of peak activity periods for bats.

9.11.28 Considering embedded and tertiary mitigation measures but in the absence of additional mitigation, impacts on bats are predicted to be medium term, temporary and reversible giving rise to adverse effects that would be significant at a district scale.

Otter

9.11.29 Whilst it is anticipated that the construction phase would remove a proportion of the habitats within Area A, these are open habitats and largely unsuitable for otter, with much of the suitable habitats restricted to woodland and Whitelands Brook which will be protected from direct impacts. Suitable habitats for otter are largely present within Area B in the form of continuous woodland.

9.11.30 Whilst it is acknowledged that the woodlands provide suitable terrestrial habitat for otter, there is an abundance of better suited aquatic and associated terrestrial habitat within and along larger watercourses to the north of the Site (e.g. Kenson River and River Waycock). Otters have sizeable home ranges as identified in the Ecology of the European Otter (Chanin, 2003) covering 25 – 50 km of river channels. These areas are more likely to support resting places, than those within Area A.

9.11.31 Noise, vibration and to a lesser extent visual disturbance could disturb otter from using both terrestrial and aquatic habitat within the southern limits of Area A, extending to the northern limits of Area B. Disturbance effects could lead to otters abandoning any newly created resting places or natal dens within woodland habitats in proximity to Whitelands Brook. Though, it's likely that any otters in the area are acclimatised to increased noise levels as a result of farming operations, vehicular movements on Port Road and aircraft noise from the nearby Cardiff Airport. Additionally, the woodland in which Whitelands Brook is situated provides an element of existing screening. Lighting during construction could illuminate areas that are currently unlit, particularly in the east and along the south of Area A. Additionally, the habitat creation and enhancement measures as part of embedded mitigation would also be a factor in temporarily contributing to the potential disturbance of otter. Though habitat creation and enhancement proposals would be implemented in a very short time frame and during the day at a time when otters are largely inactive.

9.11.32 The approved SuDS will slow, capture and store surface water runoff during construction and assist in its infiltration to subsurface flow systems minimising erosion and potential for overland flow into both Whitelands Brook and Bullhouse Brook. Though, there is the potential for accidental pollution incidents to bring about a change in water quality within Whitelands Brook, particularly where the SuDS is unable to intercept large volumes of accidentally spilled chemicals.

9.11.33 In the absence of mitigation, impacts on otter are predicted to be temporary, reversible, and would give rise to an adverse effect, significant at a Site scale.

Dormouse

9.11.34 It is assumed that dormice are present within most of the hedgerows within Area A, particularly those considered to be species-rich, including all woodlands along its southern limits, and much of the wooded habitats in Area B, which are well connected to the wider landscape. Approximately 2000 m of hedgerow would be removed through Site and vegetation clearance to facilitate the Proposed Development. This estimated number includes entire stretches of hedgerow and smaller severances within existing, retained hedgerows.

9.11.35 Direct impacts on dormouse which includes the proposed hedgerow removal would lead to the loss of suitable habitat for dormouse including habitat fragmentation of areas within Area A used for commuting across the landscape. Though, it is assumed that some areas of habitat would remain intact rather than lost all at once. Site and vegetation clearance could also lead to the incidental killing or injury of dormouse individuals, and damage or destruction to nesting sites.

9.11.36 Noise, vibration and visual disturbance through lighting and increased human presence could give rise to disturbance of dormouse individuals using existing hedgerows and could deter individuals from using these habitats to commute and forage. Though, dormice are likely to be partially acclimatised to noise disturbance as a result of farming operations, vehicular movements on Port Road and aircraft noise from the nearby Cardiff Airport.

9.11.37 All hedgerows to be lost as a result of Site and vegetation clearance would be replaced within Area A as a result of embedded mitigation measures. Whilst some hedgerow stretches (such as those in the east) will be permanently lost, several will be reinstated in proximity to their original locations, allowing existing dispersal routes to be replaced. In addition to newly created hedgerows, scrub planting to include hazel-dominated parcels and mixed-species scrub will be implemented as part of the Proposed Development's landscape and habitat creation scheme, leading to a net increase in wooded vegetation.

9.11.38 Dormouse populations would be temporarily displaced into suitable habitat whilst the newly created hedgerows reach maturity. There is plenty of habitat suitable for displaced dormouse individuals, such as the woodlands along the southern limits of Area A, other woodlands and hedgerows within Area B and connected habitat outside of the Site. Given that dormice are known to live in low densities, it is likely that relatively low numbers of dormice are present within the hedgerow habitats within Area A. It is also likely that the population of dormice using hedgerow habitats within Area A would also commute and forage within woodland and hedgerows in Area B. As per the dormouse conservation handbook, second edition (Bright, P., Morris, P. and Mitchell-Jones, 2006) 50 dormice per nine ha of woodland is considered to be well within the carrying capacity of woodland habitats. Given the extent of woodland habitats within Area B (more than nine ha) and the extent of connected habitat beyond the Site, it is unlikely that the low numbers of displaced dormice would lead to significant impacts on the carrying capacity of habitats in the wider landscape. Further, tertiary mitigation would provide additional nesting opportunities through the provision of dormouse boxes within the southern limits of Area A and into Area B. Nest boxes have been stated to increase the carrying capacity of dormice within habitats (sometimes doubling the population density) (Bright, P., Morris, P. and Mitchell-Jones, 2006). Tertiary mitigation would also ensure a sensitive approach is taken to construction, including timing vegetation clearance outside of peak breeding periods for dormouse or during the hibernation period, to reduce impacts to breeding success.

9.11.39 Taking embedded and tertiary mitigation into account and in the absence of additional mitigation, impacts on dormouse could give rise to adverse effects that would be significant at between a local and district scale.

Priority Mammals

9.11.40 It is estimated that 14 hectares (ha) of improved grassland and just over 19 ha of agricultural farmland will be removed to facilitate the Proposed Development during the construction phase. Though not all of the habitat lost is considered to be optimal habitat for priority mammals, with some grassland and arable farmland parcels considered to be less suitable to priority mammals than others. These areas include grasslands in the centre and in the south of Area A. Whilst arable farmlands provide a foraging resource for species such as brown hare, most of the cereal croplands provide limited suitability for resting places and shelter. The non-cereal, wildflower croplands in the north west, south and east of Area A and taller grasslands in the south east will be removed which provide most of the opportunities available to priority mammals. In addition to habitat loss and fragmentation, it is likely that low numbers of priority mammals would be disturbed during construction as a result of noise, vibration and visual disturbance from light pollution and human presence, though priority mammals are likely to be partially acclimatised to noise levels as a result of farming operations, vehicular traffic at Port Road and aircraft noise at the nearby Cardiff Airport. Human presence as part of the creation and enhancement of areas in the south of Area A could also cause disturbance, though given the very short timeframe that this would take place it is unlikely to significantly affect priority mammals.

9.11.41 Site and vegetation clearance could also lead to the killing, injury and entrapment of priority mammals particularly harvest mouse that may be nesting within cereal croplands, and hedgehogs.

9.11.42 The phasing of the Proposed Development will ensure some habitat remains intact during construction rather than the complete loss of these habitats all at once. The proposed embedded mitigation measures including the retention and enhancement of a green space in the centre of Area A, replacement of all lost hedgerows, creation of hazel scrub, mixed-species scrub and creation of rough grassland in the south of Area A would offer new opportunities for priority mammals once established. This would include opportunities for foraging, suitable locations for the creation of brown hare forms and interfaces for harvest mouse to build nests, primarily in the south of Area A. The proposals for the mosaic of habitats in the south of Area A including the added benefits of the SuDS will provide better quality habitat, new areas of shelter and would expand the connectivity between woodlands in the west and woodlands in the east.

9.11.43 Considering embedded mitigation and in the absence of secondary mitigation, direct and indirect impacts on priority mammals is predicted to give rise to significant adverse effects at a local scale.

Breeding Birds

9.11.44 Site and vegetation clearance would result in the removal of a proportion of the habitats within Area A. This includes up to 2000 m of hedgerow habitats (some of which support confirmed breeding birds) and more than 10 ha of arable farmland suitable for ground nesting birds, primarily skylark. No other suitable habitats would be directly impacted by the Proposed Development. Additionally, existing and retained hedgerows and woodland habitats would be subject to disturbance through noise and vibration, dust emissions and visual disturbance from human presence which could deter breeding species from selecting nest sites within these areas. Removal and disturbance of habitats would reduce the availability of breeding and foraging habitat used by a range of bird species including some species identified as notable. Habitat loss and disturbance could lead to the reduction in the population size of the breeding bird assemblage, with many species experiencing displacement into neighbouring habitat which may already be close to carrying capacity. Site and vegetation clearance could also impact the breeding bird assemblage through destruction of nests, leading the direct mortality of breeding species. A confirmed house sparrow nesting site would be lost, probable breeding territories of other notable species such as whitethroat, skylark, chaffinch, dunnock and song thrush would also be lost as a result of Site and vegetation clearance. Habitat loss during the construction phase could lead to the displacement of breeding species and the decline in the local population over a number of years if replacement habitat cannot be secured.

9.11.45 Whilst dust emissions could impact habitats within 50 m of the construction footprint used by breeding birds, limiting breeding potential, such effects are unlikely to materially affect breeding success. It is also likely that the breeding bird assemblage is partially acclimatised to noise disturbances given the farming operations, vehicular traffic on Port Road and aircraft noise from Cardiff airport.

9.11.46 With embedded mitigation measures that includes retention of certain hedgerows within Area A, replacement of all hedgerows lost and provision of hazel and mixed-species scrub, there would be a net increase in suitable nesting habitat for most species of breeding birds once established. The SuDS associated rough grassland and native wildflower planting that will form part of the new mosaic in the south of Area A will add new habitat types which would allow additional bird species to colonise the area. Though, the embedded mitigation measures would not replace all the suitable skylark habitat that would eventually be lost to the Proposed Development.

9.11.47 Notwithstanding the predicted net loss in skylark habitat, landtake would be cleared in phases as part of the Proposed Development, which would ensure suitable nesting habitats remain over the course of the construction phase whilst newly created habitats are becoming established. This would reduce the duration of impact on the breeding bird assemblage, which could be several breeding seasons if Area A was to be cleared at once.

9.11.48 Whilst construction of new buildings may take place within the breeding bird season (March to August inclusive), the timing of Site and vegetation clearance as set out in the tertiary mitigation measures in 9.10 (for bats and dormice), would largely avoid this period. This would reduce direct impacts on the breeding assemblage and avoid destruction of nest sites for most breeding

species. Though, house sparrow have been noted to breed all year round and nesting success could be hampered outside of the typical breeding season.

9.11.49 In the absence of additional mitigation measures, impacts on the breeding bird assemblage is predicted to give rise to significant adverse effects at a local scale.

Operational Phase

9.11.50 At present, information on the operational life of the Proposed Development is unknown, including the phasing of the masterplan. The detail of the phasing is to be developed as the detailed design of the Proposed Development progresses.

9.11.51 It is anticipated that development parcels would be operational at different times, the earliest is predicted to be 2027. Some development parcels will be operational while others will be in construction and pending future construction. It is assumed that there would be a cessation of agricultural operations within Area A following full operation of the Proposed Development.

Non-Statutory Designated Sites

9.11.52 The SuDS will ensure that surface water will be treated and controlled at source before discharging into the existing watercourses. As such, pollution incidents are likely to be controlled during operation.

9.11.53 On establishment of the embedded mitigation measures, new habitats are expected to expand connectivity between North West Bullhouse Brook SINC and North Bullhouse Brook SINC and the wider woodlands. This would diversify the structural integrity of the SINCs, reducing the 'groomed edge' and introducing new ecotones, ultimately increasing the resilience of SINCs and providing a beneficial impact.

9.11.54 No other impact pathways which could lead to significant effects on SINCs have been identified as a result of the operational phase. As such, impacts are predicted to be neutral and thus effects are predicted to be not significant.

Priority Habitats – Hedgerows

9.11.55 As above, the SuDS will ensure that surface water will be treated and controlled at source before discharging into the existing watercourses. As such, pollution incidents are likely to be controlled during operation.

9.11.56 No other impact pathways which could lead to significant effects on hedgerows have been identified as a result of the operational phase. As such, impacts are predicted to be neutral and thus effects are precited to be not significant.

Priority Habitats – Ancient Woodland / Semi-Natural Broadleaved Woodland

9.11.57 As above, the SuDS will ensure that surface water will be treated and controlled at source before discharging into the existing watercourses. As such, pollution incidents are likely to be controlled during operation.

9.11.58 On establishment of the embedded mitigation measures which include habitat creation and enhancement proposals and features associated with the SuDS would expand connectivity between ancient woodland and other semi-natural woodland in the southern part of Area A. This would diversify the structural integrity of the ancient woodland parcels, reducing the 'groomed edge' and introducing new ecotones, and outlets of connectivity, ultimately increasing the resilience of the woodlands and providing a beneficial impact.

9.11.59 No other impact pathways which could lead to significant effects on ancient woodland and semi-natural broadleaved woodland have been identified as a result of the operational phase. As such, impacts are predicted to be neutral and thus effects are predicted to be not significant.

Priority Habitats – Whitelands Brook and Bullhouse Brook

9.11.60 As above, the SuDS will ensure that surface water will be treated and controlled at source before discharging into the existing watercourses. With integrated oil interceptors and other control components of the SuDS, a change in water quality is not anticipated within Whitelands Brook and Bullhouse Brook.

9.11.61 No other impact pathways which could lead to significant effects on Whitelands Brook and Bullhouse Brook have been identified as a result of the operational phase. As such, impacts are predicted to be negligible and thus effects are predicted to be not significant.

Bats

9.11.62 No additional habitat loss beyond the habitats cleared during construction is anticipated. Creation of the spine road would introduce east-west vehicular traffic in an area that has not previously supported this activity. Whilst it is anticipated that the level of traffic would be minimal during the period when bats are active, there is an increased risk of vehicular collision, particular with the lager type vehicles (buses and Heavy Goods Vehicles) with the potential for the killing or injury of bats.

9.11.63 Artificial lighting associated with the operational phase such as new lighting on buildings, the spine road and proposed new footway could deter light sensitive species of bat from using existing and new habitats that are illuminated as a result of the development. Similarly, elevated levels of noise in proximity to existing and newly created habitats could disturb commuting and foraging bats, deterring them from commuting through Area A. Moreover, the operational footprint of the Proposed Development would fragment existing habitats and is likely to reduce the likelihood of bats using Area A. The creation and enhancement of habitats in the south of Area A at the outset of construction, including those features associated with the SuDS would replace and offer opportunities for commuting and foraging bats, on successful establishment leading to a beneficial impact. Given the phasing of the masterplan, it is highly likely that newly created habitats within the south of Area A would already be fully established prior to full operation of the Proposed Development.

9.11.64 In the absence of additional mitigation, operational impacts on bats are predicted to give rise to significant adverse effects at a local scale.

Otter

9.11.65 The operational footprint of the Proposed Development includes areas that do not support suitable habitat for otter, as a result, direct impacts are not anticipated to arise.

9.11.66 Artificial lighting on new buildings could illuminate wooded habitats such as woodland fringes, existing hedgerow habitats and areas in proximity to Whitelands Brook. Additionally, newly created suitable habitats could also be subjected to illumination. As such, new lighting could deter otter from moving through the Site, particularly along Whitelands Brook.

9.11.67 Equally, operational noise impacts could also lead to the disturbance of otter, deterring them from moving through the Site. Though, it is anticipated that noise levels during the period when otters are active (during night time hours) are likely to be lower than during inactive periods. It is also likely that otter individuals moving through the landscape are acclimatised to existing noise pollution from vehicular traffic on Port Road and aircraft noise from nearby Cardiff Airport.

9.11.68 Embedded mitigation measures would offer new areas of cover for otter along the southern limits of Area A, including additional areas for resting place creation and natal dens.

9.11.69 In the absence of additional mitigation, impacts of the Proposed Development could give rise to significant adverse effects at a Site scale.

Dormouse

9.11.70 No additional habitat loss is anticipated during the operational phase and thus direct impacts are not expected to arise.

9.11.71 Artificial lighting on new buildings could illuminate existing suitable habitat within Area A such as woodland edges, scrub and existing hedgerow habitats. Additionally, newly created suitable habitats could also be subjected to illumination. As a result, new lighting could discourage dormouse individuals from moving through the existing and the newly created hedgerow network, deterring them from using these habitats to commute and forage. Operational noise levels could also deter dormouse individuals from utilising existing habitats, though it is likely that dormice using Area A are acclimatised to elevated noise levels as a result of vehicular traffic on Port Road, aircraft noise from nearby Cardiff Airport and farming operations.

9.11.72 The operational footprint of the Proposed Development would fragment existing habitats and is likely to reduce the likelihood of Area A being used frequently by dormouse. The creation and enhancement of habitats in the south and west of Area A at the outset of construction, such as new hazel and mixed-species scrub would provide a beneficial impact offering new opportunities for nesting, commuting and foraging, on successful establishment. Given the phasing of the masterplan, it is highly likely that newly created habitats within the south of Area A would be established upon full operation of the Proposed Development. Management of these features would be in line with the method statement forming part of the EPS licence and will be carried out in a way which avoids direct impacts to these species.

9.11.73 With embedded mitigation but in the absence of additional mitigation, impacts on dormouse during operation is predicted to give rise to significant adverse effects at a local scale.

Priority Mammals

9.11.74 No additional habitat loss is anticipated during the operational phase. Increased risk of collision particularly in relation to hedgehog and the proposed spine road could arise, leading to the killing and injury of individuals. This would likely be a combined result of habitat fragmentation of retained habitats in the north of Area A from those in the south, and vehicular traffic. Though, given the nature of the Proposed Development and likelihood of reduced vehicular movements during the period that hedgehog is active, collision is likely to be greatly reduced. Whilst the risk of collision to other priority mammals cannot be ruled out, it is likely that this would be minimal and as such would not give rise to a significant adverse effect at any geographical scale.

9.11.75 Whilst embedded mitigation such as the proposals for the retained and enhanced green space within the centre of Area A would provide suitable habitats for priority mammals, it is unlikely to be routinely used by brown hare, harvest mouse and polecat due to the fragmentation from areas in the south of Area A and Area B. Additionally, artificial lighting illuminating existing habitats could further deter priority mammals from utilising these habitats within Area A. Other embedded mitigation measures such as the habitat creation and enhancement measures along the southern limits of Area A, would provide a beneficial impact once established. This beneficial impact would result in new areas for foraging, commuting, form/nest site creation and shelter.

9.11.76 In the absence of additional mitigation, operational impacts on priority mammals could give rise to significant adverse effects at a Site scale.

Breeding Birds

9.11.77 No operational activity is expected to lead to direct impacts on breeding birds and there is unlikely to be risks associated with nest destruction, killing or injury. Many breeding species will have already been displaced during the construction phase, with these species likely recolonising retained and enhanced hedgerow and green space areas, including reinstated and created hedgerow habitats. Whilst most of the recolonising species would be common and widespread species that are not considered notable, the creation and enhancement measures proposed for the southern limits of Area A could support notable breeding species. The embedded mitigation measures proposed for implementation within the southern limits of Area A is expected to have become established prior the Proposed Development being fully operational, which would provide an abundance of food sources (increased invertebrates and fruiting vascular plants).

9.11.78 Indirect impacts as a result of artificial lighting, noise pollution and human presence could lead to the disturbance of breeding birds within retained and replaced hedgerow habitats in Area A,

including established green space areas. These indirect impacts are unlikely to extend beyond the boundary of Area A.

9.11.79 In the absence of additional mitigation, a net loss in habitat available for skylark would remain and typical farmland birds such as linnet and yellowhammer may not recolonise newly created hedgerow habitats within Area A in the short-term. As a result, effects on the breeding bird assemblage would continue to be significant adverse at a local scale during operation.

9.12 Design, Mitigation and Enhancement

9.12.1 This section sets out the additional mitigation and enhancement measures which are likely to be required to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on IEFs as identified in section 9.11.

9.12.2 Mitigation measures (beyond those identified as embedded) are proposed for all significant effects on the IEFs identified. Generic secondary mitigation measures are also proposed that include environmental best practice methods and general principles that can be applied to the Proposed Development and are relevant to habitats and species, particularly those identified within Area A and the wider Site. The mechanism for securing these mitigation measures will be through appropriate planning conditions and a Section 106 agreement between the Applicant and the Vale of Glamorgan County Council.

9.12.3 The following are considered to be generic additional mitigation measures to be implemented alongside the Proposed Development:

- Commitment to a Construction Environmental Management Plan (CEMP) which would include details of the measures to be employed to minimise effects of air quality (dust), noise and vibration, traffic (e.g. restricted speed to reduce collision) and water quality and other environmental best practice such as sensitive storage of chemicals, stockpiles and other potentially polluting materials. Environmental best practice will be delivering pursuant to the necessary codes of practice. Details of species-specific mitigation measures as outlined in 9.12 onwards would also form part of the CEMP.
- A sensitive lighting plan during construction and operation to ensure all new light is directed away from all wooded habitats, retained hedgerows, and newly created habitats to maintain a dark corridor for mobile species of wildlife. The sensitive lighting strategy would be designed to satisfy the Institute of Lighting Professional and Bat Conservation Trust's Guidance Note 08/23 'Bats and Artificial Lighting at Night' (Institute of Lighting Professionals and Bat Conservation Trust, 2023). The sensitive lighting plan would be applicable to all receptors identified within this ES.
- All works are to take place during daylight hours. Lighting used for construction is to be switched-off when not in use and positioned so as not to spill on to adjacent land or retained vegetation, within Area A and woodland habitats within Area A and Area B (details of which would be included within a sensitive lighting strategy). Operational lighting would be sensitively designed as per the above.
- Dust management measures during preparation and maintenance of the Site during the construction phase. This will include daily inspections within Area A and within Area B, including monitoring of dust soiling and dust deposition. The CEMP must include measures to minimise dust generation from operating vehicles and machinery including minimisation and / or suppression of dust generation from demolition, fabrication earthworks. As per the Technical Note: The Protection of Ancient Woodlands (RPS, 2022), screening barriers may be used to further prevent impacts from dust emissions.
- Commitment to a Detailed Biodiversity Strategy to include the necessary habitat prescriptions, management, and monitoring which would include details of the measures to be employed to minimise impacts on sensitive ecological receptors, which would be aligned to the Outline Biodiversity Management Strategy.
- Commitment to Site and vegetation clearance outside of the breeding bird season and peak dormouse breeding period, as per tertiary mitigation measures. Employment of a full time

Ecological Clerk of Works (ECoW) during Site and vegetation clearance activities to prevent mortality and injury to a range of potentially present species such as dormice, priority mammals, breeding birds and other species. Timing would be from mid-September onwards.

- Commitment to comply with best practice guidelines on environmental protection, for example the Guidelines on Pollution Prevention (GPP) 6 (NRW, SEPA and DAERA, 2023) (CIRIA C741 – Environmental Good Practice on Site (4th Edition) (CIRIA, 2015a), CIRIA C532 – Control of Water Pollution from Construction Sites (CIRIA, 2001).
- Prior to construction, pre-construction surveys are to be carried out. This will confirm that conditions have not changed, and that no additional ecological receptors require consideration (e.g. badger setts, otter resting places and additional bat roosts). It is recommended that pre-construction survey visits are carried out in good time prior to the construction phase, to reassess the ZoI giving an accurate representation of the ecological receptors present at the time of works. The surveys are referred to in the specific species section below.
- Precautionary Methods of Working (PMoW) (such as phased and sensitive methods of vegetation clearance) are to be implemented, which will be included within a CEMP. The PMoW will focus on the necessary measures to prevent impacts on the identified IEFs, extending to reptiles, amphibians, badgers and where applicable terrestrial invertebrates and native vascular plants. This will include provision of Tool Box Talks to contractors prior to the start of works to emphasise key areas of biodiversity value and highlight key locations for particular receptors.
- Materials that could be used by sheltering animals will not be stored adjacent to potentially suitable habitat, to ensure certain receptors do not move into the construction site. Heras fencing or similar is to be used to cordon off these areas.
- An Invasive Species Management Plan will be implemented, and biosecurity measures put in place to control the spread of invasive non-native plant species, particularly Japanese knotweed in the north of Area A. These shall be designed by a specialist third party contractor.

Net Benefit for Biodiversity

9.12.4 The approach to delivering gains for biodiversity in Wales is to deliver an overall enhancement in biodiversity by maintaining ecosystem resilience and providing biodiversity enhancement. This approach puts the emphasis on a proactive, holistic consideration of biodiversity and wider ecosystem benefits within a placemaking context early in the design process (Welsh Government, 2024). In addition, Planning Policy Wales (2024) states that:

> *'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 well-being.'*

9.12.5 A net benefit for biodiversity is the concept that infrastructure development should leave biodiversity and the resilience of ecosystems in a significantly better state than before, through securing immediate and long-term, measurable and demonstrable benefit, on or adjacent to a development site. To encourage compliance with the latest edition of PPW and the approach to delivering a net benefit to biodiversity in Wales, multiple enhancement measures have been developed as part of the Proposed Development's outline design. These currently sit within an outline version of the Proposed Development's Biodiversity Strategy (RPS, 2019[c]), with proposals forming part of the embedded design and additional mitigation. The final version of this strategy will specify the details for implementation and the aftercare of the Site including long-term management of the extension to Porthkerry Country Park. It is expected that the detailed biodiversity strategy would be developed following further and continued consultation with the Vale of Glamorgan County Council.

9.12.6 As per the Section 6 Duty of the Environment (Wales) Act 2016 and PPW12, ecosystem resilience and resilient ecological networks are integral components for the delivery of a net

benefit for biodiversity. To this end, NRW have developed the DECCA Framework (Diversity, Extent, Condition, Connectivity and Adaptability/Aspects of ecosystem resilience). This framework is a recognition of interconnectivity between and within habitats within a given area and the wider vicinity. PPW (2024) states:

> *'Development plan strategies, policies, and development proposals must consider the need to... secure the maintenance and enhancement of ecosystem resilience and resilient ecological networks by improving diversity, extent, condition and connectivity.'*

9.12.7 The measures specified in this report aim to fulfil these requirements by ensuring retention, maintenance, and enhancement of areas within Area A as far as practicable, to enable connectivity with adjacent habitats and areas within Area B.

9.12.8 A Green Infrastructure Statement has been produced (RPS, 2024[c]) to support the appeal submission, which provides a summary of how the Proposed Development would retain, protect and connect existing and new habitats within Proposed Development footprint to enhance ecological networks. This includes information on how ecosystems could be maintained and enhanced, how nature-based solutions have been factored into the Proposed Development and ultimately how the step-wise Approach has been followed. This information is also illustrated in plan form within the Green Infrastructure Statement document.

Design

9.12.9 Whilst is assumed that embedded mitigation such as the landscaping proposals and ecological creation and enhancement measures are to be implemented at the outset of construction, the approach to timing of site and vegetation clearance has not been defined. As part of the phasing of the masterplan, it is proposed that certain elements of the embedded mitigation measures are implemented prior to the loss of key areas within Area A, as far as practicable possible. This would aim to reduce the duration of impact of habitat loss for certain IEFs, particularly commuting and foraging bats and to a lesser extent breeding birds.

9.12.10 The Proposed Development would result in the loss of approximately 250-300 m of hedgerow extending to the east of North West Bullhouse Brook SINC. This has been identified as a key commuting and foraging route for common pipistrelle and soprano pipistrelle, particularly within the summer period, with total cumulative number of bat passes (for both species) recorded to be over 60000. Additionally, as part of activity transect surveys, common pipistrelle and soprano pipistrelle bats have been identified commuting and foraging to the north of North West Bullhouse Brook SINC, with activity spikes observed along the hedgerow to the woodlands east, around a field gate.

9.12.11 As per JCD0064-006-J-210607 Parameter Plan – Green Infrastructure, several lost hedgerows will be reinstated in proximity to where they are proposed for removal. As part of the implementation of these habitats, it is proposed that selected features are created prior to the loss of the existing hedgerow. Where it is feasible within the masterplan to connect habitats that are proposed for retention with newly proposed habitats, this should be implemented. An example would be to connect the proposed 850 m hedgerow (to the south of the proposed footway), to hedgerows running south-north. This would reduce the duration of the predicted impact.

9.12.12 No other design features over and above those that are considered to be embedded are proposed.

Specific Mitigation and Enhancement Measures

9.12.13 A series of mitigation measures would be employed during construction and operation to further avoid, reduce and offset impacts resulting from the Proposed Development. The detail of these measures are not confirmed at the current stage, but it is anticipated that they will be developed in greater detail alongside the ongoing design of the Proposed Development following successful planning consent. Detailed information will be included in a final, Detailed Biodiversity Strategy with precautionary measures and environmental best practice for

construction set out within a CEMP. These documents would be secured by a planning condition.

9.12.14 The mitigation measures set out in this section are primarily associated with the extension to Porthkerry Country Park, though other elements such as design measures have been included. These measures are considered to be additional to those embedded as part of the habitat creation and enhancement measures proposed within Area A.

9.12.15 The agreement will secure all necessary mitigation and enhancement measures following successful planning consent. It is anticipated the management and maintenance of these measures will be secured for a period of 20 years.

9.12.16 Measures included for receptors that are not considered IEF are also set out in this section.

Non-Statutory Designated Sites and Ancient Woodland

9.12.17 As set out in the Outline Biodiversity Management Strategy (RPS, 2019[c]), targeted management of woodlands including woodland SINCs would be implemented as part of the Proposed Development. This would include low intervention management of Ancient Woodland parcels and their respective underpinning SINC designations, namely North West Bullhouse Brook SINC and North Bullhouse Brook SINC. See Table 9 for indicative areas and lengths for the management and enhancement of existing habitats.

9.12.18 Additionally, newly proposed scrub and new woodland planting to the west and east of both North West Bullhouse Brook SINC and North Bullhouse Brook SINC will enhance structural diversity of the existing woodland habitats, offer protection to the fringe trees and increase the SINCs resilience to environmental pressures.

9.12.19 Additional measures to include precautionary working methods to prevent dust emissions, sensitive storage of materials including measures to avoid accidental pollution incidents will be secured as part of a CEMP. Oil and chemical spills and spill kits will be widely available in the unlikely event of a spillage. There will be no storage of potentially contaminating materials in areas of ecological / hydrological sensitivity. A Pollution Incident Response Plan will be included as part of the CEMP to ensure that impacts from any accidental spills (should they occur) are intercepted immediately.

Habitats

9.12.20 It is estimated that up to 34 ha of arable and grassland habitats and just over 2000 m of hedgerow would be lost to the Proposed Development. This is considered to be a worst-case scenario for the Proposed Development (which includes just over 500m lost as a result of the Rapid Transport Corridor).

9.12.21 Areas have therefore been proposed for the provision of new and enhanced habitats beyond those included as part of the Proposed Development's embedded mitigation measures. The provision of these habitats will form part of the proposed extension to Porthkerry Country Park, referred to as Area B.

9.12.22 Outline measures have been proposed within Area B. Areas have been identified for the creation of new habitats and enhancement of existing habitats, to allow better quality and higher value features as part of a medium-scale green infrastructure scheme. The proposed measures have been identified to further reduce significant effects, and with embedded mitigation to enable the delivery of a net benefit for biodiversity.

9.12.23 The proposed provisions for habitat creation and enhancement proposals within Area B are provided in the Outline Biodiversity Management Strategy (RPS, 2019[c]) and illustrated on plans referred to in paragraph 9.10.2 of this ES.

9.12.24 These plans have been combined to illustrate the overall landscape and biodiversity proposals for the Proposed Development at the current stage. The proposals can be seen on Figure 1 - Biodiversity and Green Infrastructure, located within the Green Infrastructure Statement (RPS, 2024[c]).

9.12.25 A detailed Biodiversity Strategy would be brought forward at detailed design stage in accordance with the outline Biodiversity Management Strategy, which would be secured by a planning condition. Outline proposals for habitat creation and enhancement have been designed with regard to the impacts on Priority Habitats, primarily hedgerows. Replacement tree planting, grassland, scrub and woodland and wetland habitat creation has also been proposed. New areas of non-cereal arable farmland is also proposed.

9.12.26 All new landscape and habitat creation would be subject to a long-term management and maintenance plan. The management plan would prescribe the maintenance regimes for all different landscape / habitats considering the aims, objectives and functions of each area of planting / habitat. The management plan would also set out proposals for monitoring and the desired target condition of created areas to assess how these develop post-implementation.

9.12.27 Table 9.8 below sets out the indicative areas and lengths of habitats to be created as part of the Proposed Development. These habitats are illustrated on Figure 1: Biodiversity Plan of the Green Infrastructure Statement, with outline measures outlined in Table 1 of the Outline Biodiversity Management Strategy (RPS, 2019[c]).

Table 9.8: Indicative Areas and Lengths of Habitat Creation within Area B

Habtiat Type	Area to be Created (ha)	Length Created (m)
Mixed species scrub	1.0	-
New woodland	2.28	
Grassland managed for skylark	6.86	-
Marshy grassland	0.74	
Mixed sacrificial arable crop sown with netar and pollen	1.68	-
Species-rich Hedgerows	-	869.67
Total	**12.56**	**869.67**

9.12.28 Table 9.9 below sets out existing habitat areas and lengths to be managed and enhanced as part of the Proposed Development's efforts to elevate habitat condition, maintain and enhance ecological networks and ensure ecosystem resilience, The management would be implemented Site wide. Management measures are summarised in the Outline Biodiversity Management Strategy. Detailed management and maintenance measures would form part of a Detailed Biodiversity Strategy.

Table 9.9: Indicative Areas and Lengths of Existing Habitats to be Managed and Enhanced

Habtiat Type	Area to be Managed/ Enhanced	Length to be Enhanced
Ancient woodland management	6.95	
Semi-natural broadleaved woodland and tree belt management	4.44	
Scrub management	0.35	
Enhanced hedgerows/infill planting	-	292.44
Total	**11.74**	**292.44**

9.12.29 The above areas would deliver more than 22 ha of habitat creation and enhancement in addition to more than nine ha proposed within Area A (as per embedded mitigation measures). At present the detailed information of open space / green infrastructure areas within Area A is not available. These areas would be designed as the Proposed Development design progresses and would include the necessary habitat types and features that benefit both biodiversity and the objectives of Porthkerry Country Park. As part of this ES, it is proposed that these areas would include grassland habitats that include elements of wildflower meadow species. This proposal is based on indicative measures included within Table 4 of the 210422 JCD0064 Cover Letter. Table 4 of the Cover Letter sets out the proposed seed mix for the sides of the SuDS basins which are adjacent to the propose open spaces. The open spaces should be seeded with the same seed mix but this detail would be confirmed at a later stage.

9.12.30 A further 16 ha of land within would be available for further creation and enhancement within Area B. This land is referred to as 'Porthkerry Country Park Extension' on the Parameter Plan. Whilst no habitat creation or enhancement measures have been proposed within these areas, it is assumed that measures could be developed following successful consent of the Proposed Development, and as part of a Detailed Biodiversity Strategy in conjunction with the Vale of Glamorgan County Council. The 16 ha would be in addition to the proposed 31 ha of creation and enhancement measures.

9.12.31 It is proposed that necessary habitat creation and enhancement measures outlined above would be implemented within Area B at the outset of construction of the Proposed Development. This would enable a reduction in the impact duration of habitat loss on protected and notable species.

9.12.32 The measures set out in the tables above would provide benefits for those receptors considered to be of importance at a Site scale and would encourage colonisation of the proposed areas by species of reptiles, amphibians and terrestrial invertebrates.

Bats

9.12.33 Hedgerow removal as part of the Proposed Development will remove key commuting and foraging areas for roosting bats within the Site, primarily for common and soprano pipistrelle which have been the most frequent species recorded within the Site during surveys and assessments since 2019. This includes the hedgerows to the east and north of North of Bullhouse Brook SINC, and a group of hedgerows in the east of Area A. These hedgerows have been identified as linear habitats frequently used for commuting and foraging by common and soprano pipistrelle, along with a number of other bat species such as *Myotis* sp.

9.12.34 A further 869 m of new hedgerows are proposed within Area B (in addition to the proposed 2324 m proposed within Area A) which will provide a net increase of hedgerow habitats within the Site and will connect new linear corridors from within the Site to the wider landscape. New hedgerows will provide commuting and foraging bats with additional opportunities to navigate the Site and wider landscape. New mixed-species scrub is proposed along the southern perimeter of Area A and northern perimeter of Area B, and along the western edge of North of Bullhouse Brook SINC which would provide new ecotones, bolster existing commuting routes and provide new areas to forage. In addition to the proposed mixed-species scrub, more than 2 ha of woodland is proposed along the northern perimeter of Area B, reducing the current 'groomed edge' of woodlands forming part of North West Bullhouse Brook SINC and North of Bullhouse Brook SINC offering new interfaces for commuting and foraging. In the long-term, woodlands are likely to offer additional roosting provision based on newly created features created by other species, such as woodpeckers.

9.12.35 Additionally, the creation of marshy grassland/wetland habitat in the north of Area B will provide additional habitat for foraging bats. On successful establishment of the marshy grassland, invertebrate density is likely to increase providing additional prey items for foraging bats. Similarly, the areas proposed for management and enhancement of grassland (such as those for skylark) will likely supplement the foraging resource provided by the newly proposed wooded habitats.

Dormouse

9.12.36 The current proposals for habitat creation and enhancement within Area B includes more than 3 ha of both new woodland and mixed species-scrub and more than 800 m of new hedgerows, which would provide a net increase in the suitable wooded habitat available for dormouse. This would offer new areas for the provision of natural nesting sites for both breeding and hibernation and would increase connectivity within the Site and to woodlands outside of the Site.

9.12.37 Proposed woodland management would enhance the structure of the existing woodlands, providing a greater level of structural diversity and allow for the development of new natural nesting sites. More than 300 m of defunct hedgerows will be infilled, supplementing the newly created hedgerow habitats and offering a wider range of dispersal.

9.12.38 Dormouse boxes referred to in the tertiary mitigation section should be specifically procured to ensure the boxes can only be used by dormouse populations and not breeding birds. The type of box would include slot boxes and other boxes with modified entrances to prevent uptake by common and widespread breeding birds.

Badger

9.12.39 In addition to the newly proposed hedgerows, woodland and grassland habitats which would increase the area available for the creation of setts, the following generic mitigation measures are to be implemented:

- A pre-construction badger survey would be carried out at least three months in advance of site and vegetation clearance to ensure any new information is obtained;
- A further survey would be completed within one week prior to site and vegetation clearance commencing. This would allow identification of any additional mitigation required, in the unlikely event new setts are established within Area A.

9.12.40 If newly established setts are created within Area A prior to site clearance and construction, an appropriate course of action would be taken based on the nature, status and size of the sett and proximity to Proposed Development areas. If a newly created sett cannot be avoided, entrances will need to be closed and an artificial sett would be required within the vicinity.

9.12.41 As part of the pre-construction surveys for badger, a feasibility study would be undertaken to ascertain the suitability of the newly proposed habitats for the creation of an artificial badger sett.

Otter

9.12.42 New woodlands, mixed-species scrub and enhanced connectivity between woodland in the east and woodlands in the west would offer new areas in addition to those that will remain within Area A for the provision of resting places and the creation of natal dens.

9.12.43 The following generic mitigation measures would be implemented for otter:

- A pre-construction otter survey would be carried out along the entire stretch of Whitelands Brook, any new watercourses of aquatic features suitable for otter and the surrounding woodlands at least three months in advance of site and vegetation clearance. This would be to ensure any new information is obtained.
- In the unlikely event that any newly obtained information changes the status of otter within the Site, particularly within Area A, such as confirmed resting places, locations of established pathways for otter then additional measures would be required.
- These measures would include avoidance of obstructions to established otter paths and access to any new suitable aquatic habitat.
- Setting up a minimum 30 m exclusion zone from any new resting places with an extension of this exclusion zone to 100 m of natal dens or confirmed breeding sites.
- If breeding was confirmed within woodlands and exclusion zones of the size set out above were not possible, works would be undertaken in accordance with an EPS licence to derogate the legislation protecting otter (except during periods of active breeding). As part of the licence, appropriate compensation would be provided to ensure that alternative habitat is provided in advance of the impact occurring.

9.12.44 Pollution prevention guidelines (as referred to above) documented in a CEMP would prevent pollution events discharging into Whitelands Brook and Bullhouse Brook.

Priority Mammals

9.12.45 A walkover as part of pre-construction checks for badger and otter will also include a targeted search for priority mammals. This search would be search for nesting sites, forms, hibernacula and dens that may be impacted during construction.

9.12.46 New woodland, scrub, grassland and enhanced croplands are proposed within Area B which would offer new and better quality areas of cover and resting place provision. The proposals will also offer new foraging in the form of fruiting vascular plants of grassland and arable farmland.

9.12.47 The implementation of new and enhancement of existing hedgerows within Area B would offer additional habitat linkages between woodlands, grasslands and existing arable farmland which would provide multi-functioning benefits such as areas of cover and forage.

Breeding Birds

9.12.48 As outlined in the tertiary mitigation section and the general measures section above, site and vegetation clearance is to be timed for the period outside of the breeding bird season (March to August inclusive) which would coincide with the period outside of peak dormouse breeding and would be a requirement as part of an EPS licence for dormouse.

9.12.49 If there is a justifiable reason for clearance to be undertaken within this period, the vegetation would be subject to a pre-clearance check by an ECoW. In the event that active nests are discovered, clearance works would be halted within a minimum distance of 5 m from the nest. This buffer distance would be varied on the advice of the ECoW, dependent on the nature of affected habitats and the species of bird involved. Clearance works would not commence until nestlings had fledged, with a re-inspection by an ecologist to confirm the absence of active nests.

9.12.50 A wealth of additional suitable habitats is proposed in the southern limits of Area A and within Area B. All proposed woodland, scrub, grassland and croplands will provide new nesting sites for a range of both common and widespread breeding birds and those that are considered to be notable, such as the farmland bird community (skylark, linnet and yellowhammer). More than 8 ha of grassland and sacrificial cropland will be provided, this will provide benefits for ground nesting birds with 6 ha specifically managed for skylark in the centre of Area B and its southern limits.

9.12.51 As per recommendations within the first iteration of the PEA (RPS, 2018), a Schwegler 1SP sparrow terrace is to be included on the first new building developed within Area A. Should there be a time-lapse between demolition and construction of the first building, the sparrow terrace would be deployed on a post in suitably safeguarded habitat. Upon construction completion of the first building, an additional Schwegler 1SP sparrow terrace would be deployed on an appropriate façade of the building.

Invasive Non-Native Species

9.12.52 A pre-construction ecological walkover survey would be completed in the active growing season (approximately April to August inclusive) prior to vegetation and site clearance commencing in any part of Area A. This would inform additional measures to be included within an invasive non-native species management strategy to control the spread of species such as Japanese knotweed. The precautionary measures would also be included within a CEMP.

9.13 Residual Effects

9.13.1 This section sets out the predicted residual effects on IEF following the identification of secondary / additional mitigation. A summary of all effects are included within Table 9.10.

Non-Statutory Designated Sites

9.13.2 Following implementation of the mitigation measures set out in 9.12, no residual effects are predicted on SINCs during construction.

9.13.3 Upon successful establishment of the habitat creation and enhancement measures proposed either side of North Bullhouse Brook and North West Bullhouse Brook, impacts are likely to give rise to a beneficial impact that would be significant at a local scale during operation.

Priority Habitats – Hedgerows

9.13.4 Following implementation of the mitigation measures set out in 9.12, impacts on hedgerows during construction are likely to be mitigated and reduced, with significant adverse effects remaining, though this would reduce to a Site scale only (given that losses will be phased within Area A) in the short to medium-term until new hedgerows become established, at which point no residual effects would remain.

9.13.5 On successful establishment of the replaced hedgerows within Area A and the additional hedgerows within Area B, hedgerow habitats will experience a net increase during the operational phase. As such, residual effects are likely to be significant beneficial at a local scale.

9.13.6 It should be noted that adverse effects on hedgerows would be further reduced should the Rapid Transport Corridor not come forward. Just over 500m of hedgerow would be retained as a result.

Priority Habitats – Ancient Woodland / Semi-Natural Broadleaved Woodland

9.13.7 Following implementation of the mitigation measures set out in 9.12, residual effects are not anticipated to occur on ancient woodland and semi-natural broadleaved woodland.

9.13.8 On successful establishment of the proposed scrub planting and new woodland within Area B, the operational phase is likely to lead to a significant beneficial effect at a district scale.

Priority Habitats – Whitelands Brook and Bullhouse Brook

9.13.9 Following implementation of the mitigation measures set out in 9.12, no residual effects on Whitelands Brook and Bullhouse Brook are anticipated during construction.

9.13.10 With the cessation of agricultural runoff into Whitelands Brook during, reduced trampling by domesticated animals and establishment of the habitat management measures during operation, impacts on the watercourses are likely be beneficial, with effects significant at a Site scale, increasing to an effect significant at a local scale in the medium-term.

Bats

9.13.11 With the implementation of embedded mitigation measures alongside tertiary and additional mitigation measures, particularly a sensitive lighting plan and timing of the creation of habitat features, residual effects are predicted to remain adverse during construction, though these effects would be reduced and would be significant at a Site scale, decreasing to no residual effects in the short-medium term until planting proposals become established.

9.13.12 With the implementation of a sensitive lighting plan during operation, and habitat creation and enhancement measures, including a sensitive approach to traffic/vehicular speeds it is likely that no significant residual effects would remain during operation. Upon establishment of habitat creation and enhancement measures maturation of woodland habitats, it is likely that effects would be significant beneficial up to local scale in the short-medium term.

Otter

9.13.13 With the implementation of mitigation measures set out in 9.12, it is predicted that there would be no significant residual effect on otters during construction.

9.13.14 With the cessation of agricultural runoff into Whitelands Brook, and the reduction in trampling it is assumed that Whitelands Brook could reach better conditions during operation. Additionally, with the establishment of additional mitigation measures, it is predicted that effects would be beneficial and significant at a local scale for otter. With the maturation of the woodland habitats, effect significance could increase to be positive at a local scale in the medium-long term.

Dormouse

9.13.15 With the implementation of embedded and tertiary mitigation measures, and the secondary mitigation measures as set out in 9.12, alongside the phasing of losses during construction, residual effects are predicted to be neutral and not significant.

9.13.16 Upon establishment of scrub and new woodland habitats within Area B, and the maturation of all replaced habitats within Area A, it is predicted that there would be a significant beneficial effect on dormouse at the local scale during the operational phase of the Proposed Development, increasing to district scale significance in the medium-term.

Priority Mammals

9.13.17 With the implementation of the additional mitigation measures as set out in 9.12 such as precautionary measures, environmental best practice and timing of work, no residual effects are expected to occur during construction.

9.13.18 Upon establishment of new woodland habitats, scrub, rough grassland and new arable planting within Area B, and the maturation of the dark corridor between North West Bullhouse Brook SINC and the north of the Site within Area A, it is predicted that there would be a significant beneficial effect on priority mammals at the Site scale during the operational phase of the Proposed Development.

Breeding Birds

9.13.19 With the implementation of the mitigation measures as set out in 9.12, including precautionary measures, timing of clearance and creation and enhancement of habitats within Area B, adverse effects are expected to remain during construction, though this would reduce to a Site level, with no residual effects anticipated upon maturation of the habitat creation proposals in the short-medium-term.

9.13.20 With the mitigation measures set out in 9.12 and upon establishment of habitat creation and enhancement measures including new scrub, more than eight ha of grassland habitat, new wetland and hedgerows within Area B, it is predicted that there would be a beneficial effect on breeding birds, significant at a local scale.

9.14 Monitoring

9.14.1 As the Proposed Development is at outline stage, a monitoring scheme to test the success of the mitigation measures has not been developed. As per Section 4 of the Outline Biodiversity Management Strategy, monitoring will be secured within a Detailed Biodiversity Strategy, the details of which would be developed as the design the Proposed Development progresses. Broadly speaking, surveys, walkovers and checks would be undertaken for all mitigation measures (where applicable) during the years following the outset of construction and during operation.

9.14.2 The monitoring will highlight positive and negative outcomes for nature conservation, habitats and species. If the mitigation measures are failing to achieve their desired effect, proposals for how this can be corrected would be identified by a suitably qualified ecologist. This will inform how management prescriptions need to be changed. The review will also highlight actions that no longer have continued relevance which should be omitted in future years.

9.15 Major Accidents and Disasters

9.15.1 Major accidents and disasters such as major pollution events, extreme flooding, explosion/extreme fire outbreak, and major collapse of structures could lead to significant adverse effects on all ecological receptors identified. The reasonable worst consequence if events did occur would include degradation and long-lasting damage to habitats within the Site and immediate vicinity that may prevent full recovery beyond the capacity of minor restoration efforts.

9.15.2 Embedded and additional mitigation principally those required through regulatory frameworks would be required to significantly reduce the scale of impact on ecological receptors should such events arise.

Table 9.10: Summary of Impacts and Effects

Important Ecological Feature	Importance	Impact Sources	Nature of Effects	Summary of Mitigation/Enhancement	Significance of Residual Effect
Construction Phase					
Non-Statutory Designated Sites	County	Pollution incidents	Alteration and degradation of habtiat conditions	Protection buffers CEMP PMoW and ECoW Control of dust emissions SuDS Pollution response measures Expansion of wooded habtiats and management of SINC woodlands	None/not-significant
Priority Habtiats - Ancient Woodland and semi-natural broadleaved woodland	County	Pollution incidents Permanent landtake	Alteration and degradation of habtiat conditions	Protection buffers CEMP PMoW and ECoW Control of dust emissions SuDS Pollution response measures Expansion of wooded habtiats and management of SINC woodlands	None/not-significant
Priority Habitats - Hedgerows	District	Pollution Permanent landtake	Alteration and degradation of habtiat conditions Loss of habitat	Protection buffers CEMP PMoW and ECoW Control of dust emissions SuDS Pollution response measures Replacement and enhancement of existing hedgerows	Significant adverse at a Site scale, decreasing to no residual effects in short-medium term
Priority Habitats - Watercourses	Local	Pollution incidents	Alteration and degradation of habtiat conditions	Protection buffers CEMP PMoW and ECoW SuDS Pollution response measures	None/not-significant
Bats	County	Landtake Noise and vibration Pollution incidents	Disturbance and displacement Direct injury/mortality	Protection buffers CEMP and environmental best practice (noise and vibration)	Significant adverse at Site scale, decreasing to no

Important Ecological Feature	Importance	Impact Sources	Nature of Effects	Summary of Mitigation/Enhancement	Significance of Residual Effect
			Loss of roosting, commuting and foraging habtiat	PMoW and EPS licence method statement Control of dust emissions SuDS Pollution response measures Sensitive lighting strategy Replacement and enhancement of existing hedgerows Sensitive vegetation clearance Timing of replacement habtiats Woodland and scrub expansion Dark corridors Bat boxes	residual effect in short-medium term
Otter	County	Noise and vibration Pollution incidents	Disturbance	Protection buffers CEMP and environmental best practice (noise and vibration) PMoW Control of dust emissions SuDS Pollution response measures Sensitive lighting strategy Woodland and scrub expansion Wetland creation Dark corrdiors	None/not-significant
Dormouse	County	Landtake Noise and vibration Lighting Pollution incidents	Disturbance and displacement Direct injury/mortality Loss of nesting, commuting and foraging habtiat	Protection buffers to suitable habitats CEMP and environmental best practice (noise and vibration) PMoW and EPS licence method statement Control of dust emissions SuDS Pollution response measures Replacement and enhancement of existing hedgerows Sensitive vegetation clearance Timing of replacement habtiats Woodland and scrub expansion Dormouse boxes	None/not-significant

Important Ecological Feature	Importance	Impact Sources	Nature of Effects	Summary of Mitigation/Enhancement	Significance of Residual Effect
				Dark corridors	
Priority Mammals	Local	Landtake Noise and vibration Lighting Pollution incidents	Disturbance and displacement Direct injury/mortality	Protection buffers to wooded habitats CEMP and environmental best practice (noise and vibration) PMoW and ECoW Control of dust emissions SuDS Pollution response measures Sensitive lighting strategy Sensitive vegetation clearance Woodland and scrub expansion Grassland creation Replacement of hedgerows	None/nont-significant
Breeding Birds	Local-district	Landtake Lighting Noise and vibration Pollution incidents	Disturbance and displacement Direct injury/mortality / destruction of nests Loss of breeding territories	Protection buffers to wooded habitats and retained hedgerows CEMP and environmental best practice (noise and vibration) PMoW and ECoW Control of dust emissions SuDS Pollution response measures Sensitive lighting strategy Sensitive vegetation clearance Woodland and scrub expansion Grassland creation Replacement of hedgerows	Significant adverse at Site scale, decreasing to no residual effects in short-medium term
Operational Phase					
Non-statutory designated sites	County	Habitat management and enhancement	Enhanced condition and reilience to environmental pressures	Habitat monitoring and maintenance	Significant beneficial at local scale
Priority Habtiats - Ancient Woodland and semi-natural broadleaved woodland	County	Habitat management and enhancement	Enhanced condition and reilience to environmental pressures	Habitat monitoring and maintenance	Significant beneficial at a district scale
Priority Habitats - Hedgerows	District	Habitat management and enhancement and creaetion	Net increase in hedgerow habitats Enhanced conditions	Habitat monitoring and maintenance	Significant beneficial at Site to local scale

Important Ecological Feature	Importance	Impact Sources	Nature of Effects	Summary of Mitigation/Enhancement	Significance of Residual Effect
Priority Habitats - Watercourses	Local	Habitat management and enhancement	Enhanced condition and reilience to environmental pressures	Habitat monitoring and maintenance	Significant beneficial at a Site scale, increasing to local scale in medium-term.
Bats	County	**Negative** Operational lighting Vehicular collision Habtiat Fragmentation **Positive** Habitat management and enhancement	**Adverse** Disturbance Direct inury/mortality **Beneficial** Reinstatement and increase in availability of suitable habitats	Sensitive lighting strategy Sensitive traffic/speed measures (along spine road)	No residual effects, increasing to significant beneficial at local scale in the short-medium term
Otter	County	**Negative** Oeprational lighting **Positive** Habitat management and enhancement	**Adverse** Disturbance **Beneficial**	Sensitive lighting strategy Habitat monitoring and maintenance	Significant beneficial at local scale
Dormouse	County	**Negative** Oeprational lighting **Positive** Habitat management and enhancement	**Adverse** Disturbance **Beneficial** Reinstatement and increase in availability of suitable habitats	Sensitive lighting strategy Habitat monitoring and maintenance	Significant beneficial at local scale, increasing to district scale significance in the medium term.
Priority Mammals	Local	**Negative** Oeprational lighting Vehicular collision **Positive** Habitat management and enhancement	**Adverse** Disturbance Direct injury/mortality **Beneficial** Reinstatement and increase in availability of suitable habitats	Sensitive lighting strategy Sensitive traffic/speed measures (along spine road) Habitat monitoring and maintenance	Significant beneficial at Site scale
Breeding Birds	Local-district	**Negative** Oeprational lighting **Positive** Habitat management and enhancement	Adverse Disturbance **Beneficial** Reinstatement and increase in availability of suitable habitats	Sensitive lighting strategy Habitat monitoring and maintenance	Significant beneficial at a local scale

9.16 Cumulative Effects

9.16.1 Cumulative effects arising from the combined impacts of proposed plans or projects in proximity to the Site are set out in the table below. Where limited information on a particular plan or project prevents the assessment of cumulative effects, this is stated.

Table 9.11: Assessment of Cumulative Effects

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
Candidate Site 361	Land at Port Road, Rhoose	This is currently a candidate site. It is an existing allocation that is unimplemented but likely to be rolled forward into the RLDP as part of a major employment allocation. Circa 3 ha allocation for 'other uses'	0.1km	Candidate Site Stage 2 for VoG RLDP	Given that this site forms part of an existing allocation in the Adopted LDP and that it is promoted to be rolled over into the new RLDP, it is anticipated that development of the site is likely to come forward in the early part of the plan period. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of Model Farm and the cumulative development to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	Limited information is available for this development. It currently has no proposed development associated with the candidate site and as a result, the impacts and associated biodiversity provision is not known. Whilst the scale of significance of an effect cannot be determined at this stage, the candidate site is less than 100 m from the Model Farm Site. The overlap of both construction phases could lead to a significant adverse effect on bats and breeding birds. The northern boundary of the Model Farm Site has been identified as supporting greater and lesser horseshoe bats. Construction related activities in proximity to this boundary from both developments could lead to elevated noise and dust levels when considered together. This could give rise to a cumulative effect on commuting and foraging bats. Additionally, birds using the Model Farm site (Area A) could also use the cumulative development for similar purposes. Combined habitat loss could elevate the significance of effect to a district scale (significant in EIA terms). Though given the size of Candidate Site 361, mitigation measures could potentially reduce the significance of a cumulative effect if embedded into the design. This is a precautionary assessment as no baseline information for this cumulative development is available.
2024/00329/FUL	Cardiff and Vale College Advanced Technology	Proposed development of the CaVC Advanced Technology Centre (ATC)	0.3 km	Application submitted in June 2024	The application was submitted and validated by the VoG in April 2024. Allowing 6 months for the determination of the application and an additional 6-12 months for the discharge of pre-commencement conditions, it is unlikely that construction would commence at this site until	Whilst the development is separated by some 300 m, with Port Road acting as a dispersal barrier, this cumulative development could give rise to significant cumulative effects on several receptors, namely breeding birds, commuting and foraging

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
	Centre at Cardiff Airport				Q2/Q3 2025. Allowing up to 12 months for construction, works could be complete by Q2/Q3 2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of Model Farm and the cumulative development to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	bats and to a lesser extent priority mammals if construction and operational phases overlap. Woodland and scrub habitats lost to the cumulative development could be used by the bat population within the Model Farm site (Area A), though commuting given the need to commute over Port Road, this may limit the interaction between both sites. The breeding bird assemblage is likely to resemble a similar assemblage to that of the Model Farm site (Area A), including farmland birds, though territory numbers are likely to be less. Arable farmland and grassland are also proposed to be removed as part of the cumulative development. These impacts would likely lead to the displacement of breeding birds and priority mammals, within the same timeframe that the same receptors are experiencing impacts within the Model Farm site. Whilst new hedgerows and trees are proposed for creation within the site to offset the loss of breeding habitat, the central scrub/wooded section within the cumulative development site will be permanently lost and not replaced. Cumulative effects would be adverse and likely to be elevated to a local scale for commuting and foraging bats and breeding birds, though this isn't significant in EIA terms. Cumulative effects on priority mammals aren't expected to be elevated beyond the Site level.
2022/00733/FUL	Land North of the railway line, Rhoose	Erection of 247 new homes, open space, landscaping, access roads and paths and associated infrastructure.	1 km	Submitted, not yet determined	The planning application for this cumulative development was validated in June 2023 and is still pending determination. It is therefore likely that a decision will be due by Q2/Q3 2024. Allowing 6-12 months for the discharge of pre-commencement conditions, it is unlikely that construction would commence at this site until Q2/Q3 2025. Allowing up to 12 months for construction, works could be complete by Q2/Q3 2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm	The cumulative developments are separated by Porthkerry Road and Cardiff Airport, both of which are likely to pose increased noise barriers between both sites. There are no perceived hydrological links. Habitats within the cumulative development site are not considered to be of high conservation value, with the land made up of primarily arable and improved grassland. as reported within ecology documents submitted as part of the cumulative development's application submission. Whilst tree loss is anticipated, no roosting bats have been identified. Dormice and great crested newt are considered to likely absent from the cumulative development site. Bat roosts have also been assessed as likely absent. Multiple breeding birds

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
					Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of Model Farm and the cumulative development to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	of notable conservation status were identified during habitat surveys within the cumulative development site (though no breeding surveys were undertaken recently). Given that the site will be a residential development, any skylark territories are likely to be displaced. Though, given the relatively small size of the site, this is likely to be less than three territories. Whilst hedgerows and boundaries are to be retained or translocated, it is likely that the breeding bird assemblage would be displaced into the neighbouring habitat. With the Model Farm Proposed Development and the cumulative development taken together, there could be a cumulative adverse effect on breeding birds, significant at a local scale, though this isn't considered significant in EIA terms. No other receptor is likely to experience significant cumulative effects.
DNS/3273713	Land at Pen-Onn Solar Farm, Llancarfan, CF62 3AG	Erection of Solar Farm (48 MW) and associated works.	2.25 km	Submitted January 2024, not yet determined	The DNS application for this cumulative development was submitted in January 2024. Allowing 12-18 months for the DNS application to be determined, and then an additional 12 months for conditions to be discharged, it is unlikley that construction would commence before Q3/Q4 2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of Model Farm and the cumulative development to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	This cumulative development is located more than 2 km from the Model Farm Site. As a result, there are no linkages associated with both sites. The cumulative development site is primarily arable farmland and improved grassland, with no predicted loss of any priority habitats. It is acknowledged that breeding habitat for skylark is likely to be lost because of the development. A significant adverse cumulative effect may occur in relation to the population within the county in the absence of mitigation. Though, with the proposed embedded mitigation measures in place as part of the cumulative development, including a wealth of habitat creation and enhancement measures, including species-rich grassland, retained hedgerow habitats and new woodland (increasing the wooded vegetation within the county) cumulative effects are likely to be beneficial in the long-term for skylark populations and other breeding birds, when combined with the biodiversity provisions with the Model Farm site. No other receptors are likely to experience significant cumulative effects that would elevate the significance beyond a Site scale.

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
CAS-01391-M3G6Q9	Fonmon / East Aberthaw Solar	Solar Farm with a potential generating capacity of circa 35MW	2.5 km	Submitted, not yet determined	The DNS application for this cumulative development was submitted in November 2023. Allowing 12-18 months for the DNS application to be determined, and then an additional 12 months for conditions to be discharged, it is unlikely that construction would commence before Q1/Q2 2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of Model Farm and the cumulative development to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	This development proposal is more than 2 km from the Proposed Model Farm Site, as a result there are no linkages associated with both sites. Cumulative impacts could give rise to significant adverse effects particularly on ground nesting birds, specifically skylark. Skylark using the Model Farm Site could also migrate and use areas within or in proximity to this cumulative development (though this is likely at the edge of their foraging range). Significant adverse cumulative effects could occur on the skylark population within the county. Though, the anticipated loss of territories is predicted to be less than three, and as per the Framework Skylark Mitigation Strategy, measures to compensate for the loss of these territories through mitigation delivered on-site and off-site areas for have been sought. No other receptors are likely to experience significant cumulative effects that would elevate the significance beyond a Site scale. As per the avoidance mitigation and enhancement measures set out in the cumulative development's Biodiversity Net Benefit document (which includes the provision of a wealth of new and enhanced habitat types), the cumulative effects of both the cumulative development and the development at Model Farm could result in a beneficial effect in the long-term.
2023/00051/HYB	Land at The Mole, Barry	Hybrid Application made up of: 1. Outline planning permission is sought for the creation of a new 400-berth marina with floating pontoons within the No. 1 Dock at Barry Waterfront. 2. Full planning permission is sought for engineering works to raise the existing ground levels of the Mole site to a minimum of 9.00m AOD in order to- mitigate against potential future flood risk.	3.5 km	Submitted, not yet determined	The planning application for the mole was validated in February 2023 but is still pending determination. It can therefore be anticipated that a decision will likely be issued in Q1/Q2 2024. Allowing 12 months for subsequent Reserved Matters applications and discharge of conditions applications to be approved, it is unlikely that construction would commence until Q1/Q2 2025. Allowing 12 months for construction, construction would likely be completed by Q1/Q2 2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm	Given the distance from the Model Farm site and nature and scale of this cumulative development, which is primarily set within an urban/industrial setting, cumulative effects are unlikely to be significant.

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
		3. On the eastern part of the site outline planning permission is sought for the development of a marina office building which will include facilities for visitors/ members and a restaurant. 4. Adjacent to the marina building outline planning permission is sought for an incubator workspace building comprising offices, smart innovation space, break-out space and a café. 5. On the western part of the site outline planning permission is sought for residential development comprising townhouses and apartments.			Site until Q2/Q3 2026. There is therefore the potential for both the construction period and the operation period of the cumulative development and Model Farm to overlap. Cumulative effects in respect of construction and operation are therefore scoped into the CEA.	
Candidate Site 554	The Port of Barry	179 ha allocated site made up of 5 elements: 1. The Port Access Project 2. The Marina 3. The Mole 4. Black Rocks Growth Zone 5. The Clean Growth Hub	4km	Candidate Site Stage 2 for VoG RLDP	No planning applications for the wider Port of Barry have been submitted to date and therefore it is unclear when construction may commence for other works, although it will unlikely be until post-2026. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for the operation period only of Model Farm and the wider Port of Barry vision to overlap. Cumulative effects in respect of operation onlyare therefore scoped into the CEA	Limited information is available for this development at the current stage. It currently has no outline proposed development associated with the candidate site, and as a result the biodiversity provision is not known. Though, given the candidate site is mostly located within an industrial/urban setting, it is unlikely that significant cumulative effects would arise.
Candidate Site 433	Aberthaw Power Station	189 ha site identified in draft preferred strategy for a green energy park. It is considered reasonably likely	4km	Candidate Site Stage 2 for VoG RLDP	Whilst land has been secured for the proposed Green Energy Park, the consenting process has not yet commenced and therefore there is limited information available in respect of this proposed development. It is however unlikely that an application would be approved and construction	Limited information on the proposed development of this candidate site is available at present. As a result an assessment of the likely significance of cumulative effects cannot be undertaken. Though, given the distance of the candidate site and that the Model Farm Proposed Development will be partly

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
		to come forward but limited info is available.			would commence pre-2026 given that this site is a longer term aspiration of the RLDP. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for the operation period only of Model Farm and the cumulative development to overlap. Cumulative effects in respect of operation only are therefore scoped into the CEA.	operational, with the implementation of the proposed biodiversity provision already underway, effects are unlikely to be significant beyond a Site scale. Though, this would depend on embedded mitigation, secondary mitigation and proposed biodiversity strategy at the candidate site.
2022/00278/RG3	Docks Office, Subway Road, Barry	Transport interchange to integrate bus and rail travel. The transport interchange will utilise the existing council ground level car park area to the east of the Docks offices, creating a circulatory route for buses and taxis, with a central landscaped area with seating, cycle stands and allowing for potential cycle hub / cafe unit and 'Next-bikes' in the future (this would be a separate planning application). The scheme will also have secure cycle lockers and future proof for electric vehicle charging of both buses and taxis. New bus shelters with interactive displays, and new LED lighting to current standards will also be installed.	4.5 km	Full Planning permission granted 29/07/2022. Conditions being discharged and yet to be implemented.	Planning permission for this cumulative development was granted in March 2022 and several conditions have subsequently been discharged. It is therefore likely that construction will commence in Q1/Q2 2024 and allowing for a 12 month construction period, would be completed in Q1/Q2 2025. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for the operation period only of Model Farm and the cumulative development to overlap. Cumulative effects in respect of operation only are therefore scoped into the CEA.	Given the distance between this development and the Model Farm site and the scale and nature of the development, significant cumulative effects are unlikely to arise when considered together.
2019/01260/HYB	Land between Aston Martin Lagonda and taxiway echo	Hybrid planning application comprising: full planning permission for the demolition of existing	7.5 km	Planning permission	Construction on this cumulative development has already commenced although an application to approve the necessary reserved matters has not yet been submitted. It is however, reasonably likely	Given the distance between this development and the Model Farm Site, significant cumulative effects are unlikely to arise when considered together.

Appliction Reference	Project Name	Description	Distance from Site	Status	Timescale	Assessment of Effects
	(Keithrow), Bro Tathan Business Park, St. Athan	structures and for the construction of a new service road, building slab/apron and associated drainage; and outline planning permission for erection of up to 40,000 sqm gross air-side operational employment facilities (Class B1 and/or Class B2 and/or Class B8), vehicle parking, servicing and all associated building and engineering works with all other matters reserved.		granted 01/10/2020	that an application to approve the reserved matters and remainign conditions will be submitted in Q1/Q2 2024. Allowing up to 6 months for these applications to be approved, and an additional 12 months for construction to complete, it is likely that the cumulative development will be completed by Q3/Q4 2025. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for the operation period only of Model Farm and the cumulative development to overlap. Cumulative effects in respect of operation only are therefore scoped into the CEA.	
2023/00780/FUL	Land North of Ffordd Bro Tathan, St. Athan	Demolition of existing buildings/structures and erection of a Class B8 data centre with all associated back-up generators, plant, equipment, sub-stations, accesses, parking and servicing areas, drainage and engineering works including services diversion/connection and regrading works (Full Planning Application)	7.5 km	Planning permission granted 14/06/2024	A planning application for this cumulative development was granted permission in June 2024. Allowing up to 6 months for pre-commencement conditions to be discharged it is likely that construction could commence in Q3/Q4 2024. Allowing 12 months for construction, it is anticipated that the cumulative development could be completed by Q3/Q4 2025. Given that the Appeal for Model Farm will not likely conclude until at least July 2025 and that applications for Reserved Matters and discharge of pre-commencement conditions could take up to an additional 6-12 months, it is unlikely that construction would commence at the Model Farm Site until Q2/Q3 2026. There is therefore the potential for the operation period only of Model Farm and the cumulative development to overlap. Cumulative effects in respect of operation only are therefore scoped into the CEA.	Given the distance between this development and the Model Farm Site, significant cumulative effects are unlikely to arise when considered together.

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