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8. Biodiversity

8.1 Introduction

8.1.1 This chapter presents the assessment of the likely significant effects of the Project with respect to Biodiversity (non-ornithology), including terrestrial and aquatic ecology. The assessment is based on information obtained to date. It should be read in conjunction with the Project description provided in **Chapter 4: Description of the Project** and with respect to relevant parts of the following chapters:

- Chapter 7: Landscape;
- Chapter 9: Ornithology;
- Chapter 10: Water Environment; and
- Chapter 13: Noise.

8.1.2 This chapter describes:

- The legislation, policy and technical guidance that has informed the assessment (**Section 8.2**);
- Consultation and engagement that has been undertaken and how comments from consultees relating to non-ornithology Biodiversity have been addressed (**Section 8.3**);
- The methods used for baseline data gathering (**Section 8.4**);
- Overall baseline (**Appendix 8.1**);
- Embedded measures relevant to non-ornithology Biodiversity (**Section 8.6**);
- The scope of the assessment for non-ornithology Biodiversity (**Section 8.7**);
- The methods used for the assessment (**Section 8.8**);
- The assessment of non-ornithology Biodiversity effects (**Section 8.9**);
- Assessment of cumulative (inter-project) effects (**Section 8.10**);
- A summary of the significance conclusions (**Section 8.10.2**);
- Additional measures proposed (**Section 8.12**); and
- Non-ornithology Biodiversity residual effects assessment (**Section 8.13**).

Limitations and assumptions

8.1.3 The Draft ES has been produced to fulfil Pennant Walters' consultation duties and enable consultees to develop an informed view of the likely significant effects of the Project.

8.1.4 The vast majority of ecology surveys have been undertaken in suitable weather conditions at optimum times of year with reference to best practice guidance. All of the surveys have been completed by suitably qualified surveyors and any limitations in the survey work are detailed in full in **Technical Appendix 8A**. Where any limitations in the collation of baseline information are identified, a precautionary approach to the consideration of potentially significant effects and mitigation is adopted.

- 8.1.5 In summary, limitations to the field surveys include: felling activities affecting woodland habitat subject to dormouse surveys; access restrictions to some buildings during the completion of internal and emergence surveys for bats; restricted access to parts of the Tirpentwys Cut Sites of Importance for Nature Conservation (SINC) quarry due to health and safety reasons; and invertebrate surveys limited to sampling across a number of points onsite so as to be representative of habitat types and elevations experienced across the site, given the limitations of sampling the entirety of the site due to its extensive size. Limitations relating to field surveys are described in full detail in **Appendix 8A**.
- 8.1.6 Additionally, and due to the evolution of the scheme design, turbine locations were changed (added, moved and removed) after completion of the bat surveys. The new turbine locations were assessed in relation to the automated bat detector locations, with automated detectors lying within the impact zone of all but one turbine location (turbine 4). As there are no woodland or individual trees within the impact zone of this turbine, and as an automated detector had been placed along the edge of the nearest woodland, it is considered that this limitation would not have adversely affected the results obtained or the assessment made.
- 8.1.7 Given the above, there are no limitations relating to Biodiversity that affect the robustness of the assessment of the potential likely significant effects of the Project.

8.2 Relevant legislation, planning policy and technical guidance

- 8.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to Biodiversity. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and policy overview**.

Legislation

- 8.2.2 A summary of the relevant legislation is given in **Table 8.1**.

Table 8.1 Legislation relevant to the Biodiversity assessment

Legislation	Legislative context
The Conservation of Habitats and Species Regulations 2017 (as amended)¹	<p>The Habitat Regulations transpose the Habitats Directive² into English and Welsh law.</p> <p>The regulations provide for the designation and protection of European sites, the protection of certain species (referred to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of European sites.</p>
The Environment (Wales) Act 2016³	<p>The Act makes provisions within Wales for the planning and managing of natural resources at national and local level. Section 6 of the Act introduces the biodiversity and resilience of ecosystems duty whereby public authorities are required to seek to maintain and enhance</p>

¹ UK Government (2017). Conservation of Habitats and Species Regulations 2017 (“the Habitats Regulations”) has been amended by (inter alia) the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Online).

² Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna, May 1992.

³ 2 UK Government (2016). The Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> (Accessed 20 September 2022).

Legislation	Legislative context
	biodiversity so far as it is consistent with the proper exercise of those functions. Section 7 of the Act introduces a list of living organisms and types of habitat which are of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales, referred to as priority species and habitats.
The Wildlife And Countryside Act 1981 (as amended) (WCA)⁴	This act consolidates and amends existing national legislation to implement the Bern Convention ⁵ . This piece of legislation remains the primary UK mechanism for statutory site designations (e.g., Sites of Special Scientific Interest (SSSI)) and the protection of individual species listed under Schedules 5 and 8 of the Act, each subject to varying levels of protection.
Countryside & Rights of Way Act 2000⁶	This act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation
The Hedgerows Regulations 1997⁷	The Hedgerows Regulations is intended to protect important countryside hedges from damage or destruction.
Protection of Badgers Act 1992⁸	The Protection of Badgers Act provides protection to badgers and their places of shelter (setts).

Planning policy

8.2.3 A summary of the relevant national and local planning policy is given in **Table 8.2**.

Table 8.2 Planning policy relevant to the Biodiversity assessment

Policy	Policy context
National planning policy	
Future Wales: The National Plan 2040⁹	The Welsh national development framework sets the direction for development in Wales to 2040. Policy 9 – Resilient Ecological Networks and Green Infrastructure outlines measures to ensure the enhancement of biodiversity, the resilience of ecosystems and the provision of green infrastructure.
Planning Policy Wales (PPW) Edition 11, February 2021 - Chapter 6 Distinctive	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government's objectives for Distinctive and Natural Places theme of planning policy topics covers historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface)

⁴ UK Government (1981). The Wildlife and Countryside Act 1981 (as amended). (Online) Available at: <https://www.legislation.gov.uk/ukpga/1981/69/contents> (Accessed 20 September 2022).

⁵ The Convention on the Conservation of European Wildlife and Natural Habitats, 1982. Available at: <https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treaty-num=104> Accessed 20 September 2022).

⁶ UK Government (2000). Countryside and Rights of Way Act 2000. (Online) Available at: <https://www.legislation.gov.uk/ukpga/2000/37> (Accessed 20 September 2022).

⁷ UK Government (1997). The Hedgerows Regulations 1997 (Online). Available at: <https://www.legislation.gov.uk/uksi/1997/1160/contents/made> (Accessed 20 September 2022).

⁸ UK Government (1992). Protection of Badgers Act 1992. (Online) Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents> (Accessed 20 September 2022).

⁹ Welsh Government (2021). Future Wales: The National Plan 2040. (Online). Available at: <https://gov.wales/future-wales-national-plan-2040> (Accessed 20 September 2022).

Policy	Policy context
and Natural Places (11th Ed.; 2021)¹⁰	risks. In particular, the Biodiversity and Resilience of Ecosystems section puts emphasis on planning authorities to have regard for the State of Natural Resources Report (SoNaRR) and Area Statements published by Natural Resources Wales (NRW).
PPW supplementary Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009)¹¹	Technical Advice Note 5 (TAN5) supplements Planning Policy Wales (PPW) and sets out statutory, protection-specific policies in relation to the protection of biodiversity and geological conservation through the planning system. Such policies include those receiving statutory protection under existing legislative provisions (as well as those sites, habitats and species outwith such protection), and aim to ensure that the potential impacts of planning decisions on biodiversity and geological conservation are fully considered.
Local planning policy	
Torfaen County Borough Council (TCBC) Local Development Plan (LDP) up to 2021 (adopted December 2013)¹²	<p>The Torfaen Local Development Plan sets out additional policies including Strategic Policy S7 which requires development proposals to ensure the conservation and enhancement of biodiversity resources.</p> <p>Policy BG1 (Locally Designated Sites for Biodiversity and Geodiversity) also requires development to not be permitted where they would cause significant adverse effects to local nature conservation designated sites unless the development could not reasonably be located elsewhere, and the benefits of the development outweigh the nature conservation value of the site. In addition, adequate mitigatory and/or compensatory provision proportionate to the ecological resources lost will be required alongside enhancements to the ecological resource.</p>
Blaenau Gwent County Borough Council (BGCBC) Local Development Plan (LDP) up to 2021 (adopted November 2012)¹³	<p>The BGCBC LDP includes a number of policies relating to biodiversity. Strategic Policy 10 (SP10) Protection and Enhancement of the Natural Environment: outlines the measures to protect, and, where appropriate, enhance Blaenau Gwent's natural environment and designated landscape, measures include ensuring that:</p> <ul style="list-style-type: none"> • The development does not have a significant effect on the neighbouring Usk Bat Site, Cwm Clydach Woodlands and Aberbargoed Grasslands; • The locally identified Site of Importance for Nature Conservation (SINC) and Local Biodiversity Action Plan (LBAP) species are protected and enhanced; and • The development seeks to produce a net gain in nature conservation by designing in wildlife, and ensuring any avoidable impacts are appropriately mitigated for.

¹⁰Welsh Government (2021) Planning Policy Wales, Edition 11, February 2021. (Online). Available at: <https://gov.wales/planning-policy-wales> (Accessed 20 September 2022).

¹¹Welsh Government, (2009). Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning. (Online) Available at: <https://gov.wales/technical-advice-note-tan-5-nature-conservation-and-planning> (Accessed 21 September 2022).

¹²Torfaen County Borough Council (December 2013). Local Development Plan (LDP) up to 2021. Available at: <https://www.torfaen.gov.uk/en/PlanningAndDevelopment/Planningpolicy/LocalDevelopmentPlan/Local-Development-Plan.aspx> (Accessed 21 September 2022)

¹³Blaenau Gwent County Borough Council (November 2012) Local Development Plan up to 2021. Available at: <https://www.blaenau-gwent.gov.uk/en/resident/planning/local-development-plan/> (Accessed 21 September 2022).

Policy	Policy context
	<p>Additionally, proposal should conform to policies DM14, DM15 and DM16.</p> <p>Policy DM14 refers directly to developments within 10km of the Usk Bat Sites SAC, as well as impacts of developments on Local Nature Reserves (LNRs) and SINCs, ecological corridors and priority habitats and species. Policy DM15 relates to the protection of green spaces, while Policy DM16 relates to the protection to tree, woodlands and hedgerows.</p>
Blaenau-Gwent Local Biodiversity Action Plan 2015	The national strategy for biodiversity is delivered at local level via LBAP. Blaenau Gwent's LBAP is the driver to protect, enhance and manage the biodiversity resource, by setting out objectives, targets and actions for the conservation of biodiversity within Blaenau Gwent.

Technical guidance

- 8.2.4 A summary of the technical guidance for Biodiversity is given in **Table 8.3**, this guidance was used to define the survey methods employed to inform this assessment.

Table 8.3 Technical guidance relevant to the Biodiversity assessment

Technical guidance document	Context
CIEEM (2022)¹⁴ Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (version 1.2 updated April 2022)¹⁵	Provides practical advice for all professionals involved with ecological evaluation and assessment for proposed developments in terrestrial, freshwater, marine and coastal environments.
Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit; JNCC, Peterborough.¹⁶	Presents a standardised system for classifying and mapping wildlife habitats in all parts of Great Britain, including urban areas. The Phase 1 habitat classification and associated field survey technique provides a relatively rapid system to record semi-natural vegetation and other wildlife habitats. Each habitat type/feature is defined by way of a brief description and is allocated a specific name, an alpha-numeric code, and unique mapping colour. The system has been widely used and continues to act as the standard 'Phase 1' technique for habitat survey across the UK.
Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd Edition)¹⁷	A reference guide for ecological consultants working on bat surveys. They are not a prescription for professional bat work and do not aim to override professional judgment and cannot be used to replace experience. Derivations from the methods described are acceptable providing

¹⁴The CIEEM guidelines were published in September 2018 and updated April 2022, hereafter referenced as CIEEM 2022.

¹⁵CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, freshwater, Coastal and Marine, Version 1.1 (online). Available at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/> Accessed 05 May 2022.

¹⁶JNCC (2016) Handbook for Phase 1 habitat survey – a technique for environmental audit (JNCC, Peterborough). Available online at: <https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf> (accessed 20 September 2022).

¹⁷Collins (ed.) (2016). Bat surveys for professional ecologists: Good practice guidelines. 3rd Edition.: Bat Conservation Trust; London.

Technical guidance document	Context
	professional rationale is clear and the ecologist is suitably qualified and experienced.
Bats and Onshore Wind Turbines: Survey Assessment and Mitigation. ¹⁸	This guidance updates best practice information for developers and planners to ensure that onshore wind energy developments post minimal risk to bats. The purpose of this document is to help planners, developers and ecological consultants to consider the potential effects of onshore wind energy developments on bats. The emphasis is on direct impacts such as collision mortality, but there is reference throughout to the need for a full impact assessment requiring a wider consideration of other (indirect) effects.
Priority Habitats of Wales – A Technical Guide ¹⁹	This document provides the evidence base to support the key messages included in Chapter 3 of The State of Natural Resources Report, which presents a summary of the available evidence on the extent, condition and trends of natural resources and ecosystems in Wales.

8.3 Consultation and engagement

Overview

- 8.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Section 4.4 of Chapter 4: Approach to preparing the Environmental Statement.**

Scoping Opinion

- 8.3.2 A Scoping Direction was issued by PEDW, on behalf of the Welsh Ministers, on 06 August 2021. A summary of the relevant responses received in the Scoping Opinion in relation to Biodiversity and confirmation of how these have been addressed within the assessment to date is presented in **Table 8.4.**
- 8.3.3 The information provided in the Draft ES has addressed the comments in the Scoping Direction.

Table 8.4 Summary of EIA Scoping Direction responses for Biodiversity

Consultee	Consideration	How addressed in this Draft ES
Natural Resources Wales (NRW)	NRW returned a preliminary opinion in March 2021 (the Discretionary Advice Service was not available at the time of the request, limited to European Protected Species (EPS), and advised for liaison to	A consultation request was therefore made to the Ecology Officers at Torfaen County Borough Council (TCBC) and Blaenau Gwent County Borough Council (BGCBC) in April 2021.

¹⁸SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> Accessed 05 May 2022.

¹⁹Jones PS, Stevens DP, Blackstock TH, Burrows CR, Howe EA. 2003. Priority Habitats of Wales – a Technical Guide. Bangor: Countryside Council for Wales.

Consultee	Consideration	How addressed in this Draft ES
	<p>be undertaken with the relevant Ecology Officers.</p> <p>NRW broadly agreed with the assessment methodology and scope of survey work, although identified the need to provide further consideration in respect of otter and water vole, and that all ponds within 250m of ancillary infrastructure also be considered.</p>	<p>Survey work has been extended to include the grid connection corridor and access points, as well as to include consideration of otter, water vole, common reptiles, great crested newt and invertebrates in accordance with the NRW response and PEDW Scoping Direction.</p>
<p>Planning and Environment Decisions Wales (PEDW)</p>	<p>PEDW confirmed within the Scoping Direction their agreement with the general scoping approach proposed in respect of designated sites (ID.9 & ID.10), habitats, dormouse (ID.6) , badgers (ID.8) and bats (ID.12), although they concur with NRW with respect to needing further otter and water vole surveys (ID.5) as well as surveys for common reptiles (ID.4) and all ponds within 250m of associated ancillary infrastructure (ID.7). PEDW also set out a requirement for a targeted suitability survey to be undertaken in respect of invertebrates (ID.13).</p>	<p>Survey work has been extended to include consideration of otter, water vole, common reptiles, great crested newt and invertebrates.</p>
<p>Torfaen County Borough Council (TCBC) and Blaenau Gwent County Borough Council (BGCBC)</p>	<p>TCBC and BGCBC have confirmed their agreement with the scope of the survey work proposed, assessment methodology and designated sites to be scoped into the assessment.</p> <p>TCBC highlighted the need to the Environmental Impact Assessment (EIA) to also cover the access point and grid connection corridor.</p>	<p>Survey work has been extended to include the grid connection corridor and access points.</p>

8.4 Data gathering methodology

- 8.4.1 All survey methodologies used within the assessment followed the published guidelines as accepted by the statutory and non-statutory agencies, including NRW and the Chartered Institute for Ecology and Environmental Management (CIEEM). This Ecological Impact Assessment (EclA) follows the standard current guidance in place at the time of writing in 2022, as set out by the CIEEM and recommended by NRW.
- 8.4.2 The scope of the EclA has been determined by current ecological investigations of the Site and in respect of the Scoping Direction from PEDW, which included consultation responses from NRW, TCBC and BGCBC. This process informed the identification of Important Ecological Features (IEFs) pertinent to the proposals, and the likely scope of potential impacts on these receptors.

Study area

- 8.4.3 The Site is centred at approximate Ordnance Survey National Grid Reference S0 235 017 and occupies part of Mynydd Llanhilleth Common located between Abersychan (within TCBC) and Abertillery (within BGCBC), in addition to encompassing former quarry areas

and associated area of coniferous woodland across its southern extents. The Site was initially subject to ecological survey during 2020, which was expanded to encompass additional land parcels, and was subject to additional survey during 2021 and 2022.

8.4.4 The Study Area comprises the following:

- The land within the Site boundary (as shown on **Figure 1.2**);
- The search area for international, national and local designations; and
- The search area for protected/notable species; and
- for the Wind Farm development and Grid Connection Corridor²⁰, the field survey areas for each ecological feature covered during baseline data collection activities.

Desk study

8.4.5 The desk study comprises an important element of the baseline ecological appraisal of a site proposed for development, enabling the initial collation and review of contextual information such as designated sites and past records of protected and priority²¹ species.

8.4.6 The desk study involved collating information from both statutory and non-statutory bodies, including:

- South-East Wales Biodiversity Records Centre (SEWBRc);
- Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales); and
- Multi-Agency Geographic Information for the Countryside (MAGIC²²).

8.4.7 The desk study was undertaken during April 2020 and updated in April 2022 with the following information requested:

- International statutory designations (30km search radius);
- National statutory designations (15km);
- Non-statutory local sites (5km);
- Annex II bat species²³ records (6km search radius); and
- All other protected/notable species records (2km).

8.4.8 These search areas are considered sufficient to cover the potential Zones of Influence (ZoI)²⁴ of the Proposed Development in relation to designated sites, habitats and species.

8.4.9 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 8.5**.

²⁰ The Grid Connection comprises an underground line which runs from the onsite substation to the connection point with the existing network.

²¹ Species which are considered to be of key significance to sustain and improve biodiversity in Wales, as listed under Section 7 of the Environment (Wales) Act 2016.

²² www.magic.gov.uk

²³ Annex II species comprise those listed under Annex II of the Habitats Directive which occur in the UK and for which SACs are designated. The objectives of the National Site Network, which includes all SACs and SPAs, are to maintain or, where appropriate, restore such species to a favourable conservation status. In respect of bats, these include greater horseshoe bat, lesser horseshoe bat, barbastelle and Bechstein's bat.

²⁴ Zone of Influence - the areas and resources that may be affected by the Proposed Development.

Table 8.5 Data sources used to inform the Biodiversity assessment

Organisation	Data source	Data provided
South East Wales Biological Records Centre (SEWBRcC)	SEWBRcC via Aderyn	Species records on or within the vicinity of the study area including all bat species (10km radius), all other protected and priority species (2km radius), international designations (30km radius), National designations (15km radius) and local designations (5km radius).
Multi-Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk	MAGIC	International designations (30km radius), National designations (15km radius) and priority habitats (2km radius).

Survey work

8.4.10 A suite of surveys has been carried out within the Site, comprising the following surveys:

- Extended Phase 1 survey of the Site in April 2020;
- Extended Phase 1 survey of the proposed access route in July 2022;
- Extended Phase 1 survey of the proposed grid connection corridor in August 2022;
- Detailed botanical surveys²⁵ of the Site in May 2020, June 2021 and May 2022;
- Bat roost surveys: ground level visual assessment of mature trees during March, April and May 2021 and during April 2022; ground-level and aerial tree inspections of tree with potential roost features during July and September 2021 and during April and May 2022; ground-level building assessments in March and May 2021; dusk emergence surveys of buildings between May and August 2021; ground-level assessments of quarry/rock faces in March 2021; dusk emergence/dawn back-tracking surveys of quarry rock faces between June and September 2021; dusk emergence/dawn back-tracking surveys of agricultural land adjacent to turbine 5 between June and September 2021;
- Bat foraging/commuting activity surveys: manual transects on seven occasions between May and October 2020 and on four occasions between June and September 2021; automated detector surveys carried out monthly between May and October 2020 and between April and October 2021; deployment of a weather station between August 2020 and October 2021;
- Badger surveys in April 2020;
- Dormouse surveys with tubes deployed in April 2020 and checked between May to November 2020 and April to November 2021;
- Otter and water vole surveys in April 2020, updated in April 2022;

²⁵ Detailed botanical surveys adopted DAFOR methodology whereby plant species are identified according to their abundance (Dominant, Abundant, Frequent, Occasional, or Rare). National Vegetation Classification (NVC) methodology was also utilised where appropriate to classify distinct plant communities and sub-communities supported with respect to their species composition and relative abundance, in addition to determining their botanical value and relative nature conservation value.

- Great crested newt surveys comprising Habitat Suitability Index (HSI) assessment in May 2020 and May 2021; environmental DNA (eDNA) surveys in May 2020 and May 2021; and
- Invertebrate surveys between June and August 2021.

- 8.4.11 The methodology used for these surveys is further detailed at Section 2 of **Appendix 8A**, the Ecology Baseline.
- 8.4.12 Although surveys for common reptiles were scoped out, incidental sightings of common lizard were recorded within the moorland across the Site, and of slow-worm in association with the main access route.

8.5 Overall baseline

- 8.5.1 This section summarises the baseline ecological conditions determined through the course of desk-based and field-based investigations. This section identifies and evaluates those ecological (non-ornithology) features/receptors that lie within the Site's potential Zol, and which are pertinent in the context of the Proposed Development. Further technical details are provided within **Appendix 8A**.

Current baseline

Site Context and Surrounding Habitats

- 8.5.2 The Proposed Development in the main occupies part of Mynydd Llanhilleth Common located between Abersychan (within TCBC) and Abertillery (within BGCBC), in addition to encompassing a former quarry and associated area of coniferous woodland across its southern extents. It lies in the centre of a large, north-south trending ridge of high land between the Cwm Afon valley (Abersychan, Pontypool etc.) to the east, and the Ebbw Fach valley (Abertillery) to the west. This ridge comprises a series of plateaux typically between 400m and 550m above sea level and is characterised by much unenclosed land grazed by sheep, and to a lesser extent cattle and horses. There is much evidence of historic industrial activity on the slopes of the ridge, particularly in the Cwm Afon valley. Areas of plantation forestry are common elsewhere on the slopes of the ridge and drystone walls augmented with post and wire fencing demarcate the edge of the unenclosed area from the surrounding enclosed pastures. These are managed in a relatively intensive manner and appear to be relatively species-poor.
- 8.5.3 A minor public highway, running north-east to south-west, from Abersychan to Llanhilleth, bisects the Study Area. Numerous unmetalled tracks otherwise cross the Study Area. A small stream/flush arises from the block of coniferous woodland/quarry area and flows southwards. Additionally, there are several waterbodies, several being located within the former quarry and created from former quarry workings.
- 8.5.4 Other than the coniferous plantation and former quarry dominating the southern extents of the Study Area, habitats supported by the wider Common area typically comprise five distinct plant communities: heather-dominated dry dwarf shrub heath on the areas of highest elevation; a crowberry-dominated community on elevations slightly below the heather-dominated areas; a bilberry-dominated community below that; a small area dominated by bracken in the east; and relatively species-poor acidic grassland and species-poor rush pasture across the remainder. In addition, there is an area in the north-east of the Study Area where bracken overlies areas of both crowberry-dominated and bilberry-dominated communities.

- 8.5.5 There are several areas where some of these habitats/communities intergrade or form complex mosaics but in general the main distinct habitats predominate. The most complex area of intergraded or mosaic habitat is in the south where acidic grassland and marshy grassland are very difficult to separate into distinct blocks of homogenous habitat.
- 8.5.6 In respect of the proposed access route, this extends circa 3.6km along an existing, surfaced public highway from the urban area of Talywain in the north-east, heading south-westwards towards the Site to a point on the high plateau of Mynydd Llanhilleth Common. Given its length and altitudinal range, the route supports a variety of habitats either side of the highway, with areas of dwarf shrub heath dominated by common heather together with bell heather, bilberry and species-rich grassland being of greatest botanical significance. Such habitats most frequently occur in road cuttings along the middle slopes, and upon spoil tips present across the northern section of the route. Neutral grassland is also supported along the northern section of the route, whilst unimproved and semi-improved acid grassland occurs along the middle section of the proposed access route. The upper reaches (southern section) of the access route where it overlaps with Common typically supporting species-poor acid grassland and species-poor marshy grassland.
- 8.5.7 Regarding the proposed grid connection corridor, this route is primarily centred on an unsurfaced track, with the north-western three quarters of the surveyed area supporting a mosaic of unimproved acid grassland and semi-improved acid grassland with abundant bilberry. Dense bracken frequently occurs to the north of the track. The remainder of the surveyed area otherwise largely comprises semi-improved acid grassland with small areas of dense bracken, marshy grassland and mature and semi-mature parkland trees. A mosaic of scrub, bracken and unimproved acid grassland also occurs at the far south-eastern end of the proposed corridor. Generally, habitats south of the track are tightly grazed or mown/topped and of reduced botanical value.

Designated Sites

- 8.5.8 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. National designations include SSSIs and National Nature Reserves (NNRs). Local level statutory designations include LNRs.
- 8.5.9 No part of the Site is covered by any statutory designations. However, there are a number of such designations within the Site's potential ZoI, as further detailed at **Appendix 8A**.
- 8.5.10 Non-statutory designations are also commonly referred to in planning policies as 'local sites' and are typically considered to be of importance at a County level. In the counties of Blaenau Gwent, Caerphilly and Torfaen, such designations are named SINC. Additional designated sites which should be considered at this level include LNRs and Ancient Semi Natural Woodland (ASNW), where these are not covered by other designations.
- 8.5.11 There are several SINC which are partly present within the Site itself, as well as several blocks of ancient woodland and two local nature reserves. These are further detailed at **Appendix 8A**.
- 8.5.12 Those designated sites that considered to be IEFs, and which are subject to further assessment, are set out in Table 8.5 below.

Table 8.6 Statutory and Non-Statutory Designations Within the Site's Potential Zone of Influence

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
International Sites		
Aberbargoed Grasslands SAC	Measures 42.5 hectares (ha) and situated circa 6km south-west. Qualifying features include <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils and the large and relatively isolated population of marsh fritillary butterfly (<i>Euphydryas aurinia</i>) located across a series of damp pastures and heaths, representing the species on the eastern edge of its range.	International
Usk Bat Sites SAC	Situated circa 8km to the north (closest section), supporting one of the largest maternity roosts of lesser horseshoe bat and a number of important hibernacula within the cave systems, supporting up to 5% of the UK population.	International
Cwm Clydach Woodlands SAC	9km north-west. Cwm Clydach is of particular importance for its stands of beech (<i>Fagus sylvatica</i>) dominated woodland which also support a number of rare and scarce vascular plants and fungi assemblages.	International
River Usk SAC	Located 10km east (closest section). Important for its fish populations including twaite shad (<i>Alosa fallax</i>), allis shad (<i>Alosa alosa</i>), Atlantic salmon (<i>Salmo salar</i>), bullhead (<i>Cottus gobio</i>), river lamprey (<i>Lampetra fluviatilis</i>), brook lamprey (<i>Lampetra planeri</i>) and sea lamprey (<i>Petromyzon marinus</i>). The Site is also important for its otter (<i>Lutra lutra</i>) population and diverse and high-quality riparian habitats supported.	International
Sugar Loaf Woodlands SAC	14km north-east. This SAC supports an internationally important area of western sessile oak woodland as well as beech plantation woodland, heathland, bracken, scrub and grassland.	International
Coed y Cerrig SAC	18km north-east. Coed y Cerrig supports alluvial forests dominated by alder (<i>Alnus glutinosa</i>) and ash (<i>Fraxinus excelsior</i>).	International
Severn Estuary SPA/ SAC/ Ramsar	18km south-east. The Severn Estuary is important for migratory birds with its tidal flats and associated wetlands regularly supporting over 20,000 wintering waterfowl. Internationally important populations of five species of waterfowl are regularly supported by the estuary. These include European white-fronted goose (<i>Anser albifrons albifrons</i>), shelduck (<i>Tadorna tadorna</i>), gadwall (<i>Anas strepera</i>), dunlin (<i>Calidris alpina alpina</i>) and redshank (<i>Tringa totanus</i>). In addition, the islands of Flat Holm and Steep Holm support a nationally important breeding population of lesser black-backed gull (<i>Larus fuscus</i>). The Severn Estuary also regularly supports an internationally important population of Bewick's swan (<i>Cygnus columbianus bewickii</i>), an Annex I species.	International

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
Cardiff Beech Woods SAC	18km south-west. The estuary is also of importance for migratory fish with species such as allis shad, salmon, sea trout (<i>Salmo trutta</i>), sea lamprey, river lamprey, twaite shad and eel (<i>Anguilla anguilla</i>).	International
Llangorse Lake SAC	24km north-west. Important for its aquatic and marginal plants, including several that are rare in this part of Wales. The site also supports several important habitats including submerged and floating plant beds, marginal swamp, fen vegetation, marshy grassland, unimproved grassland, willow scrub and wet woodland.	International
Brecon Beacons SAC	26km north-west. Designated for a range of habitats including calcareous and siliceous rocky slopes supporting rich flora, in addition to dry heaths and hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.	International
Cwm Cadlan SAC	26km north-west. Cwm Cadlan is particularly important for its excellent examples of <i>Molinia</i> meadows and alkaline fens.	International
River Wye SAC	27km east. The site supports an important fish assemblage including species such as twaite shad, allis shad, Atlantic salmon, river lamprey, brook lamprey and sea lamprey. The Site is also important for its otter and white-clawed crayfish (<i>Austropotamobius pallipes</i>) populations. A diverse and high-quality riparian corridor is also supported by the SAC.	International
Blaen Cynon SAC	27km north-west. Supports the largest metapopulation of marsh fritillary butterfly on the southern edge of the Brecon Beacons National Park (BBNP).	International
Wye Valley and Forest of Dean Bat Sites SAC	28km east. The Wye Valley and Forest of Dean Bats SAC is situated across the Wales-England border and is underpinned by four SSSI in Wales and nine in England. The SAC is particularly important for lesser horseshoe bat and greater horseshoe bat (<i>Rhinolophus ferrumequinum</i>) with breeding colonies for both species located within the SAC.	International
Wye Valley Woodlands SAC	28km east. A large woodland site which has some of the best examples of Tilio-Acerion forests of slopes, scree and ravines, Asperulo-Fagetum beech forests and <i>Taxus baccata</i> woods of the British Isles. In addition, lesser horseshoe bats use the woodlands for foraging during the breeding period.	International
National Sites		
Ty'r Hen Forwyn SSSI	0.7km south. Ty'r Hen Forwyn is of special interest for its species-rich neutral grassland and for the association of this habitat with others including acid grassland, scrub, bracken and well-developed hedgerows.	National
Cwm Merddog Woodlands SSSI	5km north-west. Cwm Merddog Woodlands is of special interest for its stands of beech woodland close to the westerly limit of its geographical range. The lower slopes of the Site support large areas of acid flushes with an open carr community dominated by alder and willows (<i>Salix</i> spp.).	National

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
Blorenge SSSI	6km north-west. A large upland site supporting sub-montane heath with large areas of <i>Calluna</i> – <i>Empetrum</i> - <i>Vaccinium vitis-idaea</i> , a community which is of local distribution in south Wales.	National
Aberbargoed Grasslands SSSI/NNR	6km south-west. Aberbargoed Grasslands SSSI is of special interest for its marshy grassland communities and population of marsh fritillary butterfly. Part of Aberbargoed Grasslands SAC.	National
Llandegfedd Reservoir SSSI	6km east. Llandegfedd Reservoir is the largest inland open water habitat in the County and a regionally important area for overwintering wildfowl in Wales. The site is particularly important for the overall numbers and variety of wintering wildfowl, with large numbers of wigeon (<i>Anas penelope</i>), pochard (<i>Aythya ferina</i>) and mallard (<i>Anas platyrhynchos</i>).	National
Memorial Park Meadows Pontllanfraith SSSI	7km south-west. The site supports a large area of unimproved grassland made up of four fields which are the remnants of a traditionally managed farm.	National
Penllwyn Grasslands SSSI	7km south-west. This site supports a mosaic of habitats including wet acid grassland, woodland, scrub and tall herb vegetation, alongside an extensive area of species-rich <i>Molinia</i> grassland representing the <i>Juncus acutiflorus</i> – <i>Erica tetralix</i> sub-community of the <i>Molinia caerulea</i> – <i>Cirsium dissectum</i> fen meadow type which is of very local distribution and confined to south-western Britain. The Site also supports a diversity of macro-invertebrate communities with more than 12 species of butterfly and 90 species of macro-moths recorded including colonies of marsh fritillary butterfly.	National
Siambre Ddu SSSI	Situated circa 8km north of the Site and comprising a component SSSI unit of the Usk Bat Sites SAC, supporting hibernating lesser horseshoe bats within its cave comprising the third largest hibernation site in Gwent for lesser horseshoe bat.	National
Henllys Bog SSSI	8km south-east. Henllys Bog comprises a small fen with a species-rich ground flora. It is the only site in the County for marsh helleborine (<i>Epipactis palustris</i>).	National
Cefn Y Brithdir SSSI	8km west. The steep slopes of Cefn Y Brithdir hill support the best example in mid Glamorgan of a dwarf shrub heath community in which crowberry occurs as a co-dominant species.	National
Gilwern Hill SSSI	9km north. Gilwern Hill is particularly important for its areas of limestone grassland which support several species that are rare in the county.	National
Cwm Llanwenarth Meadows SSSI	9km north-east. Two unimproved meadows supporting a diverse range of plant communities.	National
Mynydd Llangattock SSSI (encompassing	Situated circa 9km to the north-west of the Site and comprising a component SSSI unit of the Usk Bat Sites SAC, supporting	National

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
Craig Y Cilau NNR)	one of the five most important hibernation sites in the UK for lesser horseshoe bat.	
Cwm Clydach SSSI/NNR	9km north-west. Cwm Clydach is of particular importance for its stands of beech dominated woodland which also support a number of rare and scarce vascular plants including whitebeams (<i>Sorbus</i> spp.) and soft-leaved sedge (<i>Carex disperma</i>). Part of Cwm Clydach Woodlands SAC.	National
Coed-Y-Person SSSI	10km north-east. A large area of ancient semi-natural woodland on the steep north facing lower slopes of the Bloreng mountain, which includes one of the most extensive areas of coppice beech in the county.	National
Penpergwm Pond SSSI	10km north-east. Penpergwm Pond is the best example of a natural mesotrophic water body in the county with a diverse emergent flora and a number of national and county rarities.	National
River Usk (Lower Usk) SSSI	10km east. The River Usk (Lower Usk) is particularly important as a rare example of a large mesotrophic lowland river which has not been subject to significant manmade modification. The site is also important for its invertebrate assemblage, otter population, diverse flora, breeding bird assemblage and diverse and high-quality riparian habitats. Part of the River Usk SAC.	National
Priory Wood SSSI	11km north-east. Priory Wood is assessed to be the best remaining example of ancient semi-natural woodland on the Silurian rocks of the Usk Inlier.	National
Nelson Bog SSSI	11km south-west. Nelson Bog is of special interest for its range and diversity of mire communities. The SSSI is also an important ornithological site with over 90 species recorded.	National
River Usk (Upper Usk) SSSI	12km north. The River Usk (Upper Usk) is assessed to be a fine example of an upland river flowing in part over hard sandstones, creating steeply graded sections with rocks, cascades, boulders and cliff-bound banks. The biological diversity of the site is also of partial interest with important populations of fish, breeding, birds, otter, mosses and lichens. Part of the River Usk SAC.	National
River Usk (Tributaries) SSSI	13km north. The Usk system, comprising the River Usk and including its upper tributaries, represents a large, linear ecosystem that acts as an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species. The Usk tributaries support internationally important populations of otter, Atlantic salmon, bullhead, brook lamprey and river lamprey. Part of the River Usk SAC.	National
Plas Machen Wood SSSI	13km south. The site comprises coppice woodland dominated by alder and supporting a diverse ground flora. A number of streams and waterlogged areas support an interesting flora.	National

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
Ruperra Castle & Woodlands SSSI	13km south. The site is of special interest for its maternity roost of greater horseshoe bat. The buildings at Ruperra Castle support a colony of greater horseshoe bats of national and international importance. Coed Craig Ruperra, the woodland area to the north of the roost, is also well used by the bats for foraging and commuting to more distant feeding and roosting areas. Also of interest are the Site's populations of great crested newt and hazel dormouse.	National
Sugar Loaf Woodlands SSSI	14km north-east. Sugar Loaf Woodlands SSSI supports three extensive areas of ancient coppice woodland on the south and east slopes of the Sugar Loaf Mountain.	National
Severn Estuary SSSI	18km south-east. Notified for its internationally important populations of wintering and wading birds of passage, supporting estuarine habitats of ornithological significance. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of dunlin in Britain. The SSSI also supports large populations of migratory fish and a range of saltmarsh habitats which are important for their botanical diversity, supporting several nationally scarce species. The estuary's intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. Also designated as an SPA/SAC/Ramsar site.	National
Local Sites		
Blaen-y-cwm Upland Pasture SINC (T6)	Overlapping with common land occurring across the centre of the Site and with Mynydd Llanhilleth Common SINC. Supports sheep grazed acid grassland/marshy grassland. Suitable for important bird species.	Local
Blaensychan Valley SINC (T5)	Abuts the north-eastern edge of the Site. A post-industrial site including ancient woodland, revegetated colliery spoil, bare ground, neutral and calcareous grassland. Important for invertebrates, reptiles and flora.	Local
Cwm Ddu Woods, Blaenserchan SINC (T27)	Overlaps with the north-eastern extent of the Site. This SINC supports ancient woodland, dwarf shrub heath, hedgerows, colliery spoil, a stream, small ponds and disused buildings.	Local
Cefn y Crib SINC (T11)	A small part of this SINC overlaps with the southernmost field onsite. Primarily supports acid and calcareous grassland.	Local
Graig Ddu/Gelli-Deg Wood SINC (T42)	A small part of this SINC overlaps with broadleaved woodland occurring at the far eastern end of the Site. An ancient woodland site on relatively high ground dominated by beech and oak.	Local

Designation	Approximate Distance from Site & Key Attributes	Nature Conservation Importance
Mynydd Llanhilleth Common SINC (T55)	Common land occurring across the centre of the Site (and overlapping with Blaen-y-cwm Upland Pasture SINC), in addition to fields to the south, this SINC supports a mosaic of upland habitat types including acid grassland, dwarf shrub heath, wet and dry heath and mire communities. Notable species supported include red grouse, wintering short-eared owl, upland breeding birds, olive earthtongue and reptiles.	Local
Tirpentwys Cut SINC (B39/T92)	Overlapping with coniferous plantation and former quarry areas situated across the southern extent of the Site. This SINC supports a mosaic of habitats including bog habitats and flushes, standing open water, post-industrial quarry and rock exposures. A significant site for breeding birds with several schedule 1 and notable bird species recorded within the Site including peregrine falcon, hobby, merlin, long-eared owl, reed bunting, crossbill, cuckoo, kestrel, linnet, tree pipit, raven, redpoll and redstart.	Local
Waun Wen & Cwmyrgwm SINC (T108)	Overlapping with the far north-eastern extent of the Site. Comprises a large expanse of dry heath/acid grassland mosaic.	Local
Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25)	Overlapping with the north-western corner of the Site. Comprises an area of upland common land between two valleys and supports extensive dry heathland communities, as well as smaller areas of wet heathland, blanket mire, acid grassland, heather and bracken. This SINC also supports the Silurian moth (<i>Eriopygodes imbecilla</i>) (a priority species).	Local
Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35)	Overlapping with the access route in the northeast of the Site. Comprises acidic grassland and dry acidic heathland.	Local
Mount View, Blaen-y-Cwm SINC (T51)	Overlapping with a very small part of the south-eastern part of the Site and access route. Comprises acidic grassland (some on colliery spoil).	Local
Penrhiwfid Fields SINC (T68)	Overlapping with the very eastern end of the Site. Comprises neutral species-rich grassland.	Local
Rhiw Frank Meadows SINC (T82)	Overlapping with the eastern end of the grid connection corridor. Comprises neutral/acid grassland.	Local
The British SINC (T91)	Overlapping with the access route in the north-east of the Site. Comprises a high value mosaic habitat including ancient woodland.	Local
Blaen-y-cwm Upland Pasture SINC (T6)	Overlapping with Mynydd Llanhilleth Common SINC occurring across the centre of the Site. Sheep grazed acid grassland with marshy grassland.	Local

Habitats

- 8.5.13 The distribution of different habitat types within and adjacent to the Site is described in detail within **Appendix 8A**.
- 8.5.14 Those habitat types considered likely to be impacted by the Proposed Development which require further consideration are listed in Table 8.6 below.

Table 8.7 Potential IEFs (habitats) present within the Site’s potential Zone of Influence

Potential IEF	Approximate Distance from Site and Key Attributes	Nature Conservation Importance
Habitats - Onsite		
Former quarry areas and associated coniferous woodland	Former quarry areas located centrally within the Site. Surrounding block of coniferous woodland subject to clear felling at the time of writing. Overlaps with Tirpentwys Cut SINC.	Local
Broadleaved semi-natural woodland	Areas of broadleaved woodland onsite overlap with Cwn Ddu Woods SINC and Graig Ddu/Gelli-Deg Wood SINC.	Local
Heathland (including heathland/bracken mosaic)	Dominates the northernmost extents of the Site and overlaps with Mynydd Llanhilleth Common, Blaen-y-cwm Upland Pasture and Waun Wen & Cwmyregwyn SINC.	Regional
Acid grassland (unimproved and semi-improved)	Areas supporting acid grassland onsite overlap with Mynydd Llanhilleth Common, Blaen-y-cwm Upland Pasture, Waun Wen & Cwmyregwyn and Cefn y Crib SINC.	Local
Bracken	Bracken is frequent across the Site, predominantly forming mosaics with dwarf shrub heath and grassland habitats. Dense stands also present.	Site
Marshy grassland	Areas of marshy grassland often forms a mosaic with smaller areas of species-poor acid grassland. Overlaps with Mynydd Llanhilleth Common and Blaen-y-cwm Upland Pasture SINC.	Local
Improved grassland	Agricultural fields occur across the western, south-western, south-eastern and north-eastern extents of the Site and support species-poor, semi-improved and improved grassland dominated by agricultural grasses.	Negligible
Semi-improved neutral grassland	Limited in extent, present across a field to the north-west and a further field south-east of the Site and subject to sheep and horse grazing. Frequent populations of eyebright notable within the north-western field.	Site
Scrub (including mosaic of semi-improved acid grassland and scattered scrub)	Scrub habitat recorded in association with the field boundaries, margins of waterbodies and scattered across valley slopes and quarry faces. Also recorded in association with the boundaries of the residential properties adjacent to the Site.	Negligible

Potential IEF	Approximate Distance from Site and Key Attributes	Nature Conservation Importance
Hedgerows and tree lines	Limited in extent and quality, confined to agricultural field boundaries and comprise native hedgerows which are predominantly defunct and species poor.	Local
Aquatic features	Includes waterbodies, watercourses and wet/dry ditches. Widespread across the Site.	Local
Hardstanding and buildings	Associated with the Blaen-nant-y-caws farm.	Negligible
Habitats – Main Access Route		
Dwarf shrub heath	Dwarf shrub heath recorded in the road cuttings along the middle slopes but also occurs in the lower parts (northern sections) of the main access route upon old spoil tips.	Regional
Unimproved & semi-improved acid grassland	Present across the middle reaches of the main access route. The upper reaches (Mynydd Llanhilleth Common; southern section) typically support species-poor acid grassland. Two populations of common cudweed recorded here.	Local
Unimproved & semi-improved neutral grassland	Species-rich sections of neutral grassland occur across the lower reaches (northern section) of the main access route.	Local
Marshy grassland	Small pockets scattered along the main access route.	Site
Broadleaved semi-natural woodland & dense scrub	Semi-mature broadleaved woodland present across the middle reaches of the access road, near the former British Ironworks Colliery compound. Dense scrub otherwise dominates the lower reaches (northern section) of the main access route, forming a mosaic in places with neutral grassland and tall herbs.	Local
Dense bracken	Dense stands occur over acid grassland on steep slopes. Bracken invasion common along the road verge across the middle reaches.	Site
Aquatic features	A steep-sided stream valley traverses the main access route north-west – southeast by the former British Ironworks Colliery compound. A shallow area of standing water lies along the existing hardstanding track	Local
Built Structures	Buildings associated with the derelict British Ironworks Colliery compound, including a brick-built engine house and other structures of more modern construction.	Negligible
Habitats – grid connection corridor		
Dwarf shrub heath	Present across the north-western area of proposed corridor forming areas of open vegetation. Forms a mosaic with acid grassland, bracken and scattered scrub.	Local

Potential IEF	Approximate Distance from Site and Key Attributes	Nature Conservation Importance
Unimproved & semi-improved acid grassland	Present across the north-western area of proposed corridor, in association with dwarf shrub heath and an area of dense bracken.	Local
Marshy grassland	Limited to a small, species-poor area at southern most end of the grid connection corridor (area B).	Site
Poor semi-improved grassland	Species-poor semi-improved grassland limited to far southern end of the grid connection corridor (area B) and along area E.	Negligible
Bracken & scrub	Scattered bracken and scrub occurs at the far south-eastern end of the grid connection corridor (area A). Dense bracken also dominates habitats to the north of the track.	Site
Broadleaved semi-natural woodland & secondary woodland	Present across the south-eastern extent of proposed corridor in association with a small stream (Nant Ddu).	Local
Coniferous plantation woodland & recently felled woodland	A small plantation dominated by Sitka spruce (<i>Picea sitchensis</i>) is located on the northern side of the track towards the eastern end of the grid connection corridor (T4), with trees likely less than 40 years old with poor growth. An area of felled woodland is also present here (area D), where semi-mature coniferous trees have been felled within the past five years or so, with dense bracken now dominant. Occasional spruce and larch (<i>Larix</i> sp.) trees exist here, alongside beech and silver birch standards and young rowan and hawthorn trees.	Site
Built structures	Ruined stone dwelling present on an area of hillside known as Rhiw Frank (area T6).	Negligible

Protected and/or Notable Species

- 8.5.15 Details of the surveys undertaken for protected species and their distributions within the Site are described in detail in **Appendix 8A**.
- 8.5.16 Pertinent desk study results for those species considered likely to be impacted by the Proposed Development which require further consideration are listed in **Table 8.8** below.

Table 8.8 Potential IEFs (species) within the Site's Potential Zone of Influence

Species (excluding birds)	Desk Study Records Pertinent to the Site	Nature Conservation Importance
Bats	The desk study returned multiple bat activity records within 10km of the Site, representing a combined total of 13 species as well as numerous records relating to <i>Myotis</i> and pipistrelle bat species. Bat species records are relatively evenly distributed within 10km of the Site. However, there are noticeable concentrations of bat species	Local

Species (excluding birds)	Desk Study Records Pertinent to the Site	Nature Conservation Importance
	<p>records around urban settlements and at lower elevations, the majority of which relate to small numbers of commuting/ foraging bats. Bat species records become noticeably sparse at higher elevations with only single records for noctule and common pipistrelle within the boundary of the Site. However, despite limited records for the Site itself, there are several records relating to common pipistrelle, brown long-eared bat, lesser horseshoe bat and myotis bat species roosts from within a variety of structures situated between Pontypool and Talywain, with the closest confirmed roost supporting low numbers of lesser horseshoe bat approximately 900m to the north-east of the Site's eastern boundary.</p> <p>With respect to roosting bats, a common pipistrelle and noctule bat were recorded to be roosting onsite within Tirpentwys Quarry during 2011. In addition, roosts comprising low numbers of common pipistrelle, lesser horseshoe bat and brown long-eared bat are present within 2km of the Site. The closest of these relates to a pipistrelle maternity roost located approximately 700m to the north-west of the Site within the village of Six Bells. Further afield and within 10km of the Site, numerous roosts relating to Brandt's bat, brown long-eared bat, common pipistrelle, Daubenton's bat, greater horseshoe bat, lesser horseshoe bat, Myotis sp., Natterer's bat, noctule, soprano pipistrelle, serotine and whiskered bat are present.</p> <p>Regarding Annex II bat species, several roosts for both lesser horseshoe bat and greater horseshoe bat are located within 10km of the Site. The majority of these records are associated with built structures at Pontypool and Cwmbran, with a cluster of roosts also identified along the section of the A465 between Brynmawr and Gilwern. Those records along the A465 corridor are primarily associated with the nearby cave network, road culverts and disused railway tunnels and have been identified through long-term detailed surveys and monitoring associated with the dualling of the A465. Comparatively, there are significantly fewer greater horseshoe bat records compared to lesser horseshoe bat records, with those for greater horseshoe bat predominantly confined to the Brynmawr to Gilwern A465 corridor, with a record for a bat roosting within a cave close to Blaenavon and a night roost located at a farm near Llandegveth. A single record for barbastelle bat was also returned from 2021, situated circa 4.9km to the south-west of the Site near Newbridge. No records for Bechstein's bat within 10km of the Site were returned during the desk study.</p>	
Badger	A total of four records for badger were returned during the desk study. Two records relate to roadkill circa 1.7 and 2.2km to the south of the Site, dated 2002 and 2017 respectively. Remaining records relate to badger evidence recorded circa 1.7km to the north of the Site in 1995 and 2km to the south of the Site in 2007.	Local
Dormouse	No records were returned for dormouse within 2km of the Site, although a record for this species dating back to 2003 exists for a block of woodland situated circa 5km south of the Site. Habitat connectivity between the Site and the recorded location is limited onsite, whilst habitats supported by the Site are generally assessed	Site

Species (excluding birds)	Desk Study Records Pertinent to the Site	Nature Conservation Importance
	as being sub-optimal for this species. Nevertheless, to ensure a robust approach a presence/absence survey was undertaken over the course of 2020 and 2021, limited to surveying areas of woodland associated with the former quarry and along the north-eastern boundary of the Site.	
Otter and water vole	Numerous records relating to otter field signs (predominantly spraints) were returned during the desk study assessment, the majority of which are associated with the River Ebbw located approximately 1km to the west of the Site. This includes a collection of nine spraint sites found along a section of this river close to the village of Aberbeeg, located approximately 1.4km to the west of the Site, recorded as recently as 2013.	Local
Great crested newt	A desk study assessment returned no records for great crested newt within a 2km radius of the Site. There is, however, a record for great crested newt located approximately 2.3km to the south of the Site at Pen-y-caeau Farm, dating from 2010. However, numerous barriers of dispersal, most notably the A472 road, are present between this record and the Site.	Local
Common reptiles	A number of records for common lizard and slow-worm occurring within and adjacent to the Site were received during the desk study assessment. The most recent common lizard record retrieved during the desk study assessment relates to a record in 2018 of an individual seen within Tirpentwys Cut SINC located within the southern portion of the Site. As for slow-worm, the closest record dates back to 2015 and relates to a dead individual recorded circa 213m to the north-east of the Site. In addition, a record was also returned circa 450m to the north-east of the Site for a sighting of six individuals in 2017. More generally, whilst the majority of records relate to only small numbers of slow-worm, approximately 30 individuals were recorded during a 2007 survey located approximately 800m to the north-east of the Site, at an area of old ironworks known as the 'British'.	Local
Invertebrates	With respect to invertebrates, the desk study returned several records of notable invertebrate species, mostly of the order lepidoptera, within a 2km radius of the Site. Of those lepidoptera, SEWBReC returned several records of priority butterfly species. In addition, several notable dragonfly and damselfly species were returned from within a 2km radius of the Site.	County

Bats

Roosting

- 8.5.17 In respect of roosting bats, detailed tree inspections undertaken between March 2021 and April 2022 of all suitable trees within the vicinity of the proposed turbine locations confirmed the presence of 22 trees onsite with high potential to support roosting bats, 54 trees with moderate potential and 49 trees with low potential. Remaining trees were downgraded to negligible potential to support roosting bats. No evidence of tree roosting bats was confirmed during the survey effort however.

- 8.5.18 In respect of mature and semi-mature trees occurring in the vicinity of the main access route, these are considered to have only low to negligible potential to support suitable roost features for bats. Mature and semi-mature trees occurring at the south-easternmost end of the proposed grid connection corridor route are also considered to have potential to support roosting bats.
- 8.5.19 With regards to built structures onsite, a visual assessment completed between March and May 2021 identified nine clusters of buildings within the Site (B1-B20). Of these, eight structures (B1, B2, B3, B6, B9, B9a, B10 and B15) were considered to have moderate potential to support roosting bats, whilst one structure (B11) was considered to have low potential. All other remaining structures assessed were considered to be of negligible potential to support roosting bats. In addition, quarry faces associated with Tirpentwys Cut SINC are considered to have high summer roosting and hibernation potential.
- 8.5.20 Dusk emergence surveys undertaken of buildings B6, B9, B9a, B10, B11 and B15 between July and August 2021 confirmed the presence of a summer day roost for low numbers of common pipistrelle bats supported by B10. No bats were recorded emerging from buildings B6, B9, B9a, B11 and B15 however, such that bat roosts are presumed absent from these buildings. No access to buildings B1-B3 with moderate bat roost potential was permitted.
- 8.5.21 Bat roost back tracking surveys undertaken of the central, northern and southern quarry faces associated with Tirpentwys Cut SINC did not confirm any evidence of bat roosts, with no discernible emergence, commuting or roost swarming behaviour noted. Despite the potential of the central quarry faces to support roosting features for crevice dwelling bats, there was no observable commuting behaviour from the central areas to the northern or southern edges of the quarry, with the first registrations of bat activity often recorded sometime after sunset. However, access constraints including low light levels, uneven ground and dense vegetation prevented any meaningful tracking of a bat assemblage to a specific roosting location. Bat activity was instead dominated by foraging individuals predominantly travelling east-west along the edge of coniferous woodland however.
- 8.5.22 Bat roost back tracking surveys undertaken of agricultural land associated with Turbine 5 did record early registrations of bat activity however, predominantly originating from the south and likely back tracked to building B10 confirmed to support a common pipistrelle summer roost. Several common pipistrelle bats were also observed commuting west to east from offsite woodland and from woodland habitats offsite to the north. Although originating from offsite, such that activity could not be tracked back to a definitive location, it is likely that woodland habitat to the west and north supports potential roosts of this species. Grazed pastures delineate these habitats, providing a suitable foraging resource and cover for a bat assemblage commuting across the immediate landscape. The Site is otherwise dominated by open pasture associated with Llanhilleth Common, with no bats observed commuting across such habitats to/from potential roost sites.
- 8.5.23 In respect of the main access route, derelict buildings at the redundant British Ironworks Colliery compound, including the brick-built Engine House, are considered to have potential to support roosting bats, albeit limited for those structures of relatively modern construction. With regards to the proposed grid connection corridor, the ruined structure at Rhiw Frank is also considered to support a number of potential roost features, given the presence of a number of gaps within the surviving stonework, together with the structure's south facing and sheltered position.

Activity

- 8.5.24 A total of nine bat species/species groups (*Myotis* and *Plecotus* species were not always identified to species level) were recorded foraging and/or commuting across the Site

between May and October 2020 and May and October 2021, including the following species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared bat, *Myotis* bat species, noctule, serotine, greater horseshoe bat and lesser horseshoe bat.

- 8.5.25 During 2020, the vast majority of registrations recorded by the automated detectors relate to common pipistrelle (93%), which was similarly the case in respect of the walked transect surveys (94% on average). *Myotis* bat species, soprano pipistrelle and noctule otherwise dominated the remainder of bat registrations in respect of the automated detectors (2.5%, 1.5% and 1.5% respectively) and walked transects (1.3%, 2.8% and 1.2% respectively).
- 8.5.26 In respect of long-eared bat, lesser horseshoe bat, serotine, greater horseshoe bat and Nathusius' pipistrelle, these species were otherwise infrequently recorded during 2020, together comprising only c. 1.5% combined of combined registrations recorded by the automated detectors and 0.7% combined of combined registrations recorded during the walked transect surveys. Nathusius' pipistrelle (comprising 0.01% of total registrations) and greater horseshoe bat (comprising 0.07% of total registrations) were the least encountered species during the automated detector surveys. With respect to Nathusius' pipistrelle, this species was only registered by a single automated detector in June (two registrations at detector location L05) and September (two registrations at detector location L03). With respect to greater horseshoe bat, registrations were recorded during the manual walked transect in September 2020 and by automated detectors in July (one registration at detector location L08), August (three registrations at detector location L03 and one registration at detector location L08) and September (detector locations L02, L03, L04, L06, L08 and L09; between one and five registrations per detector) only.
- 8.5.27 During 2021, The vast majority of registrations recorded by the automated detectors also relate to common pipistrelle (93%). *Myotis* bat species, lesser horseshoe bat and soprano pipistrelle otherwise dominate the remainder of bat registrations in respect of the automated detectors (2.8%, 1.9% and 1.5% respectively). In respect of the walked transect surveys, only very low levels of bat activity was observed across the northern extents of the Site, attributed primarily to common pipistrelle, with exception to five passes recorded during the August 2021 survey for soprano pipistrelle.
- 8.5.28 In respect of noctule, serotine, long-eared bat, greater horseshoe bat and Nathusius' pipistrelle, these species were only infrequently recorded by the automated detectors during 2021, comprising only c. 0.8% of registrations. Similarly, to 2020, Nathusius' pipistrelle (comprising 0.01% of total registrations) and greater horseshoe bat (comprising 0.03% of total registrations) were the least encountered species during the automated detector surveys. With respect to Nathusius' pipistrelle, this species was only registered by a single automated detector in June (two registrations at detector location L07) and September (one registration at detector location L04), and by two automated detectors in August (two registrations at detector location L05 and one registration at detector location L06). With respect to greater horseshoe bat, registrations were recorded by automated detectors each month between June and October, with a single registration in June, 13 in July, 12 in August, 22 in September and 3 in October.

Ecobat (Collision Risk) Assessment

- 8.5.29 Following best practice guidance²⁶, in respect of turbine locations, Turbines 3, 4, 7 and 8 are considered as having a low habitat risk given the absence of potential roosting features nearby and low-quality foraging habitat within close proximity. Turbines 1, 2, 5

²⁶NatureScot (2019) Bats and Onshore Wind turbines – Survey, Assessment and Mitigation (<https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>; last accessed 29/09/2022).

and 6 are considered as having a moderate habitat risk, however. This is due to the proximity of buildings and/or trees with moderate to high potential to support roosting bats, including the presence of a summer day roost supporting low numbers of common pipistrelle bats within building B10, which lies to the east of Turbine 6, in addition to the presence of suitable habitat which could otherwise be extensively used for foraging purposes. It is not considered that any of the turbine locations would have a high habitat risk however, given the absence of mature semi-natural woodland nearby, and whilst a common pipistrelle roost supporting a low number of individuals is confirmed for built structure B10 located to circa 305m to the east of Turbine 6,, this is not considered to be a 'key roost and/or swarming site'. As such, the location of Turbine 6 can be considered to be of moderate habitat risk.

- 8.5.30 The Site as a whole is therefore considered to overall have moderate habitat risk for bats.
- 8.5.31 With respect to project size, the Proposed Development is considered to be small with regards to the number of turbines (fewer than 10 turbines). However, a number of other wind energy developments exist within 5km of the Site, whilst proposed turbine heights are over 100m. As such, the project size is deemed to be 'large' for the purposes of this assessment.
- 8.5.32 With a large project size and an overall moderate habitat risk for the Site therefore, the site risk level, in accordance with best practice guidance, is considered to be a 'high site risk'.
- 8.5.33 In respect of detector locations, five detector locations have 'high' levels of activity, as well as having an overall risk assessment²⁷ of 'high', these being detector locations L01, L03, L04, L06 and L10. Location L01 lies near to Turbine 2, L03 and L04 lie nearest to Turbine 3 (L04 lies 280m from any turbine location), and L06 lies near to Turbine 5. Detector location L10 lies further than 280m from any turbine location, however it lies between Turbines 4 and 5. Given that five detector locations have an overall risk assessment of 'high', the maximum, overall risk assessment for the Site is therefore 'high'. However, the average risk assessment for the Site is considered to be 'medium' (being the most frequently occurring overall risk assessment), which has been calculated by taking the average overall risk assessment score for the Site, as per best practice guidance²⁸.
- 8.5.34 In Wales, lesser horseshoe and brown long-eared bats are species with a low vulnerability to collision (as well as being of low collision risk), whilst common pipistrelle and soprano pipistrelle (high collision risk species), as well as *Myotis* and greater horseshoe bat (low collision risk species) are species with a medium vulnerability to collision. Serotine (a medium collision risk species), noctule and *Nathusius'* pipistrelle (both high collision risk species) are species with a high vulnerability to collision²⁹.
- 8.5.35 Of those species with high vulnerability, the greatest impacts on serotine, noctule and *Nathusius'* pipistrelle (albeit significantly lower levels of activity from this species were recorded) are considered likely to occur in August and September.
- 8.5.36 For those species with medium vulnerability, the greatest impacts on greater horseshoe bat are also considered likely to occur in August and September. In respect of common pipistrelle, soprano pipistrelle and *Myotis*, these species are present within the Site in

²⁷SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter & Bat Conservation Trust (BCT) (2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation Available at: <https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation> Accessed 05.05.22

²⁸NatureScot (2019) Bats and Onshore Wind turbines – Survey, Assessment and Mitigation: Table 3b: Stage 2 – Overall risk assessment. Calculated as follows: $15+9+15+15+12+15+12+9+8+15+12+9 / 12 = 12 =$ 'Medium' risk assessment.

²⁹As detailed at Table 2 (Wales) within NatureScot (2019) Bats and Onshore Wind turbines – Survey, Assessment and Mitigation (<https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>; last accessed 29/09/2022).

similar levels throughout the year. However, it is considered that the greatest impacts on common pipistrelle are considered likely to occur during June/July and September/October, during August for soprano pipistrelle, and between August and October for *Myotis*.

- 8.5.37 Overall therefore, the greatest impacts upon bat species considered to be of high and medium vulnerability to collision risk are likely to occur between August and September/October.

Badger

- 8.5.38 No evidence of badger activity or their setts were recorded during the initial survey nor during subsequent survey visits to the Site throughout 2020, 2021 and 2022.
- 8.5.39 Based upon the findings to date, badgers are likely absent from the Site and are thus scoped out from further assessment.

Dormouse

- 8.5.40 Dormouse surveys conducted between May and November 2020 and between April and November 2021 found no evidence of dormice. In addition, no evidence of wood mouse (including individuals, nests and food caches), or signs of other mammal usage were recorded during the surveys.
- 8.5.41 Based upon the findings to date, dormouse is likely absent from the Site and is therefore scoped out from further assessment.

Otter and water vole

- 8.5.42 Otter surveys conducted in April 2020 and April 2022 of the main Site confirmed all aquatic features present to be of negligible value to support otter, being small in size, ephemeral and subject to drying in the summer months and/or isolated from more suitable aquatic features otherwise present in the wider landscape. A survey of the grid connection corridor during August 2022 also confirmed the absence of suitable habitat for this species.
- 8.5.43 With respect to the main access route however, an otter spraint was recorded in April 2022 upon a large boulder located alongside the stream Cwmsychan Brook, immediately downstream of the road bridge to the east of the redundant colliery buildings at the British. No evidence of actual or potential otter breeding or resting places have been recorded along the section of this Brook however, such that this species likely uses this section of the brook for foraging and dispersal only.
- 8.5.44 With respect to water vole, surveys conducted in April 2020 and April 2022 of the main Site confirmed all waterbodies to be of negligible importance to support this species, particularly given the absence of any surface water connectivity between aquatic features onsite and suitable aquatic habitat in the wider landscape. Former excavation and mining operations within the quarry areas also likely preclude the presence of water vole within waterbodies P1, P3, P8, P9 and P10, whilst their stony bankside substrate is assessed to be largely unsuitable for burrowing. Similarly, there is an absence of suitable habitat/burrowing and foraging opportunities across other aquatic features onsite, with many features onsite being dry or ephemeral in nature and of shallow water depth. Suitable habitats for this species were also deemed absent or of negligible potential along the main access route and grid connection corridor. Based upon the findings to date therefore, water vole is likely absent from the Site and is therefore scoped out from further assessment.

Great crested newt

- 8.5.45 Ten waterbodies occur within the Site, primarily situated in and around the central quarry areas. The habitat suitability assessment undertaken in May 2020 and May 2021 confirmed pond P10 to be of 'excellent' suitability to support great crested newt, whilst ponds P1, P2, P2A, P3 and P7 are assessed to have 'good' suitability. In addition, ponds P4 and P7A are assessed to be of 'average' suitability, whilst pond P8 is of 'below average' suitability and ponds P6 and P9 of 'poor' suitability. In addition, a small area of impeded drainage was noted along the proposed access route connecting turbines 4 and 8 through the central quarry area during August 2022. This feature is deemed of negligible potential to support great crested newt, comprising a shallow, ephemeral pool created by wheel ruts and subject to regular disturbance by vehicular movements.
- 8.5.46 With respect to the main access route, a further three ponds, A-C, occur within 250m of the route, all of which were confirmed to be dry during the July 2022 survey. A fourth pond, pond D, situated circa 285m to the south of the route was confirmed to hold water however, and was assessed as having 'good' suitability to support great crested newt.
- 8.5.47 Water sampling surveys undertaken in May 2020 and May 2021 of ponds P1-P4 and P7-P10 (with no access possible to pond P5 and P6 being dry at the time of the survey) confirmed the absence of great crested newt eDNA. With respect to pond D, given that the access route occurs circa 285m from this feature at its closest point, with proposed works to the existing surfaced highway limited to widening by circa 2m, no impacts are considered likely to arise upon this species should a population be present in the locality.
- 8.5.48 As such great crested newt is considered absent from the Site and thus can be scoped out from further assessment.

Reptiles

- 8.5.49 During the course of the ecological surveys undertaken across the Site between 2020 and 2022, only occasional incidental sightings of common lizard were recorded, with sightings confined to moorland habitats present across the Site. An incidental sighting of slow-worm was also observed in association with the main access route. The Site is therefore confirmed to support at least a low population of common lizard³⁰, whilst a low population of slow-worm is also likely present in association with those habitats aligning the main access route. The presence of grass snake and adder should also not be ruled out however, given the general suitability of habitats across the landscape more generally.
- 8.5.50 Given the relative widespread distribution of common reptiles across South Wales³¹ therefore, this species group is considered to be of importance at the Local Level only.

Invertebrates

- 8.5.51 Overall, the Site provides an important refuge for uncommon invertebrates declining in the wider countryside and/or habitat specialists with restricted distributions in Britain. Circa 12% of those species recorded are considered to be of conservation importance in a regional (vice-county), Welsh and/or British context, including: one priority³² species; 1

³⁰ As set out in Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards. HGBI Advisory Notes for Amphibian and Reptile Groups (Args). HGBI, 1998.

³¹ As illustrated by the distribution maps found at <http://www.arc-trust.org/advice/species-id/reptiles>

³² Species listed under Section 7 of Environment (Wales) Act 2016 as being of principal importance for conservation of biological diversity in Wales.

near threatened³³ species; 7 nationally scarce/notable³⁴ species; 32 nationally local³⁵ species; and 5 other species of conservation importance. Nevertheless, there is an absence of highly threatened species (e.g., Critically Endangered, Endangered or Vulnerable) occurring onsite, whilst the majority of species of 'conservation interest' within the Site are Nationally Local and not currently considered to be 'threatened'.

- 8.5.52 The invertebrate population supported by the Site is therefore considered to be County Level importance.

Future baseline

- 8.5.53 Should the Proposed Development not proceed, it is considered that land practices would likely remain the same, with the majority of the grassland and moorland areas continuing to be grazed and the coniferous plantation commercially managed. Current recreational use within the Survey Boundary is also likely to remain the same or potentially increase slightly over time in line with population growth in the local area. The future baseline is therefore unlikely to be markedly different from the current baseline in respect of habitat types and species assemblages supported.
- 8.5.54 In respect of climate change, predicted changes to temperature and precipitation would likely change the landscape around us over time in a number of ways. However, it is unlikely that such subtle changes would lead to wholesale change to the future ecology baseline within the lifetime of the Development. Changes could see certain habitats and species becoming more prevalent or declining as their ranges contract or expand. However, given that those species identified for the Site are generally widespread, and that the Survey Boundary is not near the edge of any of their ranges, the projected change in temperature and precipitation is not anticipated to result in any significant changes to IEFs.

8.6 Embedded measures

- 8.6.1 A range of environmental measures have been embedded into the Proposed Development as outlined in **Section 4.4** and further detailed below.

Construction Environmental Management Plan

- 8.6.2 An outline Construction Environmental Management Plan (CEMP) supports this Draft Submission and will be implemented during the entirety of the construction stage to ensure appropriate management and operational systems are in place to avoid or minimise adverse pollution effects
- 8.6.3 The CEMP can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

³³ Near Threatened (NT) = Species which do not qualify for Red Data Book (RDB) categories 'Critically Endangered', 'Endangered' or 'Vulnerable' now but are close to qualifying for, or are likely to qualify for, a threatened category in the near future.

³⁴ Nationally Scarce (NS) or Notable (Na or Nb) = species which do not fall within RDB categories but which are none-the-less uncommon in Great Britain and occur within the range of 16 to 100 ten-kilometre squares of the British National Grid system since 1970.

³⁵ Nationally Local (Local) = Species which, whilst fairly common, are evidently less widespread than truly common species, but also not qualifying as 'Nationally Scarce' having been recorded from over 100, but less than 300, ten-kilometre squares of the British National Grid system since 1970.

Ecological Construction Method Statement

- 8.6.4 An Ecological Construction Method Statement (ECMS) will be prepared which will set out in detail the measures to be implemented to protect IEFs during the construction phase of the Proposed Development. It is proposed that the methodologies prescribed within the ECMS will be overseen by an appointed Ecological Clerk of Works (ECoW), whose scope and remit will be set out within the ECMS. The ECMS will also identify clearly the responsibilities of key personnel including the Site manager(s) and ECoW. This document will also cross reference with the CEMP, where relevant.
- 8.6.5 The ECMS and appointment of the ECoW can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

Landscape and Ecological Management Plan

- 8.6.6 A Landscape and Ecological Management Plan (LEMP) will be prepared to ensure the appropriate management and maintenance of all retained and newly created habitats/features proposed over the lifetime of the development. The LEMP will set out in the detail those ecological management prescriptions for defined management compartments to be retained and/or created, in addition to the monitoring of biophysical changes to sensitive habitats including: terrestrial succession and scrub encroachment within retained, enhanced and newly created habitats; botanical monitoring of sensitive habitats retained, translocated and restored; the monitoring of new habitats/features installed/created across the Site; and any additional monitoring and remedial action required.
- 8.6.7 The LEMP can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

Collision Mitigation Monitoring Strategy (CMMS)

- 8.6.8 A detailed Collision Mitigation Monitoring Strategy (CMMS) will be prepared, which will set out in detail the measures to be implemented to reduce the impacts on bats from killing due to barotrauma. The CMMS will set out the detailed mitigation measures to be employed, including feathering of the blade, curtailment for specific turbines at specific times of year (e.g., curtailment during the autumn months when there are peaks in bat activity from high collision risk species) and/or during specific weather conditions (e.g., during warm nights with little wind, which are considered favourable conditions for bats). Monitoring details will also be set out, to include the level and duration of monitoring required (such as acoustic monitoring and carcass searches). The CMMS will allow for adaptation of the mitigation strategy if the monitoring surveys find that mitigation measures are not preventing bat deaths, and will allow for additional curtailment measures to be included to prevent such fatalities.
- 8.6.9 The CMMS can be secured by way of a suitably worded pre-commencement planning conditions attached to the planning permission.
- 8.6.10 **Table 8.9** outlines how these embedded measures will influence the biodiversity assessment.

Table 8.9 Summary of the embedded environmental measures

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
Construction			
Internationally and nationally designated sites: Usk Bat Sites SAC, Siambre Ddu SSSI, and Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR)	No direct impacts on habitats given that the SAC and component SSSIs lie at least 8km north of the Site.	None required. However, construction works to be carried out during daylight hours, and/or during the winter months when bats will be in hibernation. A sensitive lighting regime can also be incorporated if works need to be carried out at night.	CEMP
Locally designated sites: Blaensychan Valley SINC (T5), Cefn y Crib SINC (T11), Graig Ddu/Gelli-Deg Wood SINC (T42), Mynydd Llanhilleth Common SINC (T55), Tirpentwys Cut SINC (B39/T92), Waun Wen & Cwmbryrgwm SINC (T108), Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35), Mount View, Blaen-y-Cwm SINC (T51), Rhiw Frank Meadows SINC (T82), Blaen-y-cwm Upland Pasture SINC (T6) and The British SINC (T91).	Impacts arising from habitat loss on SINC habitats present within the Site as a result of construction of the access route, grid connection corridor and turbines.	Habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible. Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.	ECMS/LEMP
Potential impacts on: Cwm Ddu Woods, Blaenserchan SINC (T27), Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25), Penrhiwfid Fields SINC (T68)			

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
Habitats	Direct and indirect impacts upon sensitive habitats from construction of turbine locations and associated infrastructure, including direct loss of habitat, and indirect loss arising from disturbance impacts, dust deposition, and polluted run-off.	<p>Habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible.</p> <p>Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.</p>	ECMS/LEMP
Commuting, foraging and roosting bats	Potential disturbance to foraging, commuting and roosting bats as a result of use of night-time lighting during construction works.	<p>The Site lies outside the CSZ of lesser horseshoe bat using the Usk Bat Sites SAC for roosting. No adverse impacts will therefore arise upon this SAC.</p> <p>Minimum 50m stand-off from turbine blade tip and any linear or woodland habitat. Turbines sited away from nearby roosts.</p> <p>In respect of local bat populations utilising the Site,, construction works to be carried out during daylight hours, ideally over winter when bats will be in hibernation, and/or implementation of a sensitive lighting regime should works need to be carried out at night.</p>	ECMS/CEMP
Otter	<p>Potential killing/injury of otter as a result construction activities associated with the upgrading of the main access route.</p> <p>Potential disturbance to dispersing or foraging otters from lighting at night during construction of access route.</p>	<p>Update survey of stream adjacent to access route and any other affected watercourses prior to construction.</p> <p>In unlikely event that holts are recorded, exclusion of animals from the affected area and provision of alternative habitat (under NRW EPS licence) prior to works.</p> <p>Construction activities will be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and</p>	ECMS/CEMP

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
		dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.	
Common reptiles	Potential killing/injury of common reptiles during construction phase from habitat clearance and construction traffic.	Suitable reptile habitat to be subject to a habitat manipulation exercise prior to construction works commencing. Any reptiles found to be moved to retained habitats away from the working corridors, to prevent killing or injury. The construction areas to be retained as unsuitable habitat for the duration of the construction works.	ECMS/CEMP
Invertebrates	Loss of habitat supporting 46 species of conservation importance.	Habitats that are subject to temporary loss to be reinstated at the earliest opportunity and enhanced where possible. Habitats that are permanently lost to be offset through habitat creation and enhancements to retained habitats within the wider Site.	ECMS/LEMP
Operation			
Internationally designated sites	Potential impacts on lesser horseshoe bat, a qualifying feature of the Usk Bat Sites SAC, albeit the Site lies outside of the Core Sustenance Zone (CSZ) for lesser horseshoe from the SAC/SSSIs.	The Site lies outside the CSZ of lesser horseshoe bat using this SAC for roosting. As such, there will be no adverse impacts upon the population of lesser horseshoe (a qualifying feature) within the SAC.	N/A
Locally designated sites	No additional impacts during the operational phase.	N/A	N/A
Habitats	No additional impacts during the operational phase.	N/A	N/A
Invasive species	Potential spread of non-native, invasive species including Japanese	Specialist removal and control measures to be employed during	ECMS/LEMP

Receptor	Potential changes and effects	Embedded measures	Compliance mechanism
	knotweed wall cotoneaster, Japanese rose and New Zealand willowherb during construction of the access route	construction, including removal of controlled waste to prevent spread, and an ongoing control and monitoring programme to ensure invasive species are eradicated from site.	
Commuting and foraging bats	Potential killing/injury from location of turbines within commuting and foraging routes for bats.	Minimum 50m stand-off from turbine blade tip to be maintained in respect of new tree planting. . Feathering of blades during idling. Curtailment during bat sensitive periods (e.g., at certain times of year and during good weather conditions when bats are active).	Collision Mitigation Monitoring Strategy (CMMS)
Roosting bats	Potential killing/injury from bats within nearby roosts from location of turbines within close proximity to bat roosts.	Pre-commencement checks of trees and built structures with bat potential in vicinity of turbines to confirm continued absence of roosts. Implementation of mitigation measures prior to felling of trees with confirmed bat roost potential (or in accordance with an NRW EPS licence where bat roosts are confirmed).	ECMS/LEMP/CMMS
Common reptiles and invertebrates	No additional impacts during the operational phase.	N/A	N/A

8.7 Scope of the assessment

Overview

- 8.7.1 Best practice guidelines for EclA (CIEEM 2019) recognise that not every species that is potentially present at a site or affected by a development can be assessed. The guidelines advocate that the EclA process includes an initial ‘scoping stage’ to identify ecological features that are unlikely or likely to be significantly affected by the Proposed Development, thereby allowing the assessment to focus on those ecological features that are pertinent to the Proposed Development and planning decision. This process is informed by the site investigations and consultation with key stakeholders, including the formal EIA Scoping response. This section summarises the approach to, and outcomes of, the EclA scoping stage, including those ecological (non-ornithology) features that have been scoped into or out of the assessment.

The Proposed Development

- 8.7.2 The Proposed Development is described in full in **Chapter 4 Project Description**. It comprises a wind farm consisting of up to eight wind turbines, each with a three-bladed rotor with a diameter of up to 150m, a hub height of up to 122m and maximum height to blade tip of 180m.
- 8.7.3 The application also includes associated infrastructure, including: access works - improvements to the existing access together with new and improved internal wind farm tracks off the main internal access road; crane pads at each turbine location; turbine foundations; underground power cables linking the turbines and on-site substation; temporary construction compounds, laydown and storage areas; , and grid connection infrastructure, including the on-site substation, control building and underground cables linking the Site to the distribution network, together with construction enabling works.
- 8.7.4 The wind farm will have an operational life of 30 years. For the purposes of this assessment, it is assumed that the wind farm would be decommissioned at this point, though there is also the option for the developer to apply for an extension or upgrades in technology.

Spatial scope

- 8.7.5 The spatial scope of the assessment of biodiversity covers the area of the Proposed Development contained within the red line boundary, together with the Zols that have formed the basis of the study area described in **Section 8.4**. This has been determined through a review of the baseline ecology conditions relative to the project in the context of the proposed activities. It has also been informed by liaison with consultees and other specialists involved in assessing the effects in other disciplines of the project, as considered within this ES and other supporting documentation.
- 8.7.6 The potential impacts of the Proposed Development are largely confined to the turbine locations, access route and grid connection corridor, although given the continuity of habitats outside the Site, consideration has also been given to the following effects upon habitats and species extending beyond these areas which could arise as a result of the construction of the Proposed Development, in the absence of mitigation:
- Disturbance to populations from noise, visual and human disturbance;
 - Fragmentation of dispersal corridors used by adjacent populations;
 - Direct habitat loss, damage and degradation due to land take upon habitats and species;
 - Disruption to habitats or populations within range of dust deposition;
 - Disturbance to populations within dispersal distance of the Site; and
 - Pollution to groundwater and surface water flows.
- 8.7.7 As such, the scope of the desk study and survey areas reflects the sensitivity and value of potential ecological receptors, extending to 30km and 2km from the Survey Boundary respectively. The spatial scope of the surveys was subject to small variations between the year one and year two surveys due to minor changes in the potential turbine and infrastructure locations.

Temporal scope

- 8.7.8 The temporal scope of the assessment of biodiversity is consistent with the period over which the Project would be carried out as set out in **Chapter 3**. This includes an anticipated 22-month construction period and 30 year operation. Effects during decommissioning have not been specifically assessed at this stage; however, it is considered that they will be similar or no worse than construction effects.

Construction Phase

- 8.7.9 Generalised effects which could arise as a result of the construction of the Proposed Development in the absence of mitigation include the following:
- Effects of direct habitat loss, damage and degradation due to land take upon habitats and species;
 - Impacts of noise, light and human disturbance to species; and
 - Pollution of groundwater and surface water flows, as described further in **Chapter 10: Water Environment**.

Operational Phase

- 8.7.10 Generalised effects which could arise as a result of the operation of the Proposed Development, in the absence of mitigation, include the following:
- Effects of light and noise/visual/human disturbance to habitats and species;
 - Increased risk of collision to species arising from increased traffic movements;
 - Increased levels of airborne pollutants due to dust; and
 - Alteration of surface water and groundwater flow quality and quantity **Chapter 10: Water Environment**.

Decommissioning

- 8.7.11 Generalised effects which could arise as a result of decommissioning of the Proposed Development in the absence of mitigation include the following:
- Effects of additional habitat loss, damage and degradation due to land take upon habitats and species;
 - Impacts of noise, light and human disturbance to species; and
 - Increased risk of collision to species arising from increased traffic movements.

Potential receptors

- 8.7.12 The principal ecological receptors that have been identified as being potentially subject to effects are summarised in **Table 8.10**.

Table 8.10 Ecological receptors subject to potential effects

Receptor	Reason for consideration
International Sites	
Usk Bat Sites SAC	Situated circa 8km to the north of the Site (closest section), supporting one of the largest maternity roosts of lesser horseshoe bat and a number of important hibernacula within the cave systems, supporting up to 5% of the UK population.
National Sites	
Siambre Ddu SSSI	Situated circa 8km north of the Site and comprising a component SSSI unit of the Usk Bat Sites SAC, supporting hibernating lesser horseshoe bats within its cave comprising the third largest hibernation site in Gwent for lesser horseshoe bat.
Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR)	Situated circa 9km to the north-west of the Site and comprising a component SSSI unit of the Usk Bat Sites SAC, supporting one of the five most important hibernation sites in the UK for lesser horseshoe bat.
Local Sites	
SINCs within the Site	Those SINCs situated within the Site and to be affected by construction of the turbines, access road and grid connections: Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25) Tirpentwys Cut SINC (B39/T92) Waun Wen & Cwmbryrgwm SINC (T108) Cefn y Crib SINC (T11) Cwm Ddu Woods, Blaenserchan SINC (T27) Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35) Graig Ddu/Gelli-Deg Wood SINC (T42) Blaensychan Valley SINC (T5) Mount View, Blaen-y-Cwm SINC (T51) Mynydd Llanhilleth Common SINC (T55) Blaen-y-cwm Upland Pasture SINC (T6) Penrhiwfid Fields SINC (T68) Rhiw Frank Meadows SINC (T82) The British SINC (T91)
Habitats	
Broadleaved semi-natural woodland	To be impacted by construction of the grid connection corridor and access route.
Heathland (including heathland/bracken mosaic)	Present within the grid connection corridor and access route.
Acid grassland (unimproved and semi-improved)	Present within the grid connection corridor, access route and turbine locations.
Neutral grassland (unimproved and semi-improved)	Present within the grid connection corridor, access route and turbine locations.
Aquatic features	Present within the access route.

Receptor	Reason for consideration
Marshy grassland	Present within the grid connection corridor, access route and turbine locations.
Hedgerows and tree lines	Present within the turbine locations.
Former quarry areas and associated coniferous woodland	Present within the main Site.
Improved grassland	Present within the main Site.
Amenity grassland	Present within the access route.
Scrub	Present within the grid connection corridor, access route and turbine locations.
Tall ruderal and tall herb	Present within the grid connection corridor, access route and main Site.
Hardstanding and buildings	Present within the grid connection corridor, access route and turbine locations.
Invasive plant species	Non-native and invasive species occur in association with the access road, including Japanese knotweed, wall cotoneaster, Japanese rose and New Zealand willowherb.
Protected Species	
Commuting and foraging bats	Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared bat, myotis, noctule, serotine, greater horseshoe bat and lesser horseshoe bat recorded foraging and commuting across the Site.
Roosting bats	Building B10 supports a summer day roost for low numbers of common pipistrelle bats. Numerous trees with potential to support bats also present across the Site.
Otter	Otter sprint present along the Cwmsychan Brook in association with the access route.
Common reptiles	Presence of a common reptile population assumed based on local records and habitat suitability, with incidental sightings of common lizard recorded across the Site and of slow-worm along the access route.
Invertebrates	46 species of conservation importance recorded across the Site.

Likely significant effects

- 8.7.13 The effects on ecological receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 8.11**. This has been informed by best practice guidance and professional judgement.

Table 8.11 Ecological receptors scoped in for further assessment

Receptor	Likely significant effects
International Sites	
Usk Bat Sites SAC	Potential impacts on bat populations within this SAC.
National Sites	
Siambre Ddu SSSI	Potential impacts on bat populations within this SSSI.
Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR)	Potential impacts on bat populations within this SSSI.
Local Sites	
Blaen-y-cwm Upland Pasture SINC (T6)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.
Blaensychan Valley SINC (T5)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.
Cwm Ddu Woods, Blaenserchan SINC (T27)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Cefn y Crib SINC (T11)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Graig Ddu/Gelli-Deg Wood SINC (T42)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the turbines.
Mynydd Llanhilleth Common SINC (T55)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.
Tirpentwys Cut SINC (B39/T92)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Waun Wen & Cwmbyrgwm SINC (T108)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route, turbines and grid connection connector.
Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Mount View, Blaen-y-Cwm SINC (T51)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.

Receptor	Likely significant effects
Rhiw Frank Meadows SINC (T82)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the grid connection.
The British SINC (T91)	Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.
Habitats	
Heathland (including heathland/bracken mosaic)	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route and grid connection corridor.
Acid grassland (unimproved and semi-improved)	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection corridor and turbines.
Broadleaved semi-natural woodland	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route and grid connection corridor.
Marshy grassland	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection corridor and turbines.
Hedgerows and tree lines	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the turbines.
Aquatic features	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route.
Neutral grassland (unimproved and semi-improved)	Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection corridor and turbines.
Japanese knotweed	Potential for spread of this invasive non-native species during construction works.
Protected Species	
Commuting and foraging bats	Potential for killing/injury of bats commuting and foraging within and through the Site.
Roosting bats	No trees confirmed to have roosting bats, but a number of trees with potential to support bats to be lost to facilitate turbine construction, in addition to occurring within the 130m buffer zone. Potential loss of bat roosts and killing/injury of bats if bats colonise these trees, as well as indirect effects on bats in other nearby roosts.
Otter	Potential for loss of foraging/dispersal habitat and fragmentation of habitat during construction of the access route. Potential for killing/injury of otters during construction, from an increase in vehicles on the access route.
Common reptiles	Loss of suitable habitat. Potential killing/injury during habitat clearance and construction works.
Invertebrates	Loss of habitat supporting species of conservation importance.

- 8.7.14 The receptors/effects detailed in **Table 8.12** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

Table 8.12 Summary of effects scoped out of the biodiversity assessment

Receptors/potential effects	Justification
International Sites	
Usk Bat Sites SAC	No likely significant effects given distance from the Site and nearest turbine.
National Sites	
Siambre Ddu SSSI	No likely significant effects given distance from the Site and nearest turbine.
Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR)	No likely significant effects given distance from the Site and nearest turbine.
Local Sites	
Penrhiwfid Fields SINC (T68)	No likely significant effects. Only a small area within the Site and does not lie within the access route, grid connection corridor or turbine locations.
Habitats	
Former quarry areas and associated coniferous woodland, bracken, semi-improved grassland, poor semi-improved & improved neutral grassland, scrub, tall ruderal and tall herb, amenity grassland, and hardstanding and buildings.	No likely significant effects as these habitats either do not lie within the access route, grid connection corridor or turbine locations, or loss of these habitats is of negligible significance.
Protected species	
Dormouse	Not present within the Site or surrounding area surveyed.
Great crested newt	Not present within the Site or surrounding area surveyed.
Badger	Not present within the Site or surrounding area surveyed.
Water vole	Not present within the Site or surrounding area surveyed.

8.8 Assessment methodology

Evaluation Methodology

- 8.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 2: Approach to Environmental Impact Assessment**. However, whilst this has informed the approach that has been used in this Biodiversity assessment, it is necessary to set out

how this methodology has been applied, and adapted as appropriate, to address the specific needs of this biodiversity assessment.

- 8.8.2 The evaluation of IEFs will be made with reference to the guidelines published by the CIEEM. The guidelines propose an approach to valuing ecological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered. In addition, best practice guidance in relation to survey techniques and mitigation measures will also be taken into account.

Geographical Context

- 8.8.3 The Guidelines recommend that the value or potential value of the important ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:
- International;
 - National (Wales);
 - County (Torfaen and Blaenau Gwent); and
 - Local (considered as the 2km Study Area around the Survey Boundary).
- 8.8.4 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Species

- 8.8.5 The guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, both species and habitats should be assessed according to their biodiversity value, measured against published selection criteria where available, such as those protected under the Conservation of Habitats and Species Regulations 2017 (as amended), or those listed as priority species or habitats under Section 7 of the Environment (Wales) Act 2016. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection, whilst using any relevant published evaluation criteria available at the time of assessment. Where habitats do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Characterising Potential Impacts

- 8.8.6 The guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the Development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features as well as further consider impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the ZoI during the lifetime of the Development.

- 8.8.7 When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters:
- Beneficial or adverse;
 - Extent;
 - Magnitude;
 - Duration;
 - Timing;
 - Frequency; and
 - Reversibility.

Significance Criteria

- 8.8.8 The CIEEM guidance defines an ecologically significant impact as an '*effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general*'. Once a potential significant impact is identified as likely to affect the integrity/ favourable conservation status of a potential IEF, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.
- 8.8.9 Although certain species may not constitute IEFs based upon their nature conservation value, they may still warrant consideration during the design and mitigation of the Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.
- 8.8.10 The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.
- 8.8.11 Due to the application of the CIEEM Guidelines, the impact assessment presented in this chapter differs slightly in approach to the remainder of the ES, with each IEF being assessed in terms of whether or not an impact (beneficial or adverse) is significant (assessment of impact), alongside the geographical scale at which this occurs (importance of feature). In each case, for consistency with the remainder of the ES, a conclusion is then presented as to whether or not a significant effect will occur, with such effects being described as either adverse or beneficial. No scale is ascribed to the assessment of effects (i.e., they are either significant or not significant) except in relation to the geographic context.
- 8.8.12 The significance of the potential impacts upon IEFs will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the Development. Consideration will also be given to the potential future impacts to IEFs arising as a result of global trends and climate change.
- 8.8.13 Additionally, and in accordance with Conservation of Habitats and Species Regulations 2017 (as amended), screening will also be required to determine if likely significant effects upon pertinent designated sites comprising the National Site Network (i.e., SACs and SPAs) would arise as a result of the Development and, if this is the case, for an appropriate assessment (AA) to be undertaken. Whilst the Habitats Regulations Assessment is the responsibility of the Competent Authority, information to inform this process will be prepared if required.

8.9 Assessment of Biodiversity Effects

- 8.9.1 An assessment of likely significant effects of the Proposed Development on those IEFs identified above has been undertaken based on the application plans. The quantum and layout of the Proposed Development incorporate inherent or embedded ecological mitigation as a result of an iterative assessment and design process, as set out above.
- 8.9.2 The likely effects are assessed with the inherent mitigation included, but in the absence of the additional mitigation measures required to address potentially significant effects. Anticipated effects during the construction and operation/post-completion stage of the Proposed Development are discussed in turn below.

Internationally and Nationally Designated Sites

Usk Bat Sites SAC, Siambre Ddu SSSI, and Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR)

- 8.9.3 With regards to the Usk Bat Sites SAC (as well as its constituent SSSIs) the Habitat Regulations Assessment (HRA) of the Torfaen Replacement Local Development Plan³⁶ recommends that the Local Development Plan (LDP) includes *'protective policy wording into the Deposit Plan that recognises the 2km Core Sustainance Zone (CSZ) for lesser horseshoe bats'* given that *'Scientific evidence indicates that foraging and/or commuting habitat within this buffer is essential for the integrity of the bat populations in the SAC'*. As the Site lies 8km from the SAC, and is therefore well outside the CSZ for lesser horseshoe bat, no adverse impacts are anticipated upon this SAC either alone or in combination with any other plans of projects.
- 8.9.4 However, Policy DM14 of the Local Development Plan up to 2021³⁷ states that *'development proposals within 10 km of the Usk Bat Sites Special Area of Conservation (SAC) that would have an impact on connectivity corridors or cause direct or indirect disturbance to the features must be subject to a project level Habitat Regulation Assessment (HRA)'*. The supporting text of this policy also states *'Development proposals on land which although a considerable distance away (10km), could impact upon the Usk Bat Sites SAC. A key aspect of the Lesser Horseshoe Bat is its mobility, which means that it could potentially travel many kilometres from Usk Bat Sites SAC. Therefore mitigation measures are necessary in respect of potential development in all areas with the exception of the very southern parts of the Borough. Consequently any potential development proposals that would have an impact on connectivity corridors or cause direct or indirect disturbance to the features (such as light, noise etc.) must be subject to a project level HRA'*. However, whilst the Site lies circa 8km from this SAC, the nearest turbine location lies circa 9.9km south of this SAC (Turbine 2), whilst all other turbine locations lie beyond 10km from the boundary of this SAC. As such, taking into account the findings of the Torfaen County Borough Council's HRA, and given that the CSZ for lesser horseshoe is 2km, no adverse impacts either alone or in combination with any other plans of projects upon this SAC are considered likely to arise, such that a project HRA is not deemed necessary.

³⁶Habitat Regulations Assessment of the Torfaen Replacement Local Development Plan – Preferred Strategy (draft). AECOM on behalf of Torfaen County Borough Council. Available at: <https://www.torfaen.gov.uk/en/PlanningAndDevelopment/Planningpolicy/Local-Development-Plan-Review/Replacement-Torfaen-Local-Development-Plan.aspx> accessed 15 September 2022).

³⁷Local Development Plan up to 2021. Blaenau Gwent County Borough Council. Adopted 2012.

- 8.9.5 As such, **no significant adverse** construction or operational effects upon the Usk Bat Sites SAC or its constituent SSSIs are considered likely to arise as a result of the Proposed Development.

Locally Designated Sites

SINCs within the Site

- 8.9.6 The construction of the turbines along with associated infrastructure including the grid connection corridor and access routes will result in the loss of habitats associated with the following SINCs: Blaensychan Valley SINC (T5), Blaen-y-cwm Upland Pasture SINC (T6), Cwm Ddu Woods, Cefn y Crib SINC (T11), Blaenserchan SINC (T27), Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35), Graig Ddu/Gelli-Deg Wood SINC (T42), Mount View, Blaen-y-Cwm SINC (T51), Mynydd Llanhilleth Common SINC (T55), Rhiw Frank Meadows SINC (T82), Tirpentwys Cut SINC (B39/T92), Waun Wen & Cwmybyrgwm SINC (T108), The British SINC (T91) and Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25). The locations of these SINCs are further described at **Appendix 8A**.
- 8.9.7 In respect of the main access route to the north east of the Site, junction improvements at Talywain, widening of the existing track together with required cut and fill, particularly at existing bends along this route will be required to facilitate access for construction vehicles. This will result in minor losses to those habitats bordering the existing track, including the following SINCs: The British SINC (T91), Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35), Waun Wen & Cwmybyrgwm SINC (T108), Mynydd Llanhilleth Common SINC (T55) and Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25).
- 8.9.8 Improvements to the access route between turbines, in particular the route between Turbine 4 and Turbine 8 which extends through the former quarry area, will also result in minor losses to the habitat bordering the existing track, including the following SINCs: Tirpentwys Cut SINC (B39/T92), Mynydd Llanhilleth Common SINC (T55), Cefn y Crib SINC (T11), and Blaen-y-cwm Upland Pasture SINC (T6).
- 8.9.9 Along the route of the grid connection corridor, impacts from construction activities will also result in the minor loss of habitats associated with the following SINCs: Rhiw Frank Meadows SINC (T82), Waun Wen & Cwmybyrgwm SINC (T108), and Mynydd Llanhilleth Common SINC (T55).
- 8.9.10 During construction of the turbines direct loss of habitats will also occur within SINCs associated with turbine locations 1, 2, 4, and 5, as well as loss of habitats along the access routes to these turbines. Turbines 1 and 2 will result in the minor loss of habitats within the Waun Wen & Cwmybyrgwm SINC (T108). Turbine 4 will result in the minor loss of habitats within both the Mynydd Llanhilleth Common SINC (T55) and the Blaen-y-Cwm Upland Pasture SINC (T6), and Turbine 5 will result in the minor loss of habitats within both the Blaen-y-Cwm Upland Pasture SINC (T6) and Blaensychan Valley SINC (T5).
- 8.9.11 The location of Turbines 3, 6, 7 and 8 lies outside SINC designations, although construction works to access routes to these turbine locations may also result in loss of habitats within the aforementioned SINCs.
- 8.9.12 Prior to mitigation, effects during the construction phase will be both direct and indirect, permanent and temporary, certain and probable **adverse** at the **local level** and of **minor significance**. There will be no additional effects during the operational phase.

Mitigation

- 8.9.13 Areas of marshy grassland and acid grassland subject to temporary loss during the construction of the turbines will be restored following completion. Where possible, acid and marshy grassland turves will be subject to sensitive cutting and storage during the construction period for translocation following completion of construction, reinstating turves and those plant communities established therein so as to minimise the extent of habitat loss.
- 8.9.14 Where losses are permanent, the translocation of turves otherwise lost to construction will be undertaken so as to further enhance retained areas of acid and marshy grassland subject to degradation. All areas of retained acid grassland and marshy grassland will also be subject to a sensitive management regime to further maintain and enhance its floristic diversity. Areas of encroaching scrub and bracken will be cut back to encourage grassland regeneration. Within the vicinity of turbines where any translocated turves have failed, or where areas of bare ground occur, a green hay cut will be taken from the surrounding acid/marshy grassland for spreading over the areas of bare ground to allow natural regeneration of these areas.
- 8.9.15 Where there are to be minor, temporary losses to heathland habitats, such habitats will be restored through the spreading of 'green hay' taken from adjacent heathland areas to be retained, to enable natural regeneration and establishment across impacted areas. Where permanent loss of heathland habitats cannot be avoided, habitat creation will be undertaken focusing on adjacent areas of dense scrub and bracken, with the translocation of turves otherwise lost to construction utilised to reinstate areas of heathland elsewhere, together with the use of 'green hay' to speed up establishment.
- 8.9.16 Areas of broadleaved woodland subject to temporary loss will be restored following completion of construction, through the provision of new, native tree planting utilising species of local provenance to further enhance SINC habitats. Where there is to be permanent loss of woodland area, such losses will be compensated for through the provision of new native tree planting across areas of scrub, with sensitive grassland habitats avoided.
- 8.9.17 An ECMS will be prepared which will set out in detail those measures to be implemented to protect IEFs during the construction phase of the Proposed Development. It is proposed that the implementation of the ECMS will be overseen by an appointed ECoW, whose scope and remit will be set out within the ECMS.
- 8.9.18 An outline Construction Environment Management Plan (CEMP) has been prepared and will be continually updated and implemented during the entirety of the construction stage to ensure appropriate management and operational systems are in place to avoid or minimise adverse pollution effects during construction.
- 8.9.19 A LEMP will also be prepared, which will set out in the detail those measures to be implemented to ensure the successful establishment/installation of new habitats/features and the long-term maintenance and management of the retained and enhanced habitats/features.
- 8.9.20 Post mitigation, effects will be **negligible** at the **local level** and of **minor significance**.

Habitats

- 8.9.21 The construction of Turbines 3, 4, 5 and 6 will result in the loss of areas of marshy grassland, unimproved and semi-improved acid grassland of local importance. Construction works required to upgrade existing/create additional access routes to these turbine locations will also result in loss/damage to additional areas of such habitats. There

are not considered to be any additional impacts from the construction of Turbines 1, 2, 7 and 8 given their siting within areas of improved and semi-improved grassland.

- 8.9.22 The construction of Turbine 5 will also likely result in the direct loss of hedgerow habitat and tree belts within the vicinity of the turbine footprint, whilst additional hedgerow and tree loss may also be required in respect of turbine locations 1, 2 and 6 to facilitate blade rotation.
- 8.9.23 In respect of the proposed access route, construction works necessary to upgrade the existing highway including widening and cut and fill works will result in minor losses to areas of unimproved neutral grassland, dwarf shrub heath, unimproved and semi-improved acid grassland, marshy grassland and broadleaved semi-natural woodland, with additional potential impacts upon Cwmsychan Brook. In addition, construction of the access route could also potentially result in the spread of non-native and invasive species including Japanese knotweed, wall cotoneaster, Japanese rose and New Zealand willowherb.
- 8.9.24 In respect of the grid connection corridor, construction works necessary to facilitate the undergrounding of cables will result in the minor loss of unimproved and semi-improved acid grassland, acid grassland, dwarf shrub heath, marshy grassland, and broadleaved woodland.
- 8.9.25 All other habitats within the Site will be retained and protected from construction or operational activities.
- 8.9.26 Prior to mitigation, effects during the construction phase will be direct and indirect, permanent and temporary, certain and probable **adverse** at the **local to regional level** and of **minor significance**. There will be no additional effects during the operational phase.

Mitigation

- 8.9.27 In respect of impacts upon marshy grassland, acid grassland, dwarf shrub heath and broadleaved woodland, mitigation will be delivered as per those details set out previously above in respect of locally designated sites, with details included in both ECMS and LEMP.
- 8.9.28 In respect of impacts upon hedgerows and tree belts, mitigation will include the provision of new, native hedgerow and tree planting utilising species of local provenance to further strengthen the existing hedgerow network through infill planting and habitat creation. Where hedgerow loss is unavoidable, suitable specimens will be subject to translocation elsewhere onsite to speed up establishment to further maximise hedgerow connectivity as far as possible.
- 8.9.29 In addition, the ECMS together with the CEMP will set out in detail those measures to be implemented to protect IEFs during the construction phase of the Proposed Development, with the implementation of the ECMS overseen by an appointed ECoW. The ECMS will also cross reference the CEMP, which will include additional measures to ensure appropriate management prescriptions are in place to avoid or minimise adverse pollution effects on the Cwmsychan Brook in particular. The CEMP will also ensure the appropriate control and treatment of non-native, invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), including those species classified as 'controlled waste' under the Environmental Protection Act 1990.
- 8.9.30 The LEMP will also set out in detail those measures to be implemented to ensure the successful establishment/installation of new habitats/features and the long-term maintenance and management of the retained and enhanced habitats/features.

8.9.31 Post mitigation, effects will be **negligible** at the **local level** and of **minor significance**.

Protected Species

Bats

Trees/roosts

- 8.9.32 No evidence of roosting bats was identified for those trees occurring within the vicinity of the turbine locations when subject to detailed assessment. A total of 22 trees were confirmed as having high potential to support roosting bats however, with 54 trees assessed as having moderate potential and 49 trees with low potential. In respect of mature and semi-mature trees occurring in the vicinity of the main access route, these are considered to have only low to negligible potential to support suitable roost features for bats. Mature and semi-mature trees occurring at the south-easternmost end of the proposed grid connection corridor route are also considered to have potential to support roosting bats.
- 8.9.33 With respect to bat roosts supported by built structures, only building B10 was confirmed to support a bat roost, with low numbers of common pipistrelle bats confirmed present. Bat roosts are otherwise presumed absent for all other built structures occurring onsite.

Foraging/commuting

- 8.9.34 A total of nine bat species/species groups were recorded foraging and/or commuting across the Site between May and October 2020 and May and October 2021, including the following species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared bat, Myotis bat species, noctule, serotine, greater horseshoe bat and lesser horseshoe bat.
- 8.9.35 During both 2020 and 2021, the vast majority of registrations recorded by the automated detectors relate to common pipistrelle (93%), which was similarly the case in respect of the walked transect surveys. Myotis bat species, soprano pipistrelle and noctule otherwise dominated the remainder of the bat activity recorded during 2020, with Myotis bat species, soprano pipistrelle and lesser horseshoe bat dominating the remainder of the bat activity recorded during 2021. Registrations for long-eared bat, serotine, greater horseshoe bat and Nathusius' pipistrelle were otherwise infrequently recorded throughout the 2020 and 2021 survey period.
- 8.9.36 The Ecobat assessment has concluded that there are five detector locations that have high levels of bat activity as well as also having an overall collision risk assessment of 'high', these being detector locations L01, L03, L04, L06 and L10. Location L01 lies near to Turbine 2, L03 and L04 lie nearest to Turbine 3 (although L04 lies 280m from any turbine location), and L06 lies near to Turbine 5. Location L10 lies further than 280m from any turbine location, although lies between Turbines 4 and 5.
- 8.9.37 In addition, those species with a high vulnerability to collision (serotine, noctule and Nathusius' pipistrelle) were recorded as having the highest levels of activity across the Site during August and September. Bat species considered to have a moderate vulnerability to collision (common pipistrelle, soprano pipistrelle, *Myotis* sp. and greater horseshoe bat) were recorded as having the highest levels of activity in August and September for greater horseshoe bat, August to October for *Myotis* sp., August for soprano pipistrelle, and June/July and September/October for common pipistrelle. The greatest level of impact upon bats will therefore likely occur between August and October.

- 8.9.38 Best practice guidance³⁸ recommends that all turbines are located at least 50m between the turbine blade tip (150m diameter, 75m radius) and the nearest woodland. This would mean the turbines should be placed at least 125m from any woodland. This guidance also sets out a calculation to determine the distance the centre of a turbine should be from vegetation, which is calculated using the following equation: $b = \sqrt{(50+bl)^2 - (hh-fh)^2}$; whereby b equates to the distance between the edge of the feature and centre of the tower, bl is blade length, hh is the hub height, and fh is the feature height (vegetation height). Assuming a blade length of 75m and a hub height of 122m, together with the vegetation height of a mature beech tree being circa 40m, the distance the turbines should be from vegetation is calculated as: $\sqrt{(50+75)^2 - (122-40)^2} = 94.3\text{m}$.
- 8.9.39 The majority of the turbine locations lie more than 125m from any woodland. However Turbine 1, 2, 5 and 6 lie within 94m of vegetation, as follows: Turbine 1 situated around 75m north of a tree belt ; Turbine 2 situated around 65m south (and 105m north) of tree belts; Turbine 5 lies around 90m west (as well as 95m south and 105m east) of a series of woodland blocks, and is also situated within an existing tree belt connected to these woodland parcels; and Turbine 6 lies around 90m west of a woodland block.
- 8.9.40 Whilst Turbine 8 lies around 120m south of the large coniferous plantation woodland associated with the central quarry area, this woodland block has been subject to commercial felling since November 2020, such that little woodland remains within proximity to this turbine at the time of writing.
- 8.9.41 Overall therefore, impacts arising upon bats will be greatest in respect of Turbine 2, 3 and 5 when taking into account the findings of the Ecobat (collision risk) assessment. Consideration should also be given to Turbines 1 and 6 when also taking into account distance from vegetation with bat roost potential.

Potential effects

- 8.9.42 The iterative design process has resulted in a reduction in the number of turbines proposed across the Site, from 12 to 8, which will ensure a reduction in the overall impact upon the local bat population.
- 8.9.43 Impacts upon bats will arise during the construction phase however, given the required loss of trees with potential to support roosting bats, resulting in a reduction in potential foraging habitat and disturbance to flight lines as a result of loss to tree belts, hedgerows and tree standards. Disturbance impacts through use of temporary lighting during construction works may also arise.
- 8.9.44 Impacts during the operational phase include the potential killing/injury of bats due to barotrauma when flying in close proximity to the turbines, including bats roosting within or nearby to the Site and those migrating through the Site, particularly during the late summer and autumn months (i.e., August - October).
- 8.9.45 Impacts will be greatest upon serotine, noctule and Nathusius' pipistrelle, these species being classed as high vulnerability species confirmed to utilise the Site, with greatest impacts likely arising from Turbines 2, 3, 4 and 5 (i.e. those situated near to detector locations L01, L03, L04, L06 and L10 where high levels of bat activity was recorded). However, Turbine 4 does lie beyond 280m from any detector location as well as being sited well away from any potential roost features or suitable foraging/commuting habitat. Turbine 3 also lies away from any potential roost features or suitable foraging/commuting habitat; however, this turbine does lie near to trees and the woodland edge, with

³⁸NatureScot (2019) Bats and Onshore Wind turbines – Survey, Assessment and Mitigation (<https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation>; last accessed 29 September 2022).

connectivity to the wider landscape. Additionally, Turbine 1 is considered to pose a moderate risk given its location near to potential roost sites and tree belts which are connected to the wider landscape. As such, impacts to bats will be highest in respect of turbine locations 1, 2, 5 and 6.

- 8.9.46 Prior to mitigation, effects during the construction phase will be certain, direct, permanent, **adverse** at the **local** level and of **moderate** significance. Prior to mitigation, effects during the operational stage will be certain, direct, permanent, **adverse** at the **local** level and of **moderate-major** significance.

Mitigation

Construction Phase

- 8.9.47 Construction activities will be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.
- 8.9.48 Prior to the removal of any trees within hedgerows, tree lines and woodland edges to facilitate construction of the turbines and associated infrastructure, update inspections of all trees to be impacted where previously confirmed to support potential roost features for bats will be undertaken prior to commencement of any tree works.
- 8.9.49 Where a bat tree roost is subsequently confirmed, an EPS licence from NRW will be required to derogate from the legal protection afforded to bats. To obtain a licence, it must be demonstrated that there will be no detriment to the maintenance of the favourable conservation status of the local bat population, with the loss of any confirmed roosts compensated for through the provision of new roosting habitat (e.g., bat boxes installed upon trees situated at least 200m away from the turbine locations).
- 8.9.50 Protection of species during construction will be ensured through implementation of the ECMS. As a general measure aimed at protecting species, "tool box talks" will be provided by suitably qualified ecologists to the principal contractor appointed by the Developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species, their habitats is understood.
- 8.9.51 A CEMP will also be prepared and implemented during the entirety of the construction stage to ensure appropriate management prescriptions are in place, including the implementation of restricted working hours so as to avoid or minimise adverse lighting effects.

Operational Phase

- 8.9.52 When the turbines are idling, the blades will be prevented from turning at low wind speeds, referred to as 'feathering'. The implementation of feathering has been shown to reduce fatality rates during idling times by 50%, with no resultant loss in output. Feathering will be included as an automated response as part of a Supervisory Control and Data Acquisitions (SCADA) system. This would either involve locking or angling the blades such that they are parallel to wind direction.
- 8.9.53 In combination with feathering of the blades, the turbines will also be curtailed to raise the cut-in speed at which the turbine blades move and begin to generate electricity. Bats are known to fly when wind speeds are low; as such, curtailing turbine activity at low wind speeds will reduce the risk of bats being killed or injured by the turbines. Wind speed

thresholds should be site-specific, but in general, curtailment should occur at wind speeds below 6.5 metres per second (m/s).

- 8.9.54 Timing of operation could also be curtailed during times when those bat species with a high vulnerability to collision risk (serotine, noctule and Nathusius' pipistrelle) are present, i.e. between August and October.
- 8.9.55 The SCADA system can also be programmed to curtail specific turbines once temperatures rise above a certain temperature during this period, as well as a certain windspeed. During the months of August to October, the minimum temperature bat activity across the Site was recorded at was 7.6°C (October). Below 7°C there is little insect prey available for bats to hunt; whilst bats are known to fly occasionally during low temperatures, the chances of bats foraging in temperatures below 7°C is considered to be low. It should, however, be noted that during May temperatures dropped to around 2°C, with bat activity still recorded. However, during May only very low levels of bat activity was recorded for those species considered to have moderate or high collision risk.
- 8.9.56 The SCADA system could also be linked to a continual acoustic monitoring system, installed at the turbine nacelle, which records bat registrations to enable real-time analysis of the data received. This would allow the acoustic monitoring system to require the curtailment of the turbine as soon as bats are recorded near to the turbine, with curtailment possible as a response to any bat species or specific bat species which are considered to be at higher risk of collision. This would reduce bat fatalities as well as reducing costs associated with blanket curtailment of all turbines across the Site when bats may otherwise not be present.
- 8.9.57 The following factors should be programmed into a SCADA curtailment system: wind speed in m/s (measured at the nacelle height); time after sunset; month of the year; temperature (°C); and precipitation (mm/hr).
- 8.9.58 Post-construction monitoring will also be carried out to assess the effectiveness of the above feathering and curtailment measures, to inform any additional mitigation that may be required. Such monitoring will comprise the passive monitoring of bat activity as well as active searching for bat carcasses beneath turbines.
- 8.9.59 Acoustic monitoring would determine whether there has been any reduction in bat activity at the Site following construction of the turbines, in which case the level of curtailment could potentially be reduced, or indeed whether there has been an increase in bat activity as a result of bats being attracted to surrounding habitats or the turbines themselves. Should there be an increase in bat usage of the Site following construction of the turbines, the level of curtailment may need to be increased to prevent increased levels of killing and/or injury. Such monitoring would include the positioning of automated bat detectors at both the original survey locations, to allow direct comparison of bat activity across monitoring periods, as well as within the turbine nacelles themselves, to allow for an assessment at the exact turbine location and at the height of the impact, which may include detection of additional bats at height otherwise not detectable during the initial surveys (which were carried out at ground-level).
- 8.9.60 Carcass searching will also be employed beneath the turbines. This will involve a systematic search of the ground beneath the turbine blades for the presence of bat carcasses (by hand and/or employment of a trained sniffer dog). Should an increase in bat carcasses be recorded during the year, additional mitigation measures will be employed, such as further curtailment of the turbines during these months or during those weather conditions.
- 8.9.61 The details of this mitigation and monitoring strategy will be set out in a CMMS, which can be secured by way of a suitably worded pre-commencement planning condition attached to the planning permission.

8.9.62 Post mitigation, effects will be **negligible** at the **local level**.

Otter

- 8.9.63 An otter spraint was recorded upon a large boulder located alongside Cwmsychan Brook immediately downstream of the road bridge to the east of the redundant colliery buildings at the British. This stream is considered to offer suitable foraging and dispersal habitat for otter, with no suitable breeding or resting places otherwise identified.
- 8.9.64 Likely impacts arising upon this species during the construction phase include habitat loss required to facilitate widening and cut and fill works to the existing highway as part of the access route construction works. Such works could result in the severance of the riparian corridor and associated habitats at this location. Disturbance impacts upon dispersing and foraging otter could therefore arise, particularly should direct impacts to the brook corridor be required.
- 8.9.65 During construction activities, there will be an increase in construction traffic using the track over the brook, which could result in the killing/injury of otter where a suitable alternative otter dispersal route is not otherwise available.
- 8.9.66 Prior to mitigation, impacts will be direct and indirect, permanent and temporary, probable **adverse** at the **local level** and of **minor to moderate significance**. There will be no additional effects during the operational phase.

Mitigation

- 8.9.67 Construction activities will be restricted to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided during the hours between dusk and dawn, and with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.
- 8.9.68 An update otter survey of Cwmsychan Brook will be undertaken prior to commencement of any construction activities. In the unlikely event that otter holts are recorded, otter will be excluded from the affected area during the works with suitable mitigation measures implemented (under an NRW EPS licence) prior to works.
- 8.9.69 Details of these provisions will be set out in detail in the ECMS and referred to in the CEMP.
- 8.9.70 Post mitigation, impacts will be **negligible** at the **local level**.

Reptiles

- 8.9.71 The vast majority of habitats occurring onsite considered suitable to support a common reptile population will be retained and buffered from the development footprint. Nevertheless, construction impacts will result in minor losses. The common reptile population present onsite is assessed as being of less than Local ecological importance however, such that permanent habitat losses are not significant in EIA terms.
- 8.9.72 Nevertheless, the clearance of suitable reptile habitat during construction works, in addition to other impacts arising such as an increase in construction traffic, could result in the killing or injury of common reptiles. Such actions would constitute an offence under the Wildlife and Countryside Act 1981 (as amended), compliance with which is assumed as being inherent to the Proposed Development.

- 8.9.73 Prior to mitigation, effects during the construction phase are direct, temporary and probable **adverse** at a **local level** and are of **minor significance**. There will be no additional effects during the operational phase.

Mitigation

- 8.9.74 During vegetation clearance, a habitat manipulation exercise will be carried out to ensure any reptiles found are moved to retained habitats away from the construction zone, to avoid injuring or killing of any reptiles. This will involve a sensitive, two-stage clearance of vegetation suitable for common reptiles, under supervision of an ECoW, with individuals allowed to disperse naturally, or captured by hand and relocated outside of the construction footprint.
- 8.9.75 The construction footprint will then be retained as unsuitable reptile habitat (bare ground) during the construction period to deter reptiles from recolonising these habitats until the construction works have been completed. Details of this habitat manipulation exercise will be set out in detail in the ECMS.
- 8.9.76 Post mitigation, effects will be **negligible** at the **local level**.

Invertebrates

- 8.9.77 46 invertebrate species of conservation importance have been recorded across the Site, the vast majority of which occur within grassland habitats including acid and marshy grassland. Whilst such habitats will be subject to temporary and permanent loss as a result of the Proposed Development, the extent of losses required to facilitate the construction of the turbines and associated infrastructure is considered to be limited relative to the quantum of such habitats to be retained.
- 8.9.78 Prior to mitigation, effects are direct, permanent and temporary, probable **adverse** at a **local level** and of **minor significance**. There will be no additional effects during the operational phase.

Mitigation

- 8.9.79 The restoration and enhancement of the acid grassland, marshy grassland, heathland, hedgerows, trees belts and broadleaved woodland habitats, as previously set out above in relation to locally designated sites and habitats, will ensure the retention of sufficient habitat types necessary to maintain invertebrate populations including species of conservation importance recorded for the Site.
- 8.9.80 Post mitigation, effects will be **negligible** at the **local level**.

8.10 Assessment of cumulative (inter-project) effects

- 8.10.1 A Cumulative Effects Assessment (CEA) will be undertaken for the Project which considers the combined impacts with other developments on the same single receptor or resource (inter-project effects). The detailed method followed in identifying and assessing potential cumulative effects is set out in **Chapter 4**.
- 8.10.2 The schemes to be considered in the cumulative assessment include the Proposed Development along with other existing and committed developments (i.e., those that have not been commenced but have a valid planning permission and those schemes which are in the planning process). The assessment of cumulative effects repeats the assessment process set out above, but considers the potential change caused by all schemes identified for cumulative assessment.

- 8.10.3 The assessment area for cumulative effects has been calculated based on the Core Sustainment Zones (CSZ) (as set out in Table 3.5 of the BCT Guidelines 2016³⁹) of those bats present within the Site. The CSZ range between 1-4km and as such, bats roosting within 4km of the Proposed Development as well as within 4km of other wind turbine sites could be affected by the Proposed Development. Cumulative effects are therefore assessed for those developments within 8km of the Site's boundary.
- 8.10.4 The schemes listed in **Table 8.13** below have been included within the assessment of cumulative effects due to proximity to the Proposed Development.

Table 8.13 Sites included within the cumulative effects analysis

Site name	Local Authority	Number of turbines	Height to blade tip (m)	Approximate distance from boundary of Proposed Development	Consent status
Coed y Gilfach Farm	Blaenau Gwent	2	45	1km	Operational
Abertillery	Blaenau Gwent	7	180	1.7km	Scoping
Trecelyn	Caerphilly County	5	145	2.5km	Scoping
Mynydd Carn-y-Cefn	Blaenau Gwent	8	180	2.5km	Planning
Myndd Maen	Caerphilly County	15	150m	3km	Scoping
Pen-Y-Fan Industrial Estate	Caerphilly County	1	124	5.3km	Operational
Pen-Y-Fan Ganol Farm	Caerphilly County	1	74	5.3km	Operational
Oakdale Business Park	Caerphilly County	2	130	5.4km	Operational
Manmoel	Blaenau Gwent	5	180	6km	Scoping
Blaentillery Farm	Blaenau Gwent	2	45	6.2km	Operational
Cruglwyn	Caerphilly County	1	86	8.4km	Operational
Gelli-wen Farm	Caerphilly County	1	77	8.6km	Operational
Penrhiwgwaith Farm	Blaenau Gwent	1	87	10km	Operational

³⁹Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice guidelines (3rd edn). The Bat Conservation Trust, London.

Site name	Local Authority	Number of turbines	Height to blade tip (m)	Approximate distance from boundary of Proposed Development	Consent status
Bedlwyn Farm	Caerphilly County	1	86	10km	Operational

- 8.10.5 As can be seen from the above table, Penrhiwgwaith Farm and Bedlwyn Farm both lie over 10km from the Proposed Development, No adverse impacts from these two turbines are therefore anticipated.
- 8.10.6 Those wind farms likely to have the greatest cumulative effects are those that lie within 4km of the Proposed Development, these being: Coed y Gilfach Farm (2 turbines); Abertillery (7 turbines); Trecelyn (5 turbines); Mynydd Carn-y-Cefn (8 turbines); and Mynydd Maen (15 turbines); which range in height from 45m (Coed y Gilfach Farm) to 180m.
- 8.10.7 Direct comparison between these sites is not possible, given the scale of the projects and the survey techniques used. However, where bat surveys and reports have been produced, these generally conclude that levels of bat activity are generally low, with the majority of bat activity recorded from common pipistrelle.
- 8.10.8 The cumulative effects of these wind farm developments will likely result in an increase in bat fatalities from barotrauma and loss of foraging and commuting habitat as a result of direct habitat loss arising following construction of the turbines. However, given that the levels of bat activity are generally low within these nearby sites, and that they are positioned away from bat foraging and commuting habitat across more exposed areas where bats are less likely to traverse, there are not considered to be any significant adverse effects on local bat populations.
- 8.10.9 Subject to the implementation of the proposed ecological avoidance, mitigation and enhancement measures, the residual effects of the Proposed Development alone will be negligible. Thus, the likelihood of cumulative effects on ecological features arising in combination with the schemes listed above is judged to be negligible.

8.11 Significance conclusions

- 8.11.1 A summary of the results of the biodiversity assessment is provided in **Table 8.14**.

Table 8.14 Summary of significance of effects

Receptor and summary of predicted effects	Sensitivity/importance/value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
Usk Bat Sites SAC Potential impacts on bat populations within this SAC	International	Negligible	Not significant	Site lies beyond the CSZ for lesser horseshoes and turbine locations are sited beyond the distance an HRA would be required. No significant adverse impacts are anticipated.
Siambre Ddu SSSI Potential impacts on bat populations within this SSSI	National	Negligible	Not significant	Site lies beyond the CSZ for lesser horseshoes and turbine locations lie beyond the distance an HRA would be required. No significant adverse impacts are anticipated.
Mynydd Llangattock SSSI (encompassing Craig Y Cilau NNR) Potential impacts on bat populations within this SSSI	National	Negligible	Not significant	Site lies beyond the CSZ for lesser horseshoes and turbine locations lie beyond the distance an HRA would be required. No significant adverse impacts are anticipated.
Blaen-y-cwm Upland Pasture SINC (T6) Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.
Blaensychan Valley SINC (T5)	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.

⁴⁰The importance of the receptor is defined on a geographic scale with reference to CIEEM Guidelines 2018 as set out in Section 8.8.

⁴¹Impacts have been characterised with reference to CIEEM Guidelines (2018) with due consideration to whether they are beneficial or adverse; extent; magnitude; duration; timing; frequency; and reversibility.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.				
Cwm Ddu Woods, Blaenserchan SINC (T27)	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.				
Cefn y Crib SINC (T11)	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.				
Graig Ddu/Gelli-Deg Wood SINC (T42)	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.
Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the turbines.				
Mynydd Llanhilleth Common SINC (T55)	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
<p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route and turbines.</p>				
<p>Tirpentwys Cut SINC (B39/T92)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.</p>	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
<p>Waun Wen & Cwmybyrgwm SINC (T108)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route, turbines and grid connector.</p>				
<p>Mulfran, Mynydd Coity, Mynydd James & Gwastad SINC (B25)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.</p>	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
<p>Disused Quarry colonised by acidic grassland and dry acidic heath SINC (T35)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.</p>	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
<p>Mount View, Blaen-y-Cwm SINC (T51)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.</p>	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
<p>Rhiw Frank Meadows SINC (T82)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the grid connection.</p>	Local	Low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss. However, impacts will cover a relatively large part of this SINC.
<p>The British SINC (T91)</p> <p>Potential impacts from land-take causing temporary and permanent damage/loss to habitats within the SINC from construction of the access route.</p>	Local	Very low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
Heathland (including heathland/bracken mosaic) Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route and grid connection.	Regional	Low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Enhancements to retained habitats would offset this loss.
Acid grassland (unimproved and semi-improved) Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection and turbines.	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.
Broadleaved semi-natural woodland Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route and grid connection.	Local	Low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Creation of new habitat and enhancements to retained habitat would offset this loss.
Marshy grassland Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection and turbines.	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
Hedgerows and tree lines Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the turbines.	Local	Low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Creation of new habitat and enhancements to retained habitat would offset this loss.
Aquatic features Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route.	Local	Low	Not significant	Minor temporary and permanent land take from the access route and grid connection corridor. Creation of new habitat and enhancements to retained habitat would offset this loss.
Neutral grassland (unimproved and semi-improved) Potential impacts from land-take causing temporary and permanent damage/loss to this habitat from construction of the access route, grid connection and turbines.	Local	Low	Not significant	Minor temporary and permanent land take from turbine footings. Enhancements to retained habitats would offset this loss.
Invasive plant species Potential for spread of this invasive non-native species during construction works.	Local	Low	Not significant	Specialist control measures and removal of invasive, non-native species from the Site.
Commuting and foraging bats Potential for killing/injury of bats commuting and foraging within and through the Site.	Local	Low	Not significant	CMMS including feathering of blades and curtailment of turbines, along with monitoring of effectiveness, will prevent fatalities and prevent significant adverse impacts on local bat populations.

Receptor and summary of predicted effects	Sensitivity/ importance/ value of receptor ⁴⁰	Magnitude of change ⁴¹	Significance	Summary rationale
Roosting bats No trees confirmed to have roosting bats, but a number of trees with potential to support bats to be lost within the location and 130m buffer zones. Potential loss of bat roosts and killing/injury of bats if bats colonise these trees, as well as indirect effects on bats in other nearby roosts.	Local	Low	Not significant	No bat tree roosts confirmed; trees to be subject to an update inspection prior to felling. CMMS including feathering of blades and curtailment of turbines, along with monitoring of effectiveness, will prevent fatalities and prevent significant adverse impacts on local bat populations, including the confirmed common pipistrelle roost supported by B10.
Otter Potential for loss of foraging/dispersal habitat and fragmentation of habitat during construction of the access route. Potential for killing/injury of otters during construction, from an increase in vehicles on the access route.	Local	Low	Not significant	Pre-commencement survey for otter to ensure no holts are affected. Protection of brook to ensure continued foraging and dispersal opportunities for otter.
Common reptiles Loss of suitable habitat. Potential killing/injury during habitat clearance and construction works	Local	Low	Not significant	Habitat manipulation during vegetation clearance to prevent killing/injury of reptiles.
Invertebrates Loss of habitat supporting species of conservation importance	County	Low	Not significant	Enhancements to retained habitats to offset losses.

8.12 Additional measures

- 8.12.1 The CMMS will allow for the mitigation measures (e.g. curtailment) to be adapted as monitoring surveys are undertaken. If the original mitigation measures are found to not be as effective as anticipated, the CMMS allows for additional mitigation measures to be employed (e.g. additional curtailment at different times of year or during a wider range of weather conditions). As such, no additional measures are deemed required.

8.13 Residual effects assessment

- 8.13.1 Following compliance with the CMMS and adaptation to include additional curtailment of the turbines, the risk of killing bats will be reduced.

8.14 Further work to be undertaken

- 8.14.1 The information provided in this Draft ES is preliminary, the final assessment of likely significant effects will be reported in the ES. This section describes the further work to be undertaken to support the biodiversity assessment presented in the ES.

Baseline

- 8.14.2 Further bat tree inspections will be undertaken prior to any tree works required to any trees confirmed to have bat roost potential. Update bat tree inspections will be completed to reconfirm their potential to support roosting bats as well as determining the presence/likely absence of any bat roosts which may have established during the interim period, to determine the need for an EPS licence from NRW prior to commencement of works in respect of turbine construction.
- 8.14.3 Pre-commencement surveys for otter will be necessary in respect of the Cwmsychan Brook which traverses the main access route. Surveys will search for the presence of any otter holts, to determine the need for an EPS licence from NRW prior to commencement of works in respect of the main access route.

Assessment

- 8.14.4 As part of the CMMS, the impacts of the turbines on bats and the effectiveness of the feathering and curtailment measures will be continually assessed, with additional mitigation measures included if deemed appropriate. This will serve to prevent killing of bats due to barotrauma from the turbines.

Environmental measures

- 8.14.5 As set out above, continual monitoring as part of the CMMS will inform any further mitigation that may be required during the operational phase.