



Pennant Walters
Rhyswg Wind Farm

Environmental Impact Assessment: Scoping Report

November 2025





Pennant Walters

RHYSWG WIND FARM

Environmental Impact Assessment: Scoping Report

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1 INTRODUCTION

1.1 OVERVIEW OF THE PROPOSED DEVELOPMENT

- 1.1.1. Pennant Walters Ltd. is seeking planning permission for the construction and operation of a wind farm of up to four turbines on land at Rhyswg Farm ('the Site'). The turbines are anticipated to have a height to blade tip up to 180m.
- 1.1.2. Rhyswg Wind Farm ('the Proposed Development') consists of the following elements:
- Up to four wind turbines;
 - Substation and transformer housing;
 - Temporary construction compound;
 - Temporary site offices;
 - Craine pads and cabling; and
 - Access track construction.
- 1.1.3. The Proposed Development is located within a Pre-Assessed Area (PAA) for Wind Energy as defined in the National Development Framework (NDF) – Future Wales: The National Plan 2040 (PAA 10) although the very southern portion of the Site lies outside the PAA.
- 1.1.4. Under the *Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016*, the Proposed Development meets the thresholds to qualify as a Development of National Significance (DNS). As of 2019, the DNS threshold regarding generating stations comprises all energy generation projects over 10MW. With a minimum proposed capacity of approximately 20MW, the Proposed Development meets this threshold. The *infrastructure (Wales) Act 2024* changes the consenting approach for large infrastructure in Wales. However, at this stage, and pending implementing regulations, the Proposed Development is being scoped as a DNS.
- 1.1.5. Access to the site is likely to be taken from the neighbouring RES site at Mynydd Maen – a development that currently proposes 13 wind turbines (Reference: DNS/327/6725) and Trecelyn Wind Farm (Reference: DNS CAS-02114-J9X4S6) – a development (also being proposed by the Applicant) for up to four wind turbines. At this stage, an access route to join the adopted road on which the proposed Trecelyn Wind Farm is located is identified.
- 1.1.6. Discussions with National Grid Electricity Distribution indicate that the most likely grid connection will be at 33kV depending upon the final design chosen. The connection between the on-site substation and the electricity grid located within the Trecelyn Wind Farm site location will be the subject of a separate consenting process under Section 37 of the Electricity Act 1989.
- 1.1.7. The site location is shown at **Figure 1.1**.

1.2 THE APPLICANT AND THE PROJECT TEAM

- 1.2.1. This Scoping Report has been prepared on behalf of Pennant Walters Ltd. (hereafter referred to as 'the Applicant') by WSP UK Ltd (hereafter referred to as 'WSP') (with input on biodiversity and ornithological topics provided by Environmental Dimension Partnership Ltd (EDP)).
- 1.2.2. Pennant Walters is a Walters Group company with a focus on renewable energy having obtained consent for and/or developed a wide variety of schemes including onshore wind, solar, small-scale hydro and battery storage.

1.2.3. WSP UK is registered with the Institute of Environmental Management and Assessment (IEMA)'s EIA Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in its EIA activities and have this commitment independently reviewed.

1.3 PURPOSE OF THE SCOPING REPORT

1.3.1. This Scoping Report has been prepared as part of an EIA relating to the Proposed Development. An EIA is required because the Applicant considers that the Proposed Development meets the criteria for EIA development under *The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (No.567 (W.136))* (hereafter referred to as the 'EIA Regulations').

1.3.2. The Proposed Development requires an EIA because the Applicant recognises the potential significant environmental effects of a development of this scale and it exceeds the thresholds within Schedule 2 Part 3 (Energy industry) (I) Installations for the harnessing of wind power for energy production (wind farms) of the EIA Regulations. This is because the development involves the installation of more than 2 turbines and the hub height of any turbine or height of any other structure exceeds 15 metres (m).

1.3.3. This Scoping Report supports a request for a Scoping Direction to Planning and Environment Decisions Wales (PEDW) under Regulation 33 of the EIA Regulations in respect of applications for planning permission to Welsh Ministers as a DNS project.

1.3.4. Regulation 33 (2) instructs that a request for a Scoping Direction should include:

- a) a plan sufficient to identify the land;
- b) a brief description of the nature and purpose of the development including its location and technical capacity;
- c) its likely significant effects on the environment;
- d) a statement that the request is made in relation to a development of national significance for the purposes of section 62D of the 1990 Act; and
- e) such other information or representations as the person making the request may wish to provide or make.

1.3.5. The purpose of this Scoping Report is to inform PEDW and statutory consultees on relevant aspects of the proposal prior to the formulation of a formal Scoping Direction. There is no obligation to request a Scoping Direction, however the Applicant has opted to conduct such an exercise in order to ensure that the public are aware of and engaged on the project, and to provide for the accuracy of the EIA in assessing those effects that have the potential to be significant.

1.3.6. Regard has been made to Appendix 3: Environmental Impact Assessment of The Planning Inspectorate's procedural guidance for DNS projects (Developments of National Significance, Procedural Guidance version 2.2 October 2019), which advises in more detail on information to inform a scoping request. It recommends that the Scoping Report should contain all information required by the 2017 EIA Regulations, plus the following additional information:

- *an outline of the main alternatives considered and the reasons for selecting a preferred option;*
- *results of desktop and baseline studies where available;*
- *a record of consultation undertaken with relevant bodies (including any public engagement) to date;*

- *referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal;*
- *guidance and best practice to be relied upon, and whether this has been agreed with the relevant bodies (for example the statutory nature conservation bodies or local authorities) together with copies of correspondence to support these agreements;*
- *methods used or proposed to be used to assess impacts and the significance criteria framework used;*
- *any mitigation proposed and the extent to which these are likely to reduce impacts;*
- *where impacts from consequential or cumulative development have been identified, how applicants intend to assess these impacts in the ES;*
- *an indication of any European designated nature conservation sites that are likely to be significantly affected by the proposed development and the nature of the likely significant impacts on these sites;*
- *key topics covered as part of applicants' scoping exercise; and*
- *an outline of the structure of the proposed ES.*

1.3.7. Proposals for the site include up to four turbines – the location of which will be considered through the technical and environmental survey work that is taking place and will continue to be undertaken to inform a draft layout that will be subject to further comment and feedback. Several minor iterative alterations to the design and layout of the proposed wind farm are likely to be considered before finalisation for inclusion in the application documentation as a result of the collation of environmental survey information, sensitivity analyses and consultation feedback. In this light, it is requested that PEDW acknowledges in issuing its Scoping Direction that the potential development submitted at Scoping is likely to change but that the Direction will remain valid unless there are radical alterations (i.e., significant increase in turbine numbers or heights) to the Proposed Development that would warrant a further Scoping exercise.

1.3.8. The Scoping Direction to be provided by PEDW will be used to inform the scope and focus of the Environmental Impact Assessment for this proposed DNS.

1.4 STRUCTURE OF THE SCOPING REPORT

1.4.1. The remainder of this Scoping Report is structured as follows:

- Chapter 2: The proposed development – provides a description of the development site and the Proposed Development as it has been considered within this Scoping Report;
- Chapter 3: Legislation and planning policy overview – provides an overview of the legislative and planning policy framework in relation to the development site and Proposed Development;
- Chapter 4: The Environmental Impact Assessment process – explains the approach that has been taken to identify the scope of the EIA and how the EIA will proceed;
- Chapters 5: Sets out the proposed scope and methodology for each technical topic where a significant environmental effect is likely to arise as a result of the Proposed Development;
- Chapter 6: Summary of scope – identifies those effects that are scoped out of the EIA and sets out the proposed content of the Environmental Statement.

1.4.2. This Scoping Report also contains a number of appendices which are referenced throughout the document.

1.4.3. All figures can be found at the end of the report.

2 THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

2.1.1. This section provides a brief description of the nature and purpose of the Proposed Development, including its location and potential technical capacity. These details form the basis for the assessment of likely significant effects upon the baseline situation.

2.2 THE DEVELOPMENT SITE

SITE LOCATION

- 2.2.1. The Proposed Development will take place over two parcels of land comprised of a mix of semi-improved and unimproved grassland. The location of the two parcels of land is identified below:
- Eastern Parcel – Grid Reference ST 23536 94765
 - Western Parcel – Grid Reference ST 22272 94403
- 2.2.2. The scoping Site lies within the Caerphilly County Borough Council (Caerphilly CBC) administrative area. The proposed access route includes ~1km of land within the Torfaen County Borough Council (Torfaen CBC) area but no turbine development would be proposed in this area.
- 2.2.3. The outskirts of Abercarn are located approximately 300m to the west of the Western Parcel of the site. The settlement of Cwmcarn lies approximately 400m to the south of the Western Parcel. The outskirts of Newbridge lie approximately 2km to the north west of the site. Crosskeys is around 2km to the south. The eastern boundary of the Eastern Parcel borders Ebbw Forest whilst Cwmcarn Forest lies to the south. Cwmcarn Forest includes (amongst other things) a visitor centre, tourist accommodation, play area and bike trail. The Site would be accessed from the neighbouring RES site at Mynydd Maen (a proposed wind farm of up to 13 turbines, Reference: DNS/3276725) subject to that development being consented. An access route to the adopted road is identified on the Location Plan (**Figure 1.1**), This route passes over common land¹. An additional access route to connect the Western and Eastern parcels will also be required.

2.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.3.1. The Proposed Development is to construct and operate a wind farm of up to four turbines and associated infrastructure including access tracks, transformer and substation and a grid connection which would enable connection to the substation located in the northern parcel of the Trecelyn Wind Farm site.

¹ [WOM21 Commons | DataMapWales \(gov.wales\)](#)

- 2.3.2. The combined maximum rated output of the Site will be up to 20MW of electrical power. The maximum rated output of the Site will be equivalent to the domestic needs of approximately 14,031 average households².
- 2.3.3. The wind farm will be designed with an operational life of 30 years. At the end of this period the Applicant has three options; to decommission the wind farm and dismantle and remove the turbines; to apply for an extension to the operating period using existing equipment; or apply to install new equipment on the Site. For the purposes of this assessment, it is assumed that the wind farm will be decommissioned.

KEY COMPONENTS OF THE SCHEME

Turbines

- 2.3.4. The proposed turbines are yet to be selected but the assessment of the application will be based on heights to blade tip of up to 180m and rotor diameter of up to 136m which has been used for scoping initial, potential effects. The turbines will be installed on foundations, comprising both stone and concrete. These will be dressed back with topsoil to allow re-vegetation. Turbine foundations could be larger or smaller, depending on imposed loadings, ground conditions and drainage design.

Turbine Foundations

- 2.3.5. The turbines will be installed on foundations, comprising both stone and concrete. These will be dressed back with topsoil to allow re-vegetation. Turbine foundations could be larger or smaller, depending on imposed loadings, ground conditions and drainage design.

Crane pads

- 2.3.6. Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to site the two cranes necessary to lift the three-tower section, nacelle and rotor into place. The crane hardstanding will be left in place following construction in order to allow for the use of similar plant should major components need replacing during the operation of the wind farm. These could also be utilised during decommissioning at the end of the wind farm's life. The total area of hard standing at each turbine location including the turbine foundations and the crane pad will be approximately 2,640m². It is anticipated that approximately a third of this area will be dressed back with topsoil and landscaped into the surrounding area upon completion of turbine erection.

Site access

- 2.3.7. Access to the site from the local road network is likely to be taken via the neighbouring RES site at Mynydd Maen, which proposes 13 wind turbines (Reference: DNS/327/6725). An indicative access route to the join the adopted road on which the Trecelyn Wind Farm is located, is identified on the scoping site location plan at **Figure 1.1**. An additional access route would be constructed between the eastern and western parcels of the site.

² Based on average domestic household usage of 3,239 kWh and a capacity factor of 25.9% for onshore wind. See <https://www.renewableuk.com/page/UKWEDEXplained/Statistics-Explained.htm>

Stone and concrete requirements and sourcing

- 2.3.8. Stone materials for track building are expected to be imported from local quarries; no borrow pits are proposed on the Site. Concrete for construction of the turbine foundations and substation structures will be imported to site.

Cabling

- 2.3.9. Underground cables will link the turbines to each other. Detailed construction and trenching specifications will depend on the ground conditions encountered at the time, but typically cables will be laid in a trench 750mm deep and 450mm wide.

CONSTRUCTION OF THE PROPOSED DEVELOPMENT

- 2.3.10. The construction period for the wind farm will last approximately 24 months. The construction process will consist of the following principal activities:
- Up-grading of existing tracks and construction of new access tracks and passing places inter-linking the turbine locations and substation;
 - Potentially remedial works to public highway to facilitate delivery of turbines which will be confirmed following discussion with the Highways Authority;
 - Formation of site compound including a hard standing and temporary site office facilities;
 - Construction of crane hardstanding areas to facilitate erection of turbines;
 - Construction of turbine foundations and transformer bases where required by the selected turbine;
 - Excavation of trenches and cable laying adjacent to site roads;
 - Connection of an on-site distribution and signal cables;
 - Delivery and erection of wind turbines;
 - Commissioning of site equipment; and
 - Site restoration.
- 2.3.11. Many of these operations will be carried out concurrently, although predominantly in the order identified to minimise the overall length of the construction programme. In addition, development will be phased such that at different parts of the Site, the civil engineering works will be continuing whilst wind turbines are being erected. Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.

DECOMMISSIONING OF THE PROPOSED DEVELOPMENT

- 2.3.12. The wind farm will be designed with an operational life of 30 years. When dismantling and removing the turbines the bases would be broken out to below ground levels and all cables cut at depth below ground level and left in the ground. Roads would either be left for use by the landowner or covered with topsoil. No stone would be removed from the Site. The decommissioning works are estimated to take six months. This approach is considered to be less environmentally damaging than seeking to remove foundations and cables entirely.
- 2.3.13. The turbine components themselves will be taken to an appropriate recycling facility where applicable. Due to the timescales, it is not possible to identify a specific facility at this time.
- 2.3.14. It should be noted that the developer will establish a decommissioning fund during the life of the project.



OFF-SITE INFRASTRUCTURE

- 2.3.15. All wind farms need to be connected into the grid distribution system, though such connections are often subject to a different consenting process to the wind farms themselves. The Applicant has undertaken discussions with National Grid Electricity Distribution (NGED) with regard to the grid connection for the Trecelyn Wind Farm in relation to the 132kv line that passes over the northern parcel of that site; and the landowner has accepted an offer with a Point of Connection (POC) on this land. For Rhyswg Wind farm, a grid connection will also be required. At this stage, the Applicant has identified that this will take the form of a connection to the proposed substation at the Trecelyn Wind Farm. It is understood that the intention is for NGED to deliver the connection potentially using its permitted development rights, or Section 37 of the Electricity Act. If it is subsequently decided that all or part of the connection should be overhead a separate DNS application would be required.

3 LEGISLATION AND PLANNING POLICY OVERVIEW

3.1 INTRODUCTION

3.1.1. This section provides an overview of relevant UK legislation and energy policy, devolved Welsh planning policy and the relevant planning policies of the Caerphilly County Borough Council's Local Development Plan. The policy framework will be described in full in a Planning Statement that will accompany the DNS application.

3.2 LEGISLATIVE CONTEXT

3.2.1. Relevant Welsh primary legislation on sustainability and climate change includes:

- The Wellbeing of Future Generations (Wales) Act – requires all Wales based public bodies to put long-term sustainability at the forefront of thinking and actions;
- The Environment (Wales) Act 2016 (as amended)– sets in place an obligation on the Welsh Government to reduce greenhouse gas emissions by 100% against 1990 levels in 2050;
- The Planning (Wales) Act 2015 – outlines powers given to Ministers to determine strategic energy projects of 10 – 50MW (subsequently amended to 350MW).
- The Infrastructure (Wales) Act 2024 – sets out changes to the energy infrastructure consenting regime and introduces thresholds for significant infrastructure projects (SIPs) between 50MW and 350MW to be considered by Ministers and a process for optional SIPs between 10MW and 50MW to be determined by Ministers, with regulations expected for implementation in summer 2025.

3.3 PLANNING POLICY CONTEXT

3.3.1. The Environmental Statement will consider planning policy which is relevant to the Proposed Development as summarised in the following sub-sections.

NATIONAL PLANNING POLICY CONTEXT

3.3.2. Future Wales: The National Plan 2040 (Future Wales from here on) is the National Development Framework for Wales, setting out the direction for development to 2040. It was published in February 2021. The intention of Future Wales is to provide a clear, long term spatial direction for Government policy, action and investment in Wales. It sets out a framework for addressing key national priorities through the planning system, inclusive of decarbonisation. Future Wales states:

“Future Wales together with Planning Policy Wales will ensure the planning system focuses on delivering a decarbonised and resilient Wales through the places we create the energy we generate, the natural resources and materials we use and how we live and travel.”

3.3.3. Future Wales also states that in respect of renewable energy:

“Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable sector, attract new investment and reduce carbon emissions.”

- 3.3.4. Future Wales is the primary document in the development plan and therefore the principal planning policy statement for renewable energy against which the planning application will be assessed.
- 3.3.5. Planning Policy Wales (PPW) published in February 2024 (Edition 12) land use planning policies and is supported by topic based Technical Advice Notes. The PPW is designed to ensure the planning system supports the delivery of sustainable development and improves social, economic, environmental and cultural well-being. Alongside Future Wales, the PPW outlines the way in which the planning system can support this delivery through Strategic and Local Development Plans. The PPW states in relation to renewable and low carbon energy that:

“Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department co-operation to achieve this. In doing so, planning authorities should seek to ensure their area’s full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved. Planning authorities should seek to maximise the potential of renewable energy by linking the development plan with other local authority strategies, including Local Well-being plans and Economic/Regeneration strategies.”

LOCAL PLANNING POLICY CONTEXT

Caerphilly County Borough Council

- 3.3.6. The scoping Site is located within the administrative area of Caerphilly CBC. The authority adopted the Caerphilly County Borough Local Development Plan (LDP) up to 2021 in November 2010.
- 3.3.7. **Table 3-1** summarises the provisions of the key policies (please note, this table is not an exhaustive list of all of the relevant policies, it is simply a summary of those policies of relevance to the Proposed Development).

Table 3-1 - Relevant key local planning policies and their implications

Policy Reference	Commentary
Caerphilly County Borough Local Development Plan (LDP) up to 2021 (2010)	
Policy SP2 Development Strategy – Development in the Northern Connections Corridor	This policy supports sustainable development in the Northern Connections Corridor which meets a number of criteria. In particular, it protects the natural heritage from development which is considered to be inappropriate.
Policy SP3 Development Strategy – Development in the Southern Connection Corridor	This policy supports sustainable development in the Southern Connections Corridor which meets a number of criteria. In particular, it protects the natural heritage from development which is considered to be inappropriate and advises that sustainable development will have regard to the social and economic function of the area.
Policy SP6 – Place Making	This policy requires development proposals to have full regard to the context of the local, natural, historic and built environment and its special features.
Policy SP8 – Minerals Safeguarding	LDP Policy SP8 identifies that the Proposed Development site area, along with most of the land within the Caerphilly CBC boundary, is safeguarded for minerals (Sandstone Safeguarded Area). It states that the Council will safeguard known resources from permeant

	development that would prevent their future working. The Proposed Development site is identified as the maximum extent of land potentially subject to the development for scoping purposes and the identification of land within its boundary does not necessarily mean that it will be developed upon.
Policy SP10 – Conservation of Natural Heritage	This policy advises that the Council will protect, conserve, enhance and manage the natural heritage of the Borough.
Policy CW2 - Amenity	LDP Policy CW2 seeks to protect the amenity of adjacent properties or land and ensure that the proposed use is compatible with surrounding land-uses / would not constrain the development of neighbouring sites for their identified land-use.
Policy CW4 – Natural Heritage Protection	Policy CW4 states development proposals within, or in close proximity to sites designated as Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Regionally Important Geological Sites (RIGS), Green Corridors, or Local Priority Habitats and Species, where proposals either: i) conserve and where appropriate enhance the ecological or geological importance of the designation, or ii) are such that the need for the development outweighs the ecological importance of the site, and where harm is minimised by mitigation measures and offset as far as practicable by compensation measures designed to ensure that there is no reduction in the overall value of the area or feature.
Policy CW15 – General Locational Constrains	Policy CW15 advises that outside settlement boundaries, proposals will not be permitted unless the proposed development is: “iv associated with the provision of public utilities, infrastructure and waste management facilities that cannot reasonably be located elsewhere.”
Policy CW22 Locational Constraints – Minerals	This policy sets out the requirements for permanent and temporary development uses within identified mineral safeguarding areas.
Area Specific Policies for the Northern Connection Corridor (NCC)	
Policy NH2 – Visually Important Local Landscapes	The Proposed Development site is within the Abercarn VILL (NH2.3). This policy advises that development will only be permitted where it conserves and, where appropriate enhances the distinctive visual and sensory landscape features of characteristics of the VILL.
Policy NH3 – Sites of Importance for Nature Conservation	LDP Policy NH3 identifies and protects a number of SINCS. Further information regarding the potential ecological features requiring consideration e.g. SINCS can be found within the biodiversity section.
Area Specific Policies for the Southern Connection Corridor (SCC)	
Policy NH2 – Visually Important Local Landscapes	The Proposed Development site is within the Abercarn VILL (NH2.3). This policy advises that development will only be permitted where it conserves and, where appropriate enhances the distinctive visual and sensory landscape features of characteristics of the VILL.
Policy NH3 – Sites of Importance for Nature Conservation	LDP Policy NH3 identifies and protects a number of SINCS. Further information regarding the potential ecological features requiring consideration e.g., SINCS can be found within the biodiversity section.

Policy TM1 – Tourism Proposals	The Proposed Development site falls partly within the Nantcarn Valley, Cwmcarn (TM1.7) which is allocated for tourism related activities under policy TM1.
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Other material considerations

- 3.3.8. The Council has also adopted the following Supplementary Planning Guidance (SPG) which will inform the assessment process:
- LDP4 – Trees and Development;
 - Wind turbine technical guidance:
 - Planning Guidance for Smaller Scale Wind Turbine Developments – Landscape and Visual Impact Assessment Requirements;
 - Smaller Scale Wind Turbine Development – Landscape Sensitivity and Capacity Study Final Report November 2021 (part 2).
- 3.3.9. The Council is currently in the process of producing a new LDP that would operate up to 2035, though this plan is in its early plan making stages and cannot inform planning decisions at this stage.

Torfaen County Borough Council

- 3.3.10. As noted in **Section 2.2** the proposed access route includes ~1km of access road within Torfaen CBC area. The authority adopted their current LDP up to 2021 in December 2013. As noted in Section 2.2 no turbines are proposed in the Torfaen CBC area.
- 3.3.11. **Table 3.2** summarises the provisions of the key policies (please note, this table is not an exhaustive list of all of the relevant policies, it is simply a summary of those policies of relevance to the Proposed Development).

Table 3.2 - Relevant key local planning policies and their implications

Policy Reference	Commentary
Policy S3 – Climate Change	This policy seeks to mitigate the causes of climate change and adapt to the current and future effects.
Policy BW1 – General Policy – Development Proposals	This policy identifies the criteria against which all development proposals will be considered. It includes a section about the natural environment (B) which seeks to protect the natural environment, including common land. It also provides criteria in respect of design and transport (E), and requires developers to design highways and their associated infrastructure in accordance with National and the Council’s latest adopted guides or standards.
Policy M1 – Minerals Safeguarding	This policy prevents development proposals which would permanently sterilise important mineral resources, unless there is an overriding need for the proposed development.

<p>Policy C2 – Special Landscape Areas (SLA's)</p>	<p>This policy identifies a number of SLA's, including C2/4 South West Uplands, which part of the access route runs through. This policy advises that proposals which could impact on these designations will be expected to conform to high standards of design and environmental protection, appropriate for the LANDMAP character of the area.</p>
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Other material considerations

- 3.3.12. The Council has also adopted the following Supplementary Planning Guidance (SPG) which will inform the assessment process:
- Green Infrastructure SPG;
 - Biodiversity, Ecosystem Resilience and Development SPG.
- 3.3.13. The Council is currently in the process of producing a new LDP that would operate up to 2037, though this plan is in its early plan making stages and cannot inform planning decisions at this stage.

4 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

4.1 OVERVIEW OF THE PROCESS

- 4.1.1. EIA is a systematic process that must be followed for certain categories of project before they can receive development consent. It aims to identify a project's likely significant effects through the Scoping process, and then assess those effects, which will be reported in an Environmental Statement. This helps to ensure that the predicted effects, and the scope for mitigation measures to reduce them where necessary, are properly understood by the public and PEDW before it makes its decision.
- 4.1.2. The EIA process should be systematic, analytical, impartial, consultative and iterative allowing opportunities for environmental concerns to be addressed in the design of a project. Typically, a number of design iterations take place in response to environmental constraints identified during the EIA process prior to the final design being reached.
- 4.1.3. The EIA process should be based upon on recognised good practice and guidelines specific to each technical area and identify the likely significant environmental effects arising from a proposed development. Consultees are also encouraged to provide confirmation of agreement to the proposed scope in terms of what is included and excluded, the methodology and the receptors identified.

4.2 EIA TERMINOLOGY

IMPACTS AND EFFECTS

- 4.2.1. EIA is concerned with the identification of likely significant effects on the environment. However, the terms impact and effect are often used synonymously and this can lead to confusion. For clarity, the convention used in this assessment is to use 'impacts' within the context of the term EIA, which describes the process from Scoping through to Environmental Statement preparation to subsequent monitoring and other work. Otherwise, this document uses the word 'effects' when describing the environmental consequences of the Proposed Development. For example, such effects may come about as a result of the following:
- Physical activities that would take place if the development were to proceed (e.g., vehicle movements during construction operations);
 - Environmental changes that are predicted to occur as a result of these activities (e.g., loss of vegetation prior to the start of construction work or an increase in noise levels). In some cases, one change causes another change, which in turn results in an environmental effect.
- 4.2.2. The predicted environmental effects are the consequences of the environmental changes for specific environmental receptors. For example, with respect to bats, the loss of roosting sites or foraging areas could affect the bats' population size; with regard to people, an increase in noise levels could affect amenity.
- 4.2.3. This assessment is concerned with assessing the significance of the environmental effects of the Proposed Development, rather than the activities or changes that cause them. However, this requires these activities to be understood and the resultant changes identified; often based on predictive assessment work.

TYPE OF EFFECT

4.2.4. The 2017 EIA Regulations (Schedule 4, Part 5) require consideration of a variety of types of effect, namely direct / indirect, secondary, cumulative, positive / negative, short / medium / long-term, and permanent / temporary. In the Environmental Statement that will follow this Scoping Report, effects are considered in terms of how they arise, their nature (i.e., whether they are positive or negative) and duration. Each will have a source originating from the Proposed Development, a pathway and a receptor and may fall into one of several categories:

- Direct effects are readily identified because of the physical connection between some element of the development and an affected receptor;
- Indirect effects require some additional pathway for the effect to arise. For example, a listed building may not be directly affected by any elements of a development, but its setting may be if the development is visible in views from it or when looking towards it; in which case there would be an indirect effect;
- Secondary effects would typically require further pathway connections, for example, an effect on a receptor population A could have a secondary effect on receptor population B, if B was itself dependent on A in some way, as, for example, a food source; and
- Cumulative effects arise when the receptors affected by one development are also affected by other developments resulting in the aggregation of environmental effects or the interaction of impacts.

4.2.5. Most predicted effects will be positive or negative and will be described as such. However, in some cases it is appropriate to identify that the interpretation of a change is a matter of personal opinion, and such effects will be described as 'subjective'.

TEMPORAL AND SPATIAL SCOPE

4.2.6. In its broadest sense, the spatial scope is the area over which changes to the environment would occur as a consequence of the development. In practice, an EIA should focus on those areas where these effects are likely to be significant.

4.2.7. The spatial scope varies between environmental topic areas. For example, the effect of a proposed development on the landscape resource and visual amenity is generally assessed within a zone of up to 35km from the wind turbines (and potentially up to 70km for cumulative effects), whilst noise effects are assessed within a much smaller area encompassing those representative properties close to a development site.

4.2.8. The temporal scope is stated where known and effects are typically described as:

- Temporary - likely to be related to a particular activity and will cease when the activity finishes. The terms 'short-term' and 'long-term' may also be used to provide a further indication of how long the effect will be experienced; and
- Permanent – this typically means an unrecoverable change.

4.2.9. Effects are generally considered in relation to the following key stages of a proposed development:

- Construction – the effects may arise from the construction activities themselves, or from the temporary occupation of land. Effects are often of limited duration although there is potential for permanent effects. Where construction activities create permanent change, the effects will continue into the operational period;

- Operation – effects may be permanent, or they may be temporary, intermittent, or limited to the life of a proposed development until decommissioning (as in the case of wind power developments which gain planning permission for a defined and finite number of years); and
- Decommissioning – effects may arise from the decommissioning activities themselves, or from the temporary occupation of land. The effects would generally be temporary and of limited duration. Additional permanent change would normally be unlikely unless associated with restoration.

4.3 EIA SCOPING

- 4.3.1. The results of the EIA process are reported in an Environmental Statement and Schedule 4(4) of the EIA Regulations specifies that it should describe those “...*factors...likely to be significantly affected by the development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape*”.
- 4.3.2. Regulation 4(2) of the EIA Regulations requires the interaction between these factors to be considered. In addition, Regulation 4(4) requires Environmental Statements to consider “...*the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and disasters*”.
- 4.3.3. Establishing which aspects of the environment are likely to be significantly affected by a particular project is captured in the EIA Scoping process which aims to identify those aspects of the environment and associated issues that need to be considered when assessing the potential effects resulting from a proposed development. This recognises that there may be some environmental elements for which the project is unlikely to have a significant effect and hence where there is no need for further investigation to be undertaken as part of the EIA.
- 4.3.4. The scope and assessment methodologies proposed in this Scoping Report are based on recognised good practice and guidelines specific to each topic area. Baseline conditions have been determined through desk-based studies and survey work undertaken to date. The environmental topic chapters identify where significant effects are anticipated as a result of the Proposed Development and take into account:
- Baseline data from surveys;
 - The description of the Proposed Development;
 - Relevant guidance on assessment methodologies; and
 - Any cumulative effects which may arise.

4.4 CUMULATIVE EFFECTS

- 4.4.1. Cumulative effects can arise from the interaction between a proposed development and other developments proposed or under construction. In line with standard practice, for the purpose of the EIA, other wind farm developments which are operational, subject to planning approval or subject to a full and validated planning application will also be included in the consideration of potential cumulative effects (subject to a cut-off point to allow assessments to be undertaken). It should be noted that not all of the cumulative developments would necessarily have a cumulative effect in respect of any particular environmental topic.

4.5 MITIGATION

- 4.5.1. Some mitigation measures to avoid, reduce or offset the consequences of the Proposed Development would be embedded within its design whilst others may require adherence to particular constraints on construction methodology or mode of operation. The final assessment of significance will take into account the mitigation measures and constraints that have been incorporated into the Proposed Development (i.e. it will be the assessment of residual effects).
- 4.5.2. It is likely that the following management plans will be submitted as part of the EIA or as a post-consent condition:
- Construction Environmental Management Plan (CEMP);
 - Habitat Management Plan (HMP); and
 - Construction Traffic Management Plan (CTMP).

4.6 EIA METHODOLOGY

- 4.6.1. The Environmental Statement will identify the assessment methodologies based on recognised good practice and guidelines specific to each of the relevant environmental topic areas where the Proposed Development could result in significant effects. In general terms, the technical studies undertaken for each topic area and chapter included in the Environmental Statement to accompany the planning application would include:
- Collection and collation of existing baseline information about the receiving environment and surveys to fill any gaps in knowledge or to update any historic information, together with identification or any relevant trends in, or evolution of, the baseline;
 - Consultation with experts and relevant consultees as necessary;
 - Consideration of the potential effects of the Proposed Development on the baseline, followed by identification of any additional mitigation measures to seek to avoid or reduce any predicted adverse effects;
 - Assessment and evaluation of any residual significant effects after mitigation measures have been implemented; and
 - Compilation of the Environmental Statement chapter.

SIGNIFICANCE EVALUATION METHODOLOGY

- 4.6.2. The receptors that could be significantly affected, and therefore be taken forward for consideration in further detailed assessment in the ES, will be identified. A combination of professional judgement and a topic-specific significance evaluation methodology will be adopted to determine whether the effects on these receptors are significant.
- 4.6.3. In applying this approach to significance evaluation, it is necessary to ensure that there is consistency between each environmental topic in the level at which effects are considered to be significant. Thus, it is inappropriate for the assessment of one topic to conclude that minor effects are significant, when, for another topic, only comparatively major effects are significant.
- 4.6.4. In order to achieve the desired level of consistency, each topic chapter will consider the 'significance test' to inform their decision on whether effects are likely to be significant or not. Alongside this, consideration will also be given to the relevant topic-specific significance evaluation methodologies. This approach will also be adopted for the technical assessments to be included in the ES.

- 4.6.5. For some of the topics to be assessed in the ES, there is published guidance available about significance evaluation. Where such guidance exists, even if in draft, it will be used to inform the development of the significance evaluation methodologies to be used in the ES. For other topics, it will be necessary to develop methodologies without the benefit of guidance. This will involve technical specialists drawing on their previous experience of significance evaluation in EIA.

Evaluation Matrices

- 4.6.6. Significance evaluation involves combining information about the sensitivity or value of a receptor, and the magnitude and other characteristics of the changes that affect the receptor. The approach to using this information for significance evaluation is outlined below.

Receptor Sensitivity of Value

- 4.6.7. The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level.
- 4.6.8. The use of a receptor would also play a part in its classification. For example, when considering effects on the amenity of a human population, a receptor used for recreational purposes may be valued more than a place of work as the environmental quality of the recreational receptor is more likely to be an important part of that receptor's use.

Magnitude of Change

- 4.6.9. The magnitude of change affecting a receptor that would result from the Proposed Development would be identified on a scale from minor alterations of change, up to major changes or the total or substantial loss of the receptor. For certain topics, the magnitude of change would be related to guidance on levels of acceptability (e.g., for noise), and be based on numerical parameters, whilst for others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology.

Determination of Significance

- 4.6.10. The determination of significance is derived with reference to information about the nature of the Proposed Development, the sensitivity or value of receptors that could be affected, together with the magnitudes of change that are likely to occur. For many environmental aspects, significance can be determined by using a matrix (see **Table 4.1**).
- 4.6.11. Variations to this matrix approach, which may be applicable to specific environmental topics (e.g. ecology and ornithology), will be detailed in the relevant 'assessment methodology' sub-section contained in each environmental topic chapter. Definitions of how the categories that are used in the matrix are derived for each topic are also set out in each environmental topic chapter, along with the relevant explanation and descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant in terms of the EIA Regulations.
- 4.6.12. In addition, professional judgement is applied in the assessment, as the lines between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying.

4.6.13. The overall significance matrix that will be used for the EIA is shown in **Table 4-1**. Reference is made to:

- Major effects, which will always be determined as being significant in EIA terms;
- Moderate effects that may be significant, although there may also be circumstances where such effects are considered 'not significant' based on specific scenarios and professional judgement; and
- Minor or negligible effects, which will always be determined as 'not significant'.

4.6.14. Effects can be beneficial or adverse.

Table 4-1 - Example significance evaluation matrix

		Magnitude of change				
		Very high	High	Medium	Low	Very low
Sensitivity/importance/value	Very high	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

4.7 CONSULTATION

- 4.7.1. Consultation is an essential element of the EIA and DNS application processes and will be reported within the Environmental Statement and application supporting documentation (such as a Pre-Application Consultation Report) as necessary.
- 4.7.2. The Applicant is committed to promoting dialogue with statutory and non-statutory consultees and the local community, seeking to engage with all those with an interest in the Proposed Development to provide transparency during the process.

5 SCOPE OF THE ASSESSMENT

5.1 CONTENT OF THE ENVIRONMENTAL STATEMENT

5.1.1. In accordance with the EIA Regulations and good practice, the ES will contain:

- A non-technical summary (which will be available as a standalone document);
- A description of the proposed development comprising information on the need for the development, alternatives that have been considered and a description of the development;
- Information about the consents required if the development is to proceed and the policy context to the development;
- A definition of the EIA process, including the various steps in the EIA process, terminology, and the assessment methodology;
- Separate chapters setting out the assessment relating to each environmental topic, including:
 - A description of baseline conditions, including information about how these might change during the course of the development;
 - A description of any measures that have been incorporated into the proposed development with a view to delivering environmental benefits;
 - The scope of the assessment and the methodologies adopted;
 - Assessments and evaluations of significance of predicted effects - dealing, in turn, with each receptor/resource that has been assessed in detail;
 - A summary of the evaluations of significance; and
 - Proposals for implementing environmental and mitigation measures.
- An assessment of cumulative effects; and
- An appraisal of the effects of the scheme against relevant planning and environmental policies.

5.2 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.2.1. This section sets out the proposed scope of the Landscape and Visual Impact Assessment (LVIA) which will assess the likely significant effects, including cumulative effects of the Proposed Development on landscape and visual amenity receptors. A Residential Visual Amenity Assessment (RVAA) will also be included.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

5.2.2. Table 5-1 lists the relevant planning policies.

Table 5-1 - Relevant policies and their implications – landscape and visual

Policy	Policy context
National planning policy	
Future Wales - The National Plan 2040	Policy 17 – Renewable and Low Carbon Energy and Associated Infrastructure notes that there is a presumption in favour of large-scale wind energy development in

	<p>Pre-Assessed Areas for wind developments (which the Welsh Government has already modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way), subject to the criteria in Policy 18. The Proposed Development Site lies partially within Pre-Assessed Area 10. The policy continues by stating that all proposals should demonstrate that they will not have an unacceptable adverse impact on the environment.</p> <p>Policy 18 – Renewable and Low Carbon Energy Developments of National Significance. Proposals qualifying as Developments of National Significance will be permitted subject to Policy 17 and the criteria listed under Policy 18. Of relevance to the LVIA for the Project, item 2 requires that there are no unacceptable adverse visual impacts on nearby communities and individual dwellings. The cumulative impacts of existing and consented renewable energy schemes should also be considered.</p>
<p>Planning Policy Wales, Edition 12</p>	<p>With specific reference to large scale wind developments and the landscape, paragraph 5.9.17 recognises that Future Wales identifies Pre-Assessed Areas where the Welsh Government has already modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way. There is a presumption in favour of large-scale wind energy development in these areas, subject to other criteria contained within the policy.</p> <p>General LVIA issues are included in Chapter 6 - Distinctive and Natural Places and more specifically within Section 6.3 Landscape.</p> <p>Paragraph 6.3.12 and 6.3.13 relate to non-statutory designations such as Special Landscape Areas that define local areas of high landscape importance, which may be unique, exceptional or distinctive to the area. Planning authorities should apply these designations where there is good reason to believe that normal planning policies cannot provide the necessary protection.</p> <p>Paragraphs 6.3.19 and 6.3.21 concerns the use of LANDMAP and its role in informing landscape assessments needed to inform local authorities in making local policy, guidance and decision making.</p>
<p>Local planning policy</p>	
<p>Caerphilly County Borough Council (CCBC) Local Development Plan up to 2021</p>	<p>Policy SP10 - Conservation of Natural Heritage. This Policy seeks to protect, conserve and enhance the natural heritage of the Borough. This covers the geology, geomorphology, biodiversity, landscape and amenity value.</p>

	<p>Policy CW2 – Amenity. This policy outlines that development proposals should reference relevant material planning considerations to avoid unacceptable impact on the amenity of adjacent properties or land. Although the effects are considered to predominantly relate to residential proposals, the policy applies to all forms of development and includes consideration of the adverse effects of a development on adjoining uses.</p>
	<p>Policy CW4 - Natural Heritage Protection. This policy seeks to protect natural heritage from inappropriate development. In terms of landscape, the policy states that development proposals will only be permitted where “they conserve and where appropriate enhance the distinctive or characteristic features of the Special Landscape Area (SLA) or Visually Important Local Landscape (VILL).”</p>
	<p>Policy CW6 – Trees, Woodland and Hedgerow Protection. This policy determines that development proposals will only be permitted where all reasonable efforts have been made to retain, protect and integrates trees, woodland or hedgerows within the Proposed Development site. Should trees, woodlands or hedgerows be removed as part of a development proposal, suitable replacements should be provided. The LDP also provides Supplementary Planning Guidance LDP 4 – Trees and Development.</p>
	<p>Policy CW15 – General Locational Constraints. This policy states development proposals outside settlement boundaries will not be permitted unless associated with the provision of public utilities/ infrastructure that cannot be reasonably located elsewhere.</p>
	<p>Policy NH1 - Special Landscape Areas. This policy identifies six non-statutory SLA designations. The text accompanying the policy states that “these areas will be protected from any development that would harm their distinctive features or characteristics” and that the applicant will need to demonstrate that any development proposal will not have an unacceptable impact on the specific distinctive features or characteristics associated with the SLA.</p>
	<p>Policy NH2 – Visually Important Local Landscapes (VILLS). This policy classifies four non-statutory VILL designations. The text accompanying the policy states that “development will only be permitted where it conserves and, where appropriate, enhances the distinctive visual and sensory landscape features or characteristics of the VILL” and that development proposals should show how these features of the visual and sensory LANDMAP aspect layer are conserved and, where relevant enhanced to the advantage of the visual landscape.</p>

<p>Bannau Brycheiniog National Park (BBNP) Authority Local Development Plan 2007-2022</p>	<p>SP9 - Renewable Energy. Whilst this policy refers to renewable energy schemes within the National Park, the accompanying text at paragraphs 3.16.2.9 and 3.16.2.10 recognises the potential impact of large-scale renewable energy projects located on the peripheries of the National Park which will be judged in accordance with SP2 Major Development in the National Park. Policy SP9 states that proposals for renewable energy schemes will only be permitted where they do not have a significant adverse impact on the Natural Beauty, wildlife, cultural heritage and special qualities of the National Park.</p>
	<p>SP2 - Major Development in the National Park – Strategic Policy. Major development in the National Park, should only take place in exceptional circumstances, where proven to be in the public interest. Proposals will be judged against a number of criteria including any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which these could be moderated.</p>
	<p>Policy 12 - Light Pollution. This policy states that proposals where lighting is required, it will be permitted where: the lighting proposed is appropriate to its purpose; and there is not a significant adverse effect individually or cumulatively on a number of criteria including (of relevance to the LVIA), the character of the area and the visibility of the night sky.</p>

Legislation

- Wellbeing of Future Generations (Wales) Act 2015;
- Environment (Wales) Act 2016; and
- National Parks and Access to the Countryside Act 1949.

Technical Guidance

- 5.2.3. The Landscape and Visual Impact Assessment (LVIA) will be conducted in accordance with the third edition of the Guidelines for Landscape and Visual Impact Assessment (hereafter referred to as GLVIA3) produced by the Landscape Institute and the Institute of Environmental Management and Assessment. The guidance in this document is widely regarded by the landscape and planning professions as the ‘industry standard’ and a methodology based on GLVIA3 will be adopted together with best practice and professional experience.
- 5.2.4. The LVIA will also take account of other relevant technical guidance which includes (but is not limited to) the following:
- Using LANDMAP in Landscape and Visual Impact Assessments (GN46);
 - Visual Representation of Windfarms (Version 2.2);
 - Visual Representation of Development Proposals;
 - Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments;
 - Technical Information Note 2/2019. – Residential Visual Amenity Assessment;
 - Technical Information Note 04/2020 – Infrastructure.

BASELINE

- 5.2.5. A range of desk-based and site-based data will be sourced to undertake the LVIA and cumulative landscape and visual impact assessment (CLVIA), covering landscape and visual receptors and other cumulative wind farm development.

Preliminary LVIA Study Area

- 5.2.6. The LVIA Study Area for the Proposed Development has been defined in accordance with NRW guidance contained in a review of LANDMAP Guidance Note 46 – Using LANDMAP in Landscape and Visual Impact Assessments. A LVIA Study Area allowing a minimum of 24km from each of the proposed turbine locations within the Rhyswg Wind Farm site boundary accords with the separation distance ratio of 1:133 for 180m blade tip height turbines to potentially have “an average low magnitude of effect on a high sensitivity receptor” as specified in the extent of search and study areas for tall structures section of Guidance Note 46.

Zone of Theoretical Visibility

- 5.2.7. Analysis of the preliminary blade tip and hub height Zone of Theoretical Visibility (ZTV) mapping is used to assist the refinement of the Proposed Development and further define the scope of the LVIA. A preliminary ZTV has been generated to inform the Scoping Report and facilitate initial viewpoint selection. This Preliminary ZTV is shown in Figure 5.1 (with more detailed background mapping in Figure 5.2) and has been calculated using ReSoft WindFarm computer software. The Digital Elevation Model used as part of the ZTV calculation does not take account of built development or vegetation. As these elements can significantly reduce the extent of actual visibility, the ZTVs therefore represent the maximum theoretical visibility of the Proposed Development. As such, the ZTVs are likely to over-estimate the extent of areas from which views of the Proposed Development may be available to visual receptors within their communities, engaged in outdoor recreation or travelling on roads in the LVIA study area. The ZTVs therefore provide a starting point in the assessment process.

Current Baseline Conditions

The Site and Immediate Area

- 5.2.8. The Proposed Development will take place over two parcels of land comprised of a mix of semi-improved and unimproved grassland. The location of the two parcels is identified below:
- Eastern Parcel – Grid Reference ST 23536 94765
 - Western Parcel – Grid Reference ST 22272 94403
- 5.2.9. The Site is located on the upper slopes (between approximately 330 m and 390 m AOD) of ridges that extend to the west and south-west of the massif formed by Mynydd Llwyd, Mynydd Twyn-glas and Mynydd Maen. To the north of the Site is the deeply incised and heavily afforested valleys of Nant Gwyddon, which joins the Ebbw River at Abercarn. Beyond this several tributaries of the Ebbw River have created a complex of ridges and valleys that reduce in elevation westward toward the valley of the Ebbw River. The most southerly of these is the steep-sided Cwm Hafod-fach, the northern end of which is occupied by the Hafod sandstone quarry.
- 5.2.10. With regard to Public Rights of Way (PRoW), the central section of the Eastern Parcel is traversed by several restricted byways which also run along part of the northern and part of the southern boundary. The south-east section of the Eastern Parcel is traversed by a public footpath, which runs

adjacent to part of the southern boundary. There are no PRow within the Western Parcel albeit there are several footpaths and restricted byways nearby.

- 5.2.11. There are several residential properties within or within close proximity to the two parcels. The most notable of which is Cefn Rhyswg Farm, located within the Western Parcel. The nearest settlement is Abercarn, the outskirts of which are approximately 300m to the west of the Western Parcel. Cwmcarn is also located approximately 400m to the south of the Western Parcel.

Landscape Baseline

- 5.2.12. The site falls partially within the Pre-Assessed Areas (PAA) for Wind Energy (Area 10) as designated in Future Wales. Policy 17 of Future Wales states that in PAA for wind energy, the Welsh Government has already modelled the likely impact on the landscape and considers them to be capable of accommodating development in an acceptable way.
- 5.2.13. At a national level, the site lies within the South Wales Valleys National Landscape Character Area (NLCA) 37, the key characteristics of which are described as follows³:
- “Extensive Upland plateaux – typically wild and windswept, often with unenclosed tracts, running roughly north-south as ‘fingers’ parallel between intervening deep valleys;
 - Numerous steep-sided valleys - typically aligned in parallel, flowing in southerly directions, shaped by southward flowing glaciers, leaving behind distinctive corrie ('cwm') and crag features. Major rivers include the Tawe, Taff and Rhymney;
 - Ribbon urban and industrial areas in valleys – in places extending up valley sides and to valley heads. The area is sometimes regarded as being part of a ‘city region’. Middle and eastern valleys tend to be the most heavily and continuously developed, e.g., Rhondda Valley. The uplands by comparison have little or no settlement;
 - Extensive remains of heavy industry – with a mix of derelict, preserved and largely redeveloped areas, notably for coal mining. Preserved as heritage (World heritage Site) at Blaenavon this typically includes old railway alignments, buildings and former tips;
 - Contrast of urban valley activity next to quiet uplands – e.g. busy roads, new developments, traffic noise, night lighting, verses the adjacent wilder, remoter, quieter uplands;
 - Large blocks of coniferous plantation and deciduous woodland fringes – covering many steep hillsides and hilltops, most notably in the middle to western portion of the area, providing a softer contemporary landscape where there was once industry;
 - Heather, rough grassland and steep bracken slopes – dominate many plateaux and are grazed mainly by sheep. Much is common land;
 - Improved pastures on some lower valley sides - grazed by sheep and some dairy cattle;
 - Field boundaries - dry stone walls mark the boundary of common land while fields on lower slopes are bounded by dense hawthorn hedges, interspersed with swathes of broadleaved woodland;

³ [NLCA37 South Wales Valleys - description \(cyfoethnaturiol.cymru\)](https://www.nlcawales.gov.uk/nlca37-south-wales-valleys-description-cyfoethnaturiol.cymru)

- Transport routes restricted to valleys – the intervening topography makes valley to valley travel difficult, except at heads and bottoms of valleys. Occasionally there are roads that climb steeply over passes with dramatic views and ‘hair pin’ bends;
- Iconic cultural identity – many popular images of a tough, rugby-playing, religious, radically-minded society still remain associated with the South Wales Valleys, however today’s post-industrial, internet-connected reality is somewhat different.”

5.2.14. With respect to LANDMAP, the site is located in the following host aspect areas:

- Geological Landscape Aspect Areas – CYNONGL001: Upper Ebbw Valley & CYNONGL002: Nant Gwyddon;
- Landscape Habitats Aspect Areas –CYNONLH149, CYNONLH161 & CYNONLH151;
- Visual and Sensory Landscape Aspect Areas – CYNONVS214: Mynydd Llwyd and Mynydd Maen & CYNONVS372: Mynydd Maen;
- Historic Landscape Aspect Area – CYNONHL405: Rhyswg & CYNONHL007 Cwmcarn Forestry; and
- Cultural Landscape Services Aspect Areas – CYNONCLS050: Mynydd Maen & CYNONCLS026: Mynydd Llwyd and Mynydd Maen.

5.2.15. LANDMAP Guidance Note 46 specifically cross references LVIA using LANDMAP data to the concept of landscape value as identified and defined in the third edition of Guidelines for Landscape and Visual Impact Assessment. In accordance with LANDMAP Guidance Note 46 aspect areas for all five aspect layers will be included within the landscape assessment. The selection of which individual aspect areas to included will again be guided by LANDMAP Guidance Note 46, which specifies processes for ‘filtering’ the five different types of aspect area.

5.2.16. The site does not lie within any nationally designated landscape, although the BBNP is located approximately 8km to the north-east. The Wye Valley Area of Outstanding Natural Beauty (AONB) lies approximately 23km to the east of the Site.

5.2.17. At a local level, the site lies within the locally designated Abercarn Visually Important Local Landscape (VILL) within Caerphilly. A series of other locally designated landscape lie within the wider surroundings to the site, such as the South West Uplands Special Landscape Ares (SLA) within Torfaen, the Mynyddislwyn SLA within Caerphilly, as well as the Blaenavon Industrial Landscape World Heritage Site (WHS). The proposed scope of the historic environment assessment is set out in Chapter 5.3.

Visual Baseline

5.2.18. Visual receptors can be broadly sub-divided into three categories:

- Those who live in the LVIA study area i.e. people within their communities;
- Those who undertake outdoor recreational activities at locations or along routes through the LVIA study area i.e. recreational visual receptors; and
- Those who travel through the LVIA study area i.e. transport visual receptors.

5.2.19. The baseline distribution of these categories of visual receptors will be set out within the Environmental Statement.

Future Baseline Conditions

- 5.2.20. It is likely that the future baseline will alter in the short to medium term as a result of the recent increase in renewable energy applications in south-east Wales. Wind energy developments that are relevant to the cumulative assessment, and their location, will be identified as part of the EIA process.
- 5.2.21. In the long term there is potential for large-scale changes in agricultural practices in response to national or international agricultural and environmental policy. The long-term continuation of the decline of 'family' farms and the amalgamation of farm units into fewer, more intensively managed farm businesses could gradually lead to changes such as amalgamation of fields and the introduction of larger scale, less vernacular agricultural buildings. Should livestock farming continue to decline it is likely there would be a commensurate long-term decline in the management of field boundaries and a subsequent decline in the strength of field patterns, especially on more marginal elevated areas.
- 5.2.22. The UK climate is changing, and climate models indicate that this rate of change could accelerate. The predicted future baseline will alter in response to future climate change, such as, higher temperatures and changes to rainfall patterns and intensity. Many of these changes will, at least initially, be subtle, for example, extended growing seasons for certain crops. The following changes with a high likelihood of occurrence could directly or indirectly affect landscape character or levels of visibility:
- Warmer summers and an associated longer growing season potentially affecting the range of crops that can be grown;
 - Wetter winters with consequent local flooding;
 - Decreases in soil moisture in summer and autumn and associated increased potential for drought stress on vegetation, such as hedgerows and hedgerow trees; and
 - Increased levels of tree loss, especially of more mature trees, due to the anticipated increase in the incidences and severity of winter storms and the increased incidence of diseases affecting specific tree species such as chalara for ash trees.

THE SCOPE OF THE ASSESSMENT

- 5.2.23. The methodology, scope of landscape and visual receptors, together with a list of viewpoints representative of the visual receptors will be agreed with the relevant consultees.

Potential Receptors

Zone of Theoretical Visibility and Viewpoint Analysis

- 5.2.24. **Figure 5.1** (with more detailed background mapping in **Figure 5.2**) shows a preliminary ZTV that has been calculated based on an indicative layout consisting of up to three turbines, each with a maximum blade tip height of 180m above ground level (AGL) and a nacelle (hub) height of 112m AGL.
- 5.2.25. The proposed photographic viewpoint locations, which are also shown on Figure 5.1 and 5.2, are provided to inform the identification of photographic viewpoint locations to support the LVIA. For the avoidance of doubt, visual and landscape receptors located outside the coloured areas of the ZTV would have no view of any of the proposed turbines (or any other component of the proposed development) and landscape and visual receptors within these areas are consequently scoped out of the LVIA.

Confirmation of Cumulative LVIA Study Area

- 5.2.26. A review has been undertaken of SNH guidance on cumulative assessment⁴, LANDMAP Guidance Note 46 and information on existing, consented and proposed wind farms within the LVIA search area. A Cumulative LVIA (CLVIA) study area of 26km radius is considered fit for purpose, being sufficient to assess all potential significant cumulative landscape and visual effects.
- 5.2.27. SNH Guidance recommends that micro-generation turbines (25-50 m) within 5km only need to be included if they consist of three or more turbines. In line with SNH guidance all single turbines beyond 10km are also excluded. Despite the uncertainty of their attaining operational status, wind farms at scoping stage will be included if they exhibit high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced.

Viewpoint Selection and Visualisations

- 5.2.28. A preliminary list of LVIA viewpoints (to be refined through fieldwork and consultation) has been identified (see **Table 5-2**). The locations of viewpoints are illustrated in **Figure 5.1**.

Table 5-2 - Proposed LVIA viewpoints

Viewpoint No	Viewpoint	Co-ordinates	Viewpoint Typology (GLVIA3)/ Principal Receptor(s)	Rationale
1	Dan-Y-Rhiw Terrace, West End, Abercarn	321212, 195172	Representative - residential receptors	Representative of the views available to residents on the western side of the Ebbw Valley at its closest point to the Proposed Development.
2	Twmbarlwn Iron Age Fort summit	324200, 192612	Specific & representative – recreational receptor	Northern side of summit noted on OS maps as providing 360 degrees views. Popular with locals and visitors with carpark provided. Representative of the clearest views likely to be available to users of the Cambrian Way and Taith Torfaen Anytime Challenge path to the south of the Proposed Development.
3	Open space on Old Pant Road, Panside	321975 , 197866	Representative - residential receptors	Representative of the views available to residents in elevated locations on the eastern side of the Ebbw Valley to the immediate west of the Proposed Development.

⁴ <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments#Introduction+and+scope+of+this+guidance>

4	Trig point at the summit of Mynydd Maen/Mynydd Llwyd	325996, 197811	Representative - recreational receptors	Representative of the views available to users of the Taith Torfaen Anytime Challenge path, the local PRow network and the open access land to the immediate east of the Proposed Development.
5	Open space on Fflorens Road, Treowen	320863, 198034	Representative - residential receptors	Representative of the views available to residents in elevated locations on the western side of the Ebbw Valley to the west of the Proposed Development.
6	Mynydd Machen	322336, 190119	Representative - recreational receptors	Representative of elevated northerly views available to users of a number of long distance routes (including the Cambrian Way, the Sirhowy Valley Ridgeway Walk and the Rhymney Valley Ridgeway Walk), the PRow network and open access land within the preliminary ZTV.
7	Rhymney Valley, Ridgeway Walk	317091, 192654	Representative - recreational receptors	SLA, users of the PRow long distance path.
8	Monnow Way, Bettws	328727, 190296	Representative - residential receptors	Representative of the views available to residents in elevated locations, west of the Monmouthshie & Brecon Canal, to the southeast of the Proposed Development.
9	Pen-y-Fan Pond Country Park	319660, 200695	Specific – recreational receptor	The view available to visitors to the park. The clearest view of the Proposed Development is likely to be from the PRow/ Access Land on track through northern part of the park.
10	PRow east of St. Illtyd	322079, 201870	Representative - residential & recreational receptors	Representative of the middle-distance views available to residents of elevated properties and users of the dense PRow network in the vicinity of St. Illtyd/ Llanhiledd to the north of the Proposed Development.
11	Cefn Fforest/ Blackwood Show Fields	316737, 197951	Representative - residential & recreational receptors	Residential area and users of the popular recreational area
12	B4236, Llanfrechfa	331612, 193748	Representative - residential receptors and road users	Representative of the views available to residents and road users of the B4236 on the eastern side of the Llwyd Valley to the east of the Proposed Development.

13	Northern edge of Gelligaer	313315, 197072	Representative - residential & recreational receptors	Representative of the middle-distance views available to residents of elevated properties and users of the Rhymney Valley Ridgeway Walk and PRoW network to the north of Gelligaer, to the west of the Proposed Development.
14	Wellfield Close, west of Coed-y-paen	333146, 198409	Representative - recreational receptors	Representative of the views available to recreational receptors accessing Llandegfedd Lake Visitor & Activity Centre as well as road users of Wellfield Close, west of Coed-y-paen, to the east of the Proposed Development.
15	Lasgarn Lane, BBNP	328863, 204152	Representative - recreational receptors	Located to the northeast of Pontypool Golf Club on the edge of the BBNP within the preliminary blade tip ZTV. Representative of the middle-distance views available to visitors to the BBNP and users of the Cambrian Way, Monmouthshire Way and Taith Torfaen Anytime Challenge path to the northeast of the Proposed Development.
16	Gelligaer Common and Rhymney Valley Ridgeway Walk	312691, 199372	Specific & representative – recreational receptor	Historic Landscape, SLA, and users of the Public Right of Way (PRoW) long distance path.
17	Caerphilly Common	315308, 185545	Specific – recreational receptor	SLA, Caerphilly Common, users of the popular viewpoint.
18	Rhymney Valley Ridgeway Walk on Mynydd Mieu	311435, 188372	Representative - recreational receptors	Representative of the long-distance views available to users of the Rhymney Valley Ridgeway Walk, local PRoW network and access land on elevated areas within the highly fragmented ZTV to the south-west of the Proposed Development.
19	Rhymney Valley Ridgeway Walk on Cefn y Brithdir	313068, 203596	Representative - recreational receptors	Representative of the long-distance views available to users of the Rhymney Valley Ridgeway Walk, local PRoW network and access land on Cefn Y Brithdir, to the west of New Tredegar, to the north-west of the Proposed Development.
20	Wales Coast Path, Newport	331082, 182776	Representative - recreational receptors	Located on the Wales Coast Path near West Usk Lighthouse at the confluence of the River Usk and Ebbw River, south of Newport. Representative of the long-distance views available to users of sections of the Wales Coast Path that fall within the preliminary blade tip ZTV

				to the south of the Proposed Development.
21	Summit of Mynydd Carn-y-Cefn	318714, 208498	Representative - recreational receptors	Representative of the long-distance views available to users of the local PRow network and access land on Mynydd Carn-y-Cefn and other elevated areas to the north of the Proposed Development.
22	Bertholey House, Newbridge on Usk	339542, 194489	Representative - residential & recreational receptors	Located on the Usk Valley Walk within Bertholey House Registered Historic Park and Garden, to the south-east of the Proposed Development. Representative of the long-distance views available to residents and those engaged in outdoor recreation in parts of the south-eastern quadrant of the LVIA study area within the blade tip ZTV.
23	The Bloreng	326986, 211842	Specific – recreational receptor	Long-distance view from this popular viewpoint within the BBNP and Blaenavon Industrial Landscape World Heritage Site, to the north of the Proposed Development.
24	Trig point at Mynydd Llangynidr, BBNP	314711, 215924	Representative - recreational receptors	Representative of the most elevated long-distance views available to users of the PRow network and open access land in parts of the BBNP within the preliminary ZTV, on the northern edge of the LVIA study area.

5.2.29. Consultees are requested to confirm the viewpoint selection or recommend additional/ alternative locations. Recommendations/ requests for the location of the 3 No. (three) night-time viewpoint locations are also welcomed.

5.2.30. Visualisations would be prepared for each viewpoint to accord with SNH guidance and include 90° (cylindrical projection) baseline photographs and wirelines, and 53.5° (planar projection) photomontages and wirelines.

Potential Receptors

5.2.31. Landscape and visual receptors within the LVIA Study Area most likely to be significantly affected tend to be those which are of higher sensitivity, located closest to the Proposed Development and incurring a direct and/ or higher magnitude of change or level of effect. Viewpoint analysis and site survey, which includes an assessment of sensitivity and magnitude, will be used as part of the assessment to identify those receptors which are most likely to be significantly affected.

Likely Significant Effects

5.2.32. The likely significant effects that will be taken forward for assessment in the Environmental Statement are summarised below:

- Direct landscape effects on host local landscape character in relation to construction and operation and indirect effects related to visibility of turbines in relation to:
 - National designations: related to special qualities and LCAs within BBNP;
 - Local landscape designations (SLAs, VILLs); and
 - LANDMAP Aspect areas.
- Effects on views and visual amenity resulting from visibility of the proposed site preparation and associated infrastructure construction activities within ~2km distance to include for views from tops of adjacent summits and ridgelines, subject to detailed viewpoint analysis.
- Effects on views and visual amenity resulting from visibility and movement of the proposed wind turbines within up to approximately 10km distance, subject review of ZTVs and detailed viewpoint analysis.

5.2.33. Landscape and visual receptors that would not be significantly affected in the context of the EIA Regulations as a result of the characteristics of the LVIA study area, the distribution of baseline receptors and the characteristics of the Proposed Development, are scoped out from further assessment in the ES. Landscape and visual receptors that are proposed to be scoped out from further assessment as follows:

- Cumulative Assessment:
 - Limit the cumulative baseline of all operational and consented wind energy development and other applications for wind energy development to within 24km of the Proposal Development Site;
 - Micro-generation turbines (25-50 m) that are located more than 5km from the boundary of the proposal site, with those within 5km only to be included if they consist of three or more turbines;
 - Single turbine wind energy developments that are located more than 10km from the boundary of the proposal site;
 - Scoping stage wind energy developments will be excluded unless they exhibit high potential to alter the landscape and visual baseline into which the Proposed Development would be introduced.
- All landscape and visual receptors within the LVIA Study Areas that are outwith the blade tip ZTV would have no view of the Proposed Development and are scoped out;
- Wye Valley Area of Outstanding Natural Beauty;
- Blaenavon Industrial Landscape World Heritage Site;
- Local/ regional receptors beyond 10km distance from the Proposed Development, subject to viewpoint analysis, should be scoped out. This would include local landscape designations, and all visual receptors. The field survey and the viewpoint analysis will be used to confirm whether a receptor can be scoped out. The viewpoint analysis will also be used to identify a conservative distance or 'threshold' for significant landscape and visual effects which will inform the inclusion or exclusion of receptors from the assessment;
- Local landscape designations that that are located beyond 10km and those that are substantially or completely outside the ZTVs; and
- All decommissioning activities.

ASSESSMENT METHODOLOGY

- 5.2.34. A summary of the proposed landscape, visual, Night-time Lighting Assessment and RVAA methodology is set out below with the full methodology in **Appendix A**.
- 5.2.35. The methodology for the LVIA would be undertaken in accordance with the Landscape Institute and IEMA Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA 3), and other best practice guidance.

Assessment of Landscape Effects

- 5.2.36. Landscape Effects are defined by the Landscape Institute in GLVIA 3, paragraphs 5.1 and 5.2 as follows:
- “An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner.”
- 5.2.37. The potential landscape effects occurring during the construction, operational and decommissioning periods may therefore include, but are not restricted to, the following:
- Changes to landscape elements: the addition of new elements (wind turbines) or the removal of existing elements such as trees, vegetation and buildings and other characteristic elements of the landscape character type;
 - Changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of landscape character types/ areas or contribute to the landscape value;
 - Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within a particular area;
 - Changes to designated landscapes: Including nationally and locally designated landscapes that would affect the special landscape qualities underpinning these areas and their integrity; and
 - Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.
- 5.2.38. Development may have a direct effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, outside the immediate site area and its associated landscape character/ designation. Landscape effects also have to be recognised in terms of natural and man-made processes which can change or alter the landscape over time.

Assessment of Visual Effects

- 5.2.39. Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity, and are defined by the Landscape Institute in GLVIA 3, paragraphs 6.1 as follows:
- “An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the

surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views.”

- 5.2.40. Visual effects are identified for different receptors (people) who would experience the view(s) at their places of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:
- Visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view(s); and
 - Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.
- 5.2.41. The level of visual effect (and whether this is significant) is determined through consideration of the sensitivity of each visual receptor (or range of sensitivities for receptor groups) and the magnitude of change that would be brought about by the construction, operation and decommissioning of the Proposed Development.

Cumulative Landscape and Visual Impact Assessment

- 5.2.42. The assessment of cumulative effects is essentially the same as for the assessment of the ‘solus’ landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. Cumulative assessment however considers the magnitude of change posed by multiple developments.
- 5.2.43. The cumulative assessment would accord with NS guidance (2021) and will be prepared to ensure that, as well as the effects of the Proposed Development (LVIA), the ‘additional’ cumulative effects and the ‘combined’ cumulative effects (CLVIA) are also reported to account for two cumulative Scenarios as follows:
- Proposed Development:
Assessed on an individual basis (the LVIA). This part of the assessment may take account of other existing forms of wind farm development that may be present in the landscape, whilst recognising that their influence on landscape character is likely to be time limited. It does not consider the additional or combined cumulative effects and only reports of the effect of the Proposed Development alone;
 - Scenario 1: Existing + Consented + the Proposed Development:
The additional and combined cumulative effects of the existing and consented wind energy developments with the Proposed Development will be assessed.
 - Scenario 2: Existing + Consented + Applications + the Proposed Development:
The additional and combined cumulative effects of the existing and consented wind energy developments and live applications (which would include schemes at planning appeal), with the Proposed Development will be assessed.
- 5.2.44. In addition, the cumulative assessment takes account of the timescales, as far as practicable, for the operation of the existing and consented developments and assumes that these will be decommissioned within the operational life of the Proposed Development.

Determining the Significance of Effects

- 5.2.45. The level of landscape and visual effect (and whether this is significant) is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change likely to be brought about by the proposed Rhyswg Wind Farm. The time limited period for the assessment would cover the construction of the wind farm and its operation for a period of 30 years. The assessment process would reflect any iterative design mitigation measures adopted to reduce or ‘design out’ landscape and visual impacts throughout the operation period.
- 5.2.46. In accordance with the relevant EIA Regulations, it is important to determine whether the predicted effects are likely to be significant. Significant landscape and visual effects are highlighted in bold in the text and in most cases, relate to all those effects that result in a ‘Substantial’ or a ‘Substantial / Moderate’ effect as indicated in Table 5-3. In some circumstances, ‘Moderate’ levels of effect also have the potential, subject to the assessor’s opinion, to be considered as significant and these exceptions are also highlighted in bold and explained as part of the assessment, where they occur.
- 5.2.47. The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

Table 5-3 - Evaluation of landscape and visual effects

		Landscape and Visual Sensitivity			
		High	Medium	Low	Very Low
Magnitude of Change	Very High	Major (Significant)	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)
	High	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Medium	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
	Zero	None / No View			

- 5.2.48. In line with the emphasis placed in GLVIA 3 upon application of professional judgement, the adoption of an overly mechanistic approach through reliance upon a matrix as presented in Table 5.3 will be avoided. This will be achieved by the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor over and above the outline assessment provided by use of the matrix. Matrices for landscape and visual effects will be provided as a summary in support of the narrative explanations.

Wherever possible cross references will be made to baseline figures and/or to photomontage visualisations to support the rationale.

Residential Visual Amenity Assessment

- 5.2.49. Residential amenity is a planning matter that involves a wide number of effects (such as noise and shadow flicker) and benefits, of which residential visual amenity is just one component. A Residential Visual Amenity Assessment (RVAA) will be undertaken to assess effects on residential visual amenity likely to be experienced at residential properties within 2km of the Proposed Site boundary. The RVAA will accord with the advice in GLVIA 3, the Landscape Institute's Residential Visual Amenity Assessment: Technical Guidance Note, 2019.
- 5.2.50. As a minimum, the visual effects on the views from each property/group of properties included in the assessment will be illustrated by a wireline visualisation.

Night-time Lighting Assessment

- 5.2.51. Aviation warning lights attached to turbine hubs and towers are required on all proposed wind turbines $\geq 150\text{m}$ in accordance with Article 222 of the UK Air Navigation Order (ANO) 2016, subject to any proposed lighting mitigation strategy. A proportionate Night-time Assessment of the proposed aviation lighting will be undertaken to accord with Nature Scot (NS) guidance⁵ and focussed on night-time visual effects. Night-time effects on landscape receptors are proposed to be scoped out. The assessment would be supported by maps indicating the ZTV of any proposed aviation warning lights and 3 No. (three) Night-time Viewpoints. However, in accordance with NS Guidance, all viewpoints will have the lit turbines noted on the wirelines.
- 5.2.52. A night-time ZTV of the turbine lighting positions would accompany the visualisations to aid the assessment which will be dependent on a Lighting Strategy to be agreed with the CAA. The extent of the night-time study area is likely to be restricted to 10-15km from the outer turbine positions according to the technical criteria of the proposed candidate light fixtures.

Assumptions

- 5.2.53. The LVIA scoping chapter has been drafted on the overarching assumption that a 'reasonable worst-case' scenario is adopted which accords with the approach required under GLVIA3. An example is the assumption that receptors present at the more distant viewpoints benefit from optimal weather conditions that would facilitate views be available for the required distance to the site. Similarly, it is assumed that PRoWs and Access Land identified on Ordnance Survey maps are present on the ground and/or can be readily accessed by recreational receptors (and the LVIA assessors).

⁵ NatureScot, General pre-application and scoping advice for onshore wind farms, September 2020. Available online: <https://www.nature.scot/sites/default/files/2020-10/General%20pre-application%20and%20scoping%20advice%20for%20onshore%20wind%20farms.pdf>

5.3 HISTORIC ENVIRONMENT

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.3.1. The historic environment chapter of the ES will consider the potential likely significant effects on heritage assets that may arise from the construction and operation and decommissioning of the Proposed Development, including cumulative impacts from other relevant developments in the area.
- 5.3.2. **Table 5-4** lists the planning policy that is relevant to the historic environment and sets out the implications for the scope of the EIA.

Table 5-4 - Relevant policies and the implications – historic environment

Policy	Policy context
National planning policy	
Future Wales: The National Plan 2040 (February 2021)	<p>Policy 18 – states that DNS scale renewable energy developments will be permitted provided there are no unacceptable adverse impacts on statutorily protected built heritage assets.</p> <p>Policy 35 – ‘Valleys Regional Park’ is relevant to south-east Wales. “The Welsh Government supports the establishment of the Valleys Regional Park. Strategic and Local Development Plans should embed its principles into their planning frameworks. The Welsh Government will work with local authorities, the third sector and key partners to support the Valleys Regional Park and maximise opportunities for new development.”</p> <p>“The Welsh Government, communities and partners have developed a positive framework through ‘Our Valleys, Our Future’ to drive change and regeneration. The Valleys Regional Park seeks to maximise the social, economic and environmental potential of the Valleys’ natural and cultural historic assets and it is important the planning system supports its delivery.”</p>
Planning Policy Wales, Edition 12	National planning policy for Wales is set out in Planning Policy Wales (Edition 12, 2024) (PPW). Chapter 6, ‘Distinctive and Natural Places’, explains how planning system must take into account the Welsh Government’s objectives to protect, conserve, promote and enhance the historic environment as a resource for the general well-being of present and future generations. It also sets out the planning policies for the sustainable management of specific categories of historic assets.
Local Planning Policy	
Caerphilly County Borough Council Local Development Plan	The historic environment is considered in Strategy Policy 6 of the Local Development Plan, Placemaking which states that development proposals should contribute to creating sustainable places by having full regard to the context of the local, natural, historic and built environment and its special features.

Legislation

- 5.3.3. Heritage assets that are deemed to be of particular importance are given legal protection through legislation. The primary legislation relating to the historic environment is:

- The Historic Environment (Wales) Act 2023 which provides for the protection of monuments, buildings and conservation areas. Although the legislation is now an Act of Senedd Cymru, it will not be brought into force until the latter part of 2024;
- Historic Environment (Wales) Act 2016 which made a number of amendments to the 1979 and 1990 Acts to address the needs of the Welsh historic environment;
- Planning (Listed Buildings and Conservation Areas) Act 1990 which covers the registration of listed buildings and designation of conservation areas; and
- Ancient Monuments and Archaeological Areas Act 1979.

Technical Guidance

5.3.4. The following technical guidance is considered to be relevant to the Historic Environment assessment:

- Technical Advice Note 24: The Historic Environment;
- Cadw Heritage Impact Assessment in Wales;
- Cadw Setting of Historic Assets in Wales;
- Cadw Managing Historic Character in Wales;
- ClfA Standard and Guidance for Historic Desk Based Assessment; and
- ClfA Standard and Guidance for Stewardship for the Historic Environment.

BASELINE

Data Sources

- 5.3.5. An initial desk-based assessment will be undertaken, comprising data from the regional Gwent and Glamorgan Archaeological Trust Environment Record (GGAT HER), the National Monument Record (NMR), and records held by Cadw, in order to determine the present baseline conditions. Data will be collected for a study area extending 1km from the site boundary for non-designated assets, and out to 10km for designated heritage assets as discussed further below. This study will be reappraised and expanded as part of the EIA process.
- 5.3.6. The data provided by the GGAT HER includes information on several different aspects of the historic environment including known surviving assets, records of former structures or sites found through documentary evidence and findspots of artefacts. Due to the range of data included within the GGAT HER these records must be considered not only for their historical value but also for their archaeological potential. Many former assets may have already been entirely removed; findspots may indicate former activity but are not, in themselves, evidence for buried archaeological remains. This consideration also takes into account any former archaeological events that may have occurred within the study area, for example archaeological monitoring or excavation, the data for which is also provided within the GGAT HER dataset at **Appendix B**.

Current Baseline

- 5.3.7. An initial search has been carried out using the Cadw online mapping search⁶, and has identified that there are no designated historic assets located within the site boundary. Ten listed buildings are within the 1km study area. These are shown in the table below:

Table 5-5 - Designated historic assets within the 1km study area

List Entry	Grade	Name
Listed Buildings		
1900	II	Rhyswg Fawr Farmhouse and walled forecourt
20998	II	Barn at Rhyswg Fawr
20995	II	Welsh Presbyterian Church
1903	II*	Church of St Luke
20996	II	Abercarn War Memorial
25737	II	The Gables
25738	II	Terraced steps at The Gables
20999	II	English Baptist Church and walled forecourt
21000	II	English Baptist Church Secondary School
20997	II	Cwmcarn War Memorial and surrounding railings

- 5.3.8. Between 1km and 5km from the site, there are 12 Scheduled Monuments, the closest being Charcoal Blast Furnace at Abercarn (reference number: MM250) and Former Dam of Cwmcarn Canal Reservoir (reference number: MM259). There are 5 Conservation Areas, the closest being Cwmcarn Memorial Park and Pontywaun Garden Suburbs. There are a number of Listed Buildings within 1km – 5km.
- 5.3.9. There are no Registered Park and Gardens, World Heritage Sites or Registered Historic Landscapes within 1km – 5km of the Site.
- 5.3.10. All designated historic assets within the 1-5km study area are set out in **Figure 5.3** and **Appendix C**.
- 5.3.11. There is one Registered Historic Landscape within 10km of the site, namely Gelli-Gaer Common, at a distance of c.8.6km from the site. Registered Historic Landscapes represent rare and important

⁶ <https://cadw.gov.wales/advice-support/cof-cymru/search-cadw-records>

historic landscapes and as such are included in the national Register of Landscapes of Historic Interest in Wales: Part 2:2: Landscapes of Special Historic Interest (2001).

Non-designated Historic Assets

- 5.3.12. There are two records of non-designated heritage assets located within the Eastern Parcel of land, and one within the Western Parcel, and these are listed in **Table 5-6**. There are a number of other HER core records and three events within a 1km study area (identified in **Appendix B** and shown in **Figure 5.4**) including GGAT02205g (Blaen Gotappy; Rhyswg Ganol – a post-medieval domestic house) which sits on the boundary of the Eastern Parcel.

Table 5-6 - Non-designated historic assets located within the site boundary

HER Ref	Name	Easting	Northing	Period	Type
GGAT12281g	Cefn-rhyswg Ridge	323300	194800	Unknown	Unassigned
GGAT05031g	Ruined Barn, Abercarn	323300	194800	Post Medieval	Barn
GGAT05030g	Ruined Barn, Abercarn	322200	194300	Post Medieval	Barn

THE SCOPE OF THE ASSESSMENT

Potential Receptors

The Proposed Development could affect the historic environment through:

- Direct disturbance of historic assets;
- Changes to the settings of historic assets, affecting their significance; and
- Changes to historic landscape.

Direct Disturbance

- 5.3.13. Any effects arising from direct disturbance to historic assets would be expected to occur during the construction phase and are permanent and irreversible but restricted to the footprint of the Proposed Development.
- 5.3.14. Direct disturbance would arise only from physical disturbance caused by the construction of the Proposed Development. Therefore, effects on known historic assets will be considered only where these are located within the footprint of the Proposed Development. Direct effects on historic assets outside the footprint of the Proposed Development will not occur and are scoped out.
- 5.3.15. There is a potential for previously unrecorded historic assets to be directly affected by the Proposed Development. Such effects will be considered with reference to a characterisation of the potential presence of such historic assets developed from an understanding of the historic landscape context, and reference to appropriate cartographic and documentary sources.

Effects on Setting

Changes to Setting

- 5.3.16. Cadw guidance identifies a staged approach to the assessment of effects on settings, with the first stage being the identification of the historic assets which may be affected. In accordance with guidance, this has been done with reference to the Zones of Theoretical Visibility (ZTV) and also considering:

- The location, size and scale of the proposed development; and
- The location of the identified historic assets.

5.3.17. On this basis, designated assets within 5km of the Site boundary which fall within the initial ZTV will be included in the assessment. At distances of 5-10km only the most sensitive and significant historic assets which fall within the initial ZTV have the potential to be significantly affected. Significant effects in these cases are only likely to occur where the proposed turbines will intervene in specific views that make a substantial contribution to the significance of an asset.

As a minimum, the EIA will include an assessment of effects on the settings of the following historic assets:

- Listed Buildings within 1km within ZTV;
- SAM within 5km within ZTV;
- Conservation Areas within 5km within ZTV.

Historic Landscape

5.3.18. The siting of the Proposed Development means there is potential to affect the setting of the Gelli-Gaer Common Registered Historic Landscape which is c.8.6km to the west of the Site and will be partially within the ZTV and as such will be considered within the assessment. The Blaenavon Registered Historic Landscape, c.10.6km to the north of the site, the Gwent Levels Registered Historic Landscape is c.10.8km to the south-east of the site, Merthyr Tydfil Registered Historic Landscape is approximately 16km to the north, and the Rhondda Registered Historic Landscape is approximately 18km to the south-west. At this distance they will not be considered within the assessment.

5.3.19. The Blaenavon Industrial Landscape World Heritage Site is c.11km to the north of the Site, outside of the ZTV, and will not be considered within the assessment.

Likely Significant Effects

5.3.20. The likely significant historic environment effects that will be taken forward for assessment in the Environmental Statement are summarised in **Table 5-7**.

Table 5-7 - Likely significant historic environment effects

Activity	Effect	Receptor
Construction: Site preparation and construction of associated infrastructure (tracks, control buildings / substations, contractors' facilities, site access and electrical cabling).	Direct disturbance to, or loss of, historic assets located within the development footprint.	Historic assets located within the site boundary, and any currently unidentified assets.
Construction and Operation: Turbine erection and operation.	Changes to the significance of assets through change to their settings.	Historic assets and historic landscape assets which fall within the ZTV as listed above.

5.3.21. The effects scoped out from further assessment in the Environmental Statement are:

- All other designated historic assets – it is considered that due to a combination of location, distance, intervening topography and the nature of the assets themselves, there are no other historic assets whose settings would be significantly affected by the Proposed Development.

5.3.22. Measures to avoid known assets, including any identified during the assessment, and to identify and record any assets where disturbance cannot be avoided, will be set out to ensure that adverse direct effects can be effectively mitigated.

ASSESSMENT METHODOLOGY

Direct Disturbance

5.3.23. An historic environment desk-based assessment will be undertaken, including a description of known historic assets and a discussion of the potential for further, as yet unknown, historic assets.

5.3.24. The desk-based study will include relevant records and sources of information held at the following repositories:

- Cadw, for designated asset data;
- The Glamorgan Gwent Archaeological Trust Historic Environment Record (GGAT HER);
- The National Monument Record (NMR), RCAHMW;
- The National Library of Wales; and
- Gwent Archives.

5.3.25. Relevant published sources and internet sources will also be consulted.

5.3.26. The assessment will identify the potential direct and indirect effects of the Proposed Development on historic assets. Information within a 500m study area will be used to inform the archaeological potential of the site. Indirect effects on designated assets will be considered primarily within 5km of the site boundary.

5.3.27. A final list of assets with the potential to be subject to indirect effects will be established with reference to calculated ZTVs, wireframe and photomontage visualisations as appropriate. Consultation will be held with Cadw to ensure that potential receptors and effects are appropriately assessed.

5.3.28. The assessment will determine the significance of historic assets within the Site boundary and the contribution of setting to that significance, in accordance with guidance provided by Cadw in The Setting of Historic Assets in Wales (2017) and Conservation Principles (2011).

5.3.29. The EIA will include a description of the research undertaken and results obtained, as well as an assessment of the nature and potential significance of the effects of the Proposed Development. Consideration will be given to any necessary mitigation, following consultation with the Applicant and consultees. All work will be completed in accordance with the Chartered Institute for Archaeologists (CIfA) Code of Conduct and Standard and Guidance for Archaeological Desk-Based Assessments.

Determining the Significance of Effects

5.3.30. The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are “likely to be significantly affected by the development”.

- 5.3.31. The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity or value of a receptor and the magnitude of the effect, as set out in Table 5-8. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.
- 5.3.32. For the purposes of assessing the significance of effects in EIA terms, heritage significance has also been assigned to one of four classes of value, with reference to the heritage interests described in Conservation Principles and relying on professional judgement as informed by policy and guidance. The hierarchy given in Table 5-9 reflects the TAN24 distinction between designated and non-designated heritage assets. TAN24 further distinguishes between designated assets of the highest heritage significance (i.e. scheduled monuments, protected wreck sites, Registered Battlefields, grade I and II* listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites) and other designated heritage assets. **Table 5-8** details the basis for assessing receptor value (heritage significance).

Table 5-8 - Establishing the heritage significance of assets

Heritage significance	Summary rationale	Examples
High	Asset has significance for an outstanding level of archaeological, architectural, historic and/or artistic interest.	All designated heritage assets or Non designated assets of demonstrably schedulable quality.
Medium	Asset has significance for a high level of archaeological, architectural, historic and/or artistic interest.	Locally listed buildings and buildings of merit. Regionally significant non-designated historic assets of archaeological interest.
Low	Asset has significance for elements of archaeological architectural, historic or artistic interest.	Locally significant historic assets of archaeological interest and important hedgerows.
Negligible	Due to its nature of form/condition/survival, cannot be considered as an asset in its own right.	Non-extant Historic Environment Record (HER) references

- 5.3.33. **Table 5-9** details the basis for assessing magnitude of change.

Table 5-9 - Establishing the magnitude of change

Magnitude	Criteria
High	Loss of significance of an order of magnitude that would result from total or substantial demolition/disturbance of a heritage asset or from the disassociation of an asset from its setting.

Medium	Loss of significance arising from partial disturbance or inappropriate alteration of asset which will adversely affect its importance. Change to the key characteristics of an asset's setting, which gives rise to harm to the significance of the asset but which still allows its archaeological, architectural or historic interest to be appreciated.
Low	Minor loss to or alteration of an asset which leaves its current significance largely intact. Minor and short-term changes to setting which do not affect the key characteristics and in which the historical context remains substantially intact.
Negligible	Minor alteration of an asset which does not affect its significance in any discernible way. Minor and short term or reversible change to setting which does not affect the significance of the asset.

5.3.34. The matrix in **Table 5-10** has been prepared to guide the assessment of whether effects on the historic environment for the purposes of EIA are considered to be significant or not. The classification of the effect is judged on the relationship of the magnitude of impact to the assessed heritage significance of the resource. As a general rule, major and moderate effects (shaded in table 6-5) are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is applied, where appropriate, to determine significance of effect.

Table 5-10 - Significance evaluation matrix

Heritage Significance of Receptor

		Negligible	Low	Medium	High
Magnitude	Negligible	Negligible	Negligible	Minor	Minor
	Low	Negligible	Minor	Minor	Moderate
	Medium	Minor	Minor	Moderate	Major
	High	Minor	Moderate	Major	Major

5.4 BIODIVERSITY

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.4.1. The following tables set out the relevant policy, legislation and guidance pertinent to the biodiversity assessment, and should be read in conjunction with that set out previously in Chapter 4 in relation to the EIA.
- 5.4.2. A summary of the relevant national and local planning policy is given in **Table 5-11**.

Table 5-11 - Planning Policy Relevant to the Biodiversity Assessment

Technical Guidance Document	Context
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National Planning Policy	
Future Wales: The National Plan 2040 ⁷	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 12, February 2024 - Chapter 6 Distinctive and Natural Places (12th Ed.; 2024) ⁸	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government’s objectives for Distinctive and Natural Places. Planning policy topics cover the historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks. This latest revision to PPW focuses on green infrastructure; net benefit for biodiversity and the step-wise approach; protection for Sites of Special Scientific Interest (SSSI); and trees and woodland. The revisions seek to clarify Wales’s intentional, diverging approach to Biodiversity Net Gain in respect of the Environment Act 2021, with a focus instead on ecosystem resilience.
PPW supplementary Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009) ⁹	Technical Advice Note 5 (TAN5) supplements 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	
Caerphilly County Borough Council (CCBC) Local Development Plan up to 2021 (Adopted November 2010) ¹⁰	Policies relating to biodiversity include Policy CW4 (Natural Heritage Protection), which states development proposals within, or in close proximity to sites designated as Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Regionally Important Geological Sites (RIGS), Green Corridors, or Local Priority Habitats and Species, where proposals either: i) conserve and where appropriate enhance the ecological or geological importance of the designation, or ii) are such that the need for the development outweighs the ecological importance of the site, and where harm is minimised by mitigation measures and offset as far as practicable by

⁷ Welsh Government (2021). Future Wales: The National Plan 2040. (Online). Available at: <https://gov.wales/future-wales-national-plan-2040>.

⁸ Welsh Government (2024) Planning Policy Wales, Edition 12, February 2024. (Online). Available at: https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf.

⁹ Welsh 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>.

¹⁰ CCBC (2010). Caerphilly County Borough Council Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx>

	<p>compensation measures designed to ensure that there is no reduction in the overall value of the area or feature.</p> <p>Of further pertinence is Policy CW5 (Protection of the Water Environment) whereby development proposals will only be permitted where: i) they do not have an unacceptable adverse impact upon the water environment, and ii) where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).</p> <p>Policy CW6 sets out the requirements in respect of trees, woodland and hedgerow protection whilst Policy NH3 sets out the specific SINC's requiring protection.</p>
CCBC Trees and Development SPG LDP 4 up to 2021 (Adopted January 2017) ¹¹	<p>Supplementary Planning Guidance prepared to give greater guidance on how the following policies will be implemented: i) SP10 Conservation of Natural Heritage; and ii) CW6 Trees, Woodland and Hedgerow Protection.</p> <p>LDP4 seeks to ensure that trees are adequately addressed throughout the development process by seeking the protection and integration of trees into the design of new development from an early stage in the development process.</p>
Caerphilly Biodiversity Partnership Biodiversity Action Plan (2002) Volume 1 ¹² and Volume 2 ¹³	<p>The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAP). CCBC 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 Caerphilly.</p>

5.4.3. A summary of the relevant legislation is given in **Table 5-12**.

Table 5-12 - Legislation Relevant to the Biodiversity Assessment

Technical Guidance Document	Context
The Conservation of Habitats and Species Regulations 2017 (as amended) ¹⁴	The Habitat Regulations transpose the Habitats Directive ¹⁵ into English and Welsh law. The regulations provide for the designation and protection of European sites, the protection of certain species (referred

¹¹Caerphilly County Borough Council (2017). Trees and Development Local Development Plan up to 2021.

Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/ldp4-trees-and-development.aspx>

¹²Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Overview and Habitat Statements Volume 1 Available at:

<https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx>

¹³Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Species Action Plans Volume 2. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx>

¹⁴UK 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).

¹⁵Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna, May 1992.

	to as European Protected Species or EPS) and the adaptation of planning and other controls for the protection of European sites
The Environment (Wales) Act 2016 ¹⁶	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 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) ¹⁷	This Act consolidates and amends existing national legislation to implement the Bern Convention ¹⁸ . This piece of legislation remains the primary UK mechanism for statutory site designations (e.g. 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 2000 ¹⁹	This act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.
The Hedgerows Regulations 1997 ²⁰	The Hedgerows Regulations is intended to protect important countryside hedges from damage or destruction.
Protection of Badgers Act 1992 ²¹	The Protection of Badgers Act provides protection to badgers and their places of shelter (setts).

5.4.4. A summary of the technical guidance for Biodiversity is given in **Table 5-13**.

Table 5-13 - Technical Guidance Relevant to the Biodiversity Assessment

Technical Guidance Document	Context
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¹⁶ UK Government (2016). The Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted>.

¹⁷UK Government (1981). The Wildlife and Countryside Act 1981 (as amended). (Online) Available at: <https://www.legislation.gov.uk/ukpga/1981/69/contents>.

¹⁸The 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>.

¹⁹UK Government (2000). Countryside and Rights of Way Act 2000. (Online) Available at: <https://www.legislation.gov.uk/ukpga/2000/37>.

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

²¹UK Government (1992). Protection of Badgers Act 1992. (Online) Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents>

<p>CIEEM (2022)²² Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (version 1.2 updated April 2022)²³</p>	<p>Provides practical advice for all professionals involved with ecological evaluation and assessment for proposed developments in terrestrial, freshwater, marine and coastal environments.</p>
<p>Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit; JNCC, Peterborough.²⁴</p>	<p>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.</p>
<p>Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd Edition)²⁵</p>	<p>A reference guide for ecological consultants working on bat surveys. This has now been superseded by Edition 4²⁶ but remained current at the time of survey. They are not a prescription for professional bat work and do not aim to override professional judgment and cannot be used to replace experience. Deviations from the methods described are acceptable providing professional rationale is clear and the ecologist is suitably qualified and experienced.</p>
<p>Bats and Onshore Wind Turbines: Survey Assessment and Mitigation.²⁷</p>	<p>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.</p>

²²The CIEEM guidelines were published in September 2018 and updated April 2022, hereafter referenced as CIEEM 2022.

²³CIEEM (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/>.

²⁴JNCC (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 September 2024).

²⁵Collins (ed.) (2016). Bat surveys for professional ecologists: Good practice guidelines. 3rd Edition.: Bat Conservation Trust; London.

²⁶Collins (ed.) (2023). Bat surveys for professional ecologists: Good practice guidelines. 4th Edition.: Bat Conservation Trust; London.

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>

Priority Habitats of Wales – A Technical Guide²⁸

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.

BASELINE

- 5.4.5. The biodiversity assessment will be based on industry-standard best-practice guidance including:
- Chartered Institute of Ecology and Environmental Management (CIEEM; 2022) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (version 1.2 updated April 2022) Edition [online];
 - Joint Nature Conservation Committee (2010) Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit; JNCC, Peterborough;
 - Collins J., (2016) Bat Surveys for Professional Ecologists. Good Practice Guidelines (3rd Edition). Bat Conservation Trust, London;
 - Scottish Natural Heritage (SNH), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and Bat Conservation Trust (BCT) (2021). Bats and Onshore Wind Turbines: Survey Assessment and Mitigation; and
 - Jones, P.S., Stevens, D.P., Blackstock, T.H., Burrows, C.R. and Howe, E.A. (2003) Priority Habitats of Wales - A Technical Guide.
- 5.4.6. Given the potential for the Proposed Development to affect biodiversity resources located off- as well as on-site, a desk study was undertaken in April 2020, and updated in April 2022 and August 2023 to obtain the following data:
- European protected sites within 30km of the Site boundary;
 - National Sites within 15km of the Site boundary;
 - Other statutory and non-statutory sites designated for their nature conservation interest within 5km of the Site boundary;
 - Protected and Priority²⁹ Species within 2km of the Site boundary; and
 - Records for Annex II³⁰ bats within 6km of the Site boundary.

Sources of desk study data returned are further detailed within **Table 5-14**.

²⁸Jones PS, Stevens DP, Blackstock TH, Burrows CR, Howe EA. 2003. Priority Habitats of Wales – a Technical Guide. Bangor: Countryside Council for Wales.

²⁹ Species considered of key significance to sustain and improve biodiversity in Wales, as defined under Section 7 of Part 1 of the Environment (Wales) Act 2016.

³⁰ Bat species listed in Annex II of the EC Habitats Directive, namely Greater horseshoe, Lesser horseshoe, Barbastelle and Bechstein's bats.

Table 5-14 - Sources of Desk Study Data

Data	Data Source
Statutory Biodiversity Sites	South East Wales Biological Records Centre (SEWBRcC); Natural Resources Wales (NRW); Multi-Agency Geographic Information for the Countryside (MAGIC).
Non-statutory Biodiversity Sites	SEWBRcC; MAGIC.
Ancient Woodland	SEWBRcC; NRW; MAGIC.
Records for Priority Species	SEWBRcC; Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales)
Ponds – (potential great crested newt (<i>Triturus cristatus</i>) Breeding Habitat	SEWBRcC; Aderyn; freely available Ordnance Survey mapping and satellite imagery.

Baseline Surveys

- 5.4.7. The ecological survey programme has been designed to provide sufficient information on legally protected and notable species, and the general status and condition of all habitats within the study area.
- 5.4.8. The study area comprises the land within and adjacent to the Site, as well as additional habitats outside the Site boundary that were included based on best practice guidance (e.g. ponds within 500m of the Site boundary), that could be impacted by the proposed development. The study areas were defined on a precautionary basis to ensure that the Zone of Influence (Zol) relevant to each ecological feature was covered during baseline data collection activities. The ecological features assessed and the study areas applied are further detailed in **Table 5-15** below. As the design process is iterative the study areas will be regularly reviewed to ensure that its extent is adequate to enable the assessment of likely significant effects on the ecological features identified. To date surveys have focused on the Eastern Parcel.
- 5.4.9. The survey data will provide the basis for a robust Ecological Impact Assessment (EclA) to be undertaken for the Proposed Development. **Table 5-15** provides further information on the survey programme:

Table 5-15 - Ecological Features and Survey Scope

Receptor/Survey	Scope of Survey
Desk Study	A desk study was previously completed April 2021 and updated April 2022 and August 2023, albeit limited to the Eastern Parcel. These desk studies requested information on statutory and non-statutory designated sites on or within the vicinity of the study area as follows: International designations within a 30km radius; national designations within a 15km radius; local designations within a 5km radius; bats within a 6km radius; and other protected and Priority Species within a 2km radius. The desk study findings will be subject to a further update prior to submission and will incorporate additional land comprising the Western Parcel. (Appendix D.1)

<p>Extended Phase 1 Survey</p>	<p>An Extended Phase 1 survey of the Eastern Parcel was completed on 30 June and 03 July 2020. All principal and Priority Habitat types and dominant plant species present therein were identified and mapped, with any actual or potential protected or priority species also identified and scoped, during the Extended Phase 1 survey (Appendix D.2). The survey findings will be subject to a further update prior to submission and will incorporate additional land comprising the Western Parcel.</p>
<p>Detailed Botanical Survey</p>	<p>Detailed botanical surveys of the Eastern Parcel were completed, following DAFOR³¹ methodology whereby each plant species was assessed for its frequency and abundance within the Site. The surveys were undertaken on 02 August 2021 and updated 22 August 2023. The survey findings will be subject to a further update prior to submission and will incorporate additional land comprising the Western Parcel.</p>
<p>Bats</p>	<p>To inform an assessment of potential effects arising upon a bat assemblage utilising the Site, the following survey effort has been completed during 2020, 2021 and 2023, limited to the Eastern Parcel:</p> <p>Bat Foraging/Commuting Activity:</p> <p>Manual transect surveys conducted at monthly intervals between June and October 2020;</p> <p>Manual transect surveys conducted in April, May and June 2021;</p> <p>Manual transect surveys conducted at monthly intervals between June and October 2023;</p> <p>Automated detector surveys conducted at monthly intervals between June and October 2020;</p> <p>Automated detector surveys conducted at monthly intervals between April and October 2021; and</p> <p>Automated detector surveys conducted at monthly intervals between June and October 2023; and</p> <p>Automated detector surveys conducted in August and September 2024.</p> <p>A weather station was also deployed onsite throughout the bat activity survey period to enable recordings of temperature, wind speed and direction, humidity, rainfall and atmospheric pressure to be taken on an hourly basis.</p> <p>In addition to the above, and to inform an assessment of potential effects arising upon bats potentially roosting onsite, the following outstanding surveys of both the Eastern and Western Parcels comprising the Site are pending completion:</p> <p>Automated detector surveys to be conducted at monthly intervals during the bat activity season across both the Eastern and Western Parcels;</p> <p>Ground level visual assessment of all mature trees located within a set buffer (50m buffer plus maximum turbine rotor blade radius) of each proposed turbine location;</p>

³¹ DAFOR botanical survey technique – whereby occurrence of a species is noted to be Dominant, Abundant, Frequent, Occasional, or Rare

	<p>Further detailed ground level and aerial tree inspections of potential roost features (PRF) identified following the initial ground assessment of all mature trees categorised as having moderate to high bat roosting potential;</p> <p>Ground level, visual building assessment of all built structures, where accessible, present within a set buffer (200m buffer plus maximum turbine rotor blade radius) of each proposed turbine location; and</p> <p>Dusk emergence surveys of built structures, where accessible and where assessed to have low to high bat roosting potential.</p>
Badger	<p>Evidence of badger (<i>Meles meles</i>) activity across the Eastern Parcel comprising the Site was initially sought for during the Extended Phase 1 survey on 30 March and 01 and 02 April 2020, and further updated through additional observations made on subsequent survey visits to the Site thereafter. During the survey, any signs of badger activity such as holes, latrines, trails, snuffle holes and hairs on fencing or vegetation were recorded. Update surveys will be undertaken prior to submission and will incorporate additional land comprising the Western Parcel.</p>
Dormouse	<p>Nest tube surveys were deployed across the Eastern Parcel comprising the Site in June 2020, and subject to repeat checks for the presence of dormouse (<i>Muscardinus avellanarius</i>) between July–November 2020 and April–November 2021. Given the absence of evidence recorded during the surveys, together with a lack of records returned for this species during the desk study searches completed to date, this species will likely be scoped out from further assessment. However, this will be dependent upon the findings of the update surveys and desk study proposed for completion prior to submission.</p>
Great crested newt	<p>Nine waterbodies (P1-P8 and P10) occur on or within 250m of the Site. A tenth pond (P9) is also situated just beyond 500m to the north-east of the Eastern Parcel comprising the Site.</p> <p>A habitat suitability assessment and water sampling exercise to test for great crested newt environmental DNA (eDNA) was undertaken on 25 June 2020 of ponds P1-P9. One pond (P5) tested positive for great crested newt. The remaining eight ponds either tested negative for great crested newt or were dry or inaccessible during the survey. Pond P10 was not subject to survey as the Western Parcel had not been included for assessment at the time of the survey.</p> <p>Due to the confirmation of great crested newt presence recorded for the pond P5 during 2020, an update eDNA survey was completed on 19 April 2021 of ponds P1-P8, reconfirming great crested newt presence for pond P5, in addition to confirming presence for pond P4. Great crested newt was otherwise not confirmed present for a further two ponds subject to eDNA testing (ponds P1 and P6), with all other ponds (P2, P3, P7 & P8) found to be dry or inaccessible.</p> <p>Further detailed surveys were also undertaken to determine population size in respect of the two ponds, P4 and P5, confirmed to support great crested newt. Detailed surveys employed standard techniques including bottle trapping, torching and egg searching, with a total of six survey visits undertaken between 30 April 2021 and 15 June 2021. The surveys confirmed the presence of a small breeding population of great crested newt associated with pond P4. No evidence of great crested newt was recorded in association with pond P5.</p> <p>Update eDNA surveys completed of ponds P1-P8 on 14 June 2023 reconfirmed presence of great crested newt within pond P5 in addition to a pond within the Site itself, P1, which had previously tested negative during the 2020 and 2021 eDNA sampling onsite. No evidence of great crested newt eDNA was recorded for the pond P4, however. Remaining ponds tested negative (p6) or were inaccessible or dry at the time of the 2023 eDNA survey (P2, P3, P7, and P8).</p>

	<p>Further update surveys of ponds potentially impacted will be required prior to submission. Such surveys will also consider additional land comprising the Western Parcel, within which at least one additional pond has been identified through OS mapping/aerial photography.</p> <p>(See Appendix D.3).</p>
Reptiles	<p>Reptile surveys have been scoped out, with presence assumed for common lizard (<i>Zootropa vivipara</i>), slow-worm (<i>Anguis fragilis</i>) and grass snake (<i>Natrix helvetica</i>). The adoption of a precautionary approach to mitigation during construction will be taken, to ensure the avoidance of impacts upon common reptiles. This is considered appropriate given the extent of suitable habitats present across the study area and beyond, relative to the limited and localised nature of physical impacts upon reptile habitat arising from the proposed development.</p>

THE SCOPE OF THE ASSESSMENT

Potential Ecological Features

- 5.4.10. The starting point for defining which ecological features will be taken forward to the detailed assessment stage will be to use the baseline data collected through the desk study and field surveys to determine which of the identified ecological features are 'important' at the level of the project. Following CIEEM (2022) guidance, the importance of ecological features will be determined using a geographic scale and described in relation to UK legislation and policy, and with regard to the extent of habitat or size of population that may be affected by the Proposed Development.
- 5.4.11. The importance of ecological features can therefore differ from that which would be conferred solely by legislative protection or identification as a conservation notable species. For example, a small length of hedgerow (a Section 7 habitat), even if deemed to be 'important' with regard to the Hedgerow Regulations, is unlikely to be considered to have greater than 'local' importance due to the extent of this habitat type across a given county.
- 5.4.12. Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features will be used to inform the categorisation and determine importance at the project level. Where detailed criteria or contextual data are not available, professional judgement will be used to determine importance. A justification of all determinations of importance are provided in **Table 5-16**.

Table 5-16 - Importance of the Proposed Development for Ecological Features

Geographic Context of Importance	Description
International or European	<p>European sites including Special Protection Areas (SPA), Special Areas of Conservation (SAC), candidate SACs and Sites of Community Importance (SCI). Potential SPAs (pSPA), and Ramsar sites (designated under international convention); and</p> <p>Areas of habitat or populations of species which meet the published selection criteria based on discussions with Natural Resources Wales and field data collected to inform the EclA for designation as a European site, but which are not themselves currently designated at this level.</p>

National (UK context)	<p>A nationally designated site including SSSI and National Nature Reserves (NNR);</p> <p>Areas (and the populations of species which inhabit them) which meet the published selection criteria guidelines for selection of biological SSSIs but which are not themselves designated based on field data collected to inform the EclA, and in agreement with NRW;</p> <p>Section 7 habitats and species, Red listed and legally protected species that are not addressed directly in Part 2 of the 'Guidelines for Selection of Biological SSSIs' but can be determined to be of national importance using the principles described in Part 1 of the guidance; and</p> <p>Areas of Ancient Woodland e.g. woodland listed within the Ancient Woodland Inventory and ancient and veteran trees.</p>
Wales National/UK Regional	<p>Regularly occurring Section 7 habitats or populations of Section 7 species, Red listed and legally protected species may be of regional (Wales) importance in the context of published information on population size and distribution.</p>
County (CCBC)	<p>LNRs and Non-statutory Designated sites including: SINCs of County Importance; and</p> <p>Areas which based on field data collected to inform the EclA meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant LBAP) but which are not themselves designated.</p>
Local	<p>Section 7 habitats and species, Red listed and legally protected species that based on their extent, population size, quality etc. are determined to be at a lesser level of importance than the geographic contexts above;</p> <p>Common and widespread semi-natural habitats occurring within the study area in proportions greater than may be expected in the local context; and</p> <p>Common and widespread native species occurring within the study area in numbers greater than may be expected in the local context.</p>
Negligible	<p>Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area; and</p> <p>Areas of heavily modified or managed land uses (e.g. hard standing used for car parking, as roads etc.)</p>

5.4.13. Where protected species are present and there is the potential for a breach of the legislation, those species will be considered as 'important' features. With the exception of such species receiving specific legal protection, or those subject to legal control (e.g. invasive species), all ecological features determined to be important at the negligible level will be scoped out of the assessment. Further ecological features of local importance, where justified, will also be scoped out. This is because effects on them would not influence the decision-making about whether or not consent should be granted for the development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM 2022. All legally protected species and ecological features that are of sufficient importance will then be taken through to the next stage of the scoping assessment.

Potential Ecological Features Scoped into the Assessment

- 5.4.14. Subject to the findings of ongoing survey and analysis work and further refinement of the Proposed Development, designations, habitats and species identified to date as requiring assessment within the ES, due to their identification as potential ecological features valued at or above Local level are summarised in **Table 5-17**.

Table 5-17 - Potential Ecological Features Requiring Consideration

Geographic Context of Importance	Description
International or European	N/A
National	N/A
County (CCBC)	<p>Cwm Gofapi Woods, Cwmcarn SINC – Overlaps/abuts the southern edges of the Site. Supports semi-natural woodland, replanted woodland and grassland habitat with a high density of ant hills;</p> <p>Gwydon Valley Woodlands, Abercarn SINC – Abuts northern boundaries. Large area of forestry plantation on the site of former ancient woodland, with acid grassland supported;</p> <p>Mynydd Maen, East of Newbridge SINC – Abuts north-eastern boundaries. Comprises a large upland common with extensive areas of acid grassland, heath and bracken with a number of indicator species;</p> <p>Coed Fford-Fawr, Abercarn SINC – c.0.7km north-west of the Site at its closest point. Supporting semi-natural woodland with an assemblage of indicator species;</p> <p>Distillery pond, Abercarn SINC – c.0.4km north west of the Site at its closest point. A pond on the Nant Gwyddon stream held back by a dam on its western side, its pond margins supporting a range of wetland species;</p> <p>Cwmcarn Slopes, Cwmcarn SINC – c.0.5km south of the Site at its closest point. Supporting heathland, acid grassland and replanted woodland; and</p> <p>Cwm Hafod-Fach Woodlands, North of Abercarn SINC – c.0.92km north-west of the Site at its closest point. An area of mixed woodland on sloping valley-sides surrounding a working quarry. Most of the woodland is classed as semi-natural or cleared/replanted ancient woodland. Acid grassland and heath also supported.</p>
Local	<p>Treelines and hedgerows – Priority Habitat. Where present, hedgerows are predominantly defunct and species-poor. Field boundaries across agricultural land are mostly defined by lines of semi-mature and mature trees dominated by beech (<i>Fagus sylvatica</i>);</p> <p>Unimproved and semi-improved acid grassland – Priority Habitat and relatively diverse, though subject to significant bracken (<i>Pteridium aquilinum</i>) and scrub encroachment;</p> <p>Aquatic features – Priority Habitat. Circa 10 waterbodies are associated with the Site;</p> <p>Commuting and foraging bat assemblage typically dominated by common and generalist species including common pipistrelle (<i>Pipistrellus pipistrellus</i>), soprano pipistrelle (<i>Pipistrellus pygmaeus</i>), long-eared bat (<i>Plecotus sp.</i>), <i>Myotis</i> bat</p>

	<p>species and serotine (<i>Eptesicus serotinus</i>) bat recorded foraging and commuting across the Eastern Parcel comprising the Site (data analysis incomplete at the time of writing);</p> <p>Roosting bats – Numerous trees and some built structures associated with the Site with potential to support roosting bats;</p> <p>Great crested newt – Three ponds located on or immediately adjacent to the Site confirmed to support great crested newt; a further six ponds situated on or within 250m of the Site with potential to support this species in future;</p> <p>Common reptiles – Presence of a common reptile population assumed based on local records and habitat suitability; and</p> <p>Badger – evidence of this species recorded for the Site.</p>
Negligible	<p>All other international, national and local designated sites;</p> <p>All other notable and Priority Habitats; and</p> <p>All other protected, notable and Priority Species.</p>

Potential Ecological Features Scoped Out of the Assessment

- 5.4.15. International designations occurring within c.30km of the Site include: Aberbargoed Grasslands SAC, designated for Molina meadows and marsh fritillary (*Euphydryas aurinia*) (c.7.1km to the north-west of the Site); River Usk SAC, designated for its important fish populations (c.8.3 km south-east); Cardiff Beech Woods SAC designated for its beech woodland (c.12.2km south-west); Severn Estuary SAC/SPA/Ramsar designated for its habitats and migratory bird populations (c.12.5km south); Usk Bat Sites SAC designated for its lesser horseshoe (*Rhinolophus hipposideros*) population (c.16.3km north); Cwm Clydach Woodlands SAC designated for its beech woodland (c.16.9km north); Sugar Loaf Woodlands SAC designated for its oak (*Quercus* sp.) and beech woodland (c.21.6km north); Wye Valley and Forest of Dean Bat Sites, designated for its lesser horseshoe and greater horseshoe (*Rhinolophus ferrumequinum*) bat populations (c.23.7km east); Blaen Cynon designated for its large metapopulation of marsh fritillary (c.28.8km north-west); Coed y Cerrig SAC, designated for its alluvial forests (c.29.6km from the Site, north); Cwm Cadlan, designated for Molinia meadows and alkaline fens (c.29.4km north-west); Wye Valley Woodlands, designated for its beech forests, Tilio-Acerion forest and yew (*Taxus baccata*) woods (c.28.2km north-east); and River Wye, designated for its vegetated watercourses and a number of Annex II species including white-clawed crayfish (*Austropotamobius pallipes*), otter (*Lutra lutra*) and fish species (c.28.5km east). In consideration of the distance, spatial separation and/or lack of direct impact pathways between these designated sites and the Proposed Development, no likely significant effects upon the integrity of these designations or their qualifying features are considered to arise as a result of the Proposed Development.
- 5.4.16. In respect of national designations, 24 SSSIs (also encompassing NNRs and LNRs) occur within c. 15km of the Site. Those within 5km of the Site boundaries include: Ty'r Hen Forwyn SSSI notified for its species-rich neutral grassland (c.4.5km to the north of the Site); Memorial Park Meadows Pontllanfraith SSSI notified for unimproved grassland (c.4.5km north-west); and Henllys Bog SSSI notified for its fen habitat (c.2.9km south-east). None would be potentially directly or indirectly impacted by the Proposed Development due to their spatial separation from the Site and in consideration of their interest features and/or lack of impact pathways. National sites have therefore been scoped out of the assessment accordingly.

- 5.4.17. Regarding non-statutory designated sites (SINCs), those overlapping with or occurring immediately adjacent have been scoped into the assessment, as listed in Table 5.X above. All other SINCs have been scoped out of the assessment given their distance from the Proposed Development and in consideration of those interest features supported and/or lack of impact pathways.
- 5.4.18. In respect of species, based on desk study and field data collated thus far during the 2020, 2021 and 2023 surveys, albeit specific to the Eastern Parcel comprising the Site, and in consideration of the limited suitability of habitats supported by the study area, it has been assessed that dormouse, otter and water vole (*Arvicola amphibius*) can be scoped out as potential ecological features requiring further assessment as part of the EclA.
- 5.4.19. With respect to dormouse, records returned during the desk study searches undertaken to date include one record from 1993 located c.400m to the north of the Site, and a more recent record from 2022 located c.5km to the north of the Site. However no evidence of dormouse was recorded throughout the nest tube surveys undertaken across the Site during 2020 and 2021. With respect to otter, several records were returned in association with the River Ebbw, the closest record relating to a live sighting in 2021, c.1.4km west of the Site. No records were returned for water vole, however. Overall, habitats onsite are considered sub-optimal for otter and water vole, with an absence of suitable watercourses necessary to facilitate their dispersal across the wider landscape. Whilst a very small stream arises at its far eastern end, this remained dry throughout the habitat surveys, likely holding water during periods of heavy rainfall only, and flowing south-west off site via a wooded valley, before discharging into Nant Carn situated c.1.5km south of the Site.
- 5.4.20. However, further assessment will also need to be undertaken for additional potential impacts arising from the Proposed Development in respect to aspects of development design which have yet to be defined, such as: access routes; additional ancillary development; and in respect of the proposed construction programme.

Likely Significant Effects

- 5.4.21. In accordance with the EIA Regulations 2017, the EIA for the Proposed Development will consider those impacts where there is a risk of a likely significant effect only. The following section draws on industry experience and expertise to identify those effect-receptor pathways that may potentially lead to a significant effect.
- 5.4.22. **Table 5-18** outlines the ecological features affected, potential environmental changes and broad effects resulting from the Proposed Development being considered within this scoping assessment, to be taken forward for consideration in the EclA.

Table 5-18 - Likely Biodiversity Effects Requiring Assessment

Activity	Effect	Ecological Features
Construction		
Permanent or temporary land-take/changes to habitats	Degradation and/or loss of habitat (including through soil compaction).	Terrestrial habitats. Terrestrial fauna including bats, great crested newt, common reptiles and badger.

		Designated features of Cwm Gofapi Woods, Cwmcarn SINC, Mynydd Maen, East of Newbridge SINC and Gwydon Valley Woodlands, Abercarn SINC.
Use of temporary lighting for security purposes or to illuminate construction working areas	<p>Disturbance and displacement of fauna sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites.</p> <p>Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates.</p> <p>Loss of ecological connectivity through severance (due to introduction of light) of habitats resulting in fragmentation</p>	<p>Bats (various species).</p> <p>Great crested newt.</p> <p>Badger.</p>
Production of aural and visual stimuli and vibration from construction activities such as vehicular movements, piling or site personnel	Disturbance and displacement of species susceptible to noise/visual disturbance resulting in a reduction of energy intake and/or an increase in energy expenditure potentially leading to a reduction in survival and productivity rates.	<p>Bats (various species).</p> <p>Badger.</p>
Temporary hydrological changes (changes to sub-surface and surface water flows)	Changes to local hydrology resulting in changes or loss of surrounding habitats with subsequent effects on the fauna they support.	<p>Terrestrial and freshwater habitats.</p> <p>Fauna including great crested newt and bats.</p> <p>Features of sites designated for nature conservation.</p>
Creation of airborne particles (e.g. dust) during construction activities and vehicle movements	<p>Loss or damage of sensitive flora through dust deposition resulting in effects on habitat composition and the fauna that it supports.</p> <p>Deposition of dust resulting in enrichment of sensitive Priority Habitats, including those contained within statutory designated sites, leading to alteration of flora through changes in baseline conditions and the species which they support.</p> <p>Direct effects on invertebrates through ingestion or direct deposition on sedentary species.</p>	<p>Terrestrial and freshwater habitats (and supported fauna).</p> <p>Features of sites designated for nature conservation.</p>

Contamination of site run-off	The introduction of toxic pollutants or sediments into the environment resulting in changes, loss or damage to terrestrial or freshwater environments and the fauna they support.	Terrestrial and freshwater habitats. Fauna within freshwater habitats, including great crested newt. Features of sites designated for nature conservation.
Increase in vehicle movements and changes in movement patterns and timings during construction activities	Potential killing or injury of fauna through road traffic collisions.	Bats (various species). Great crested newt. Common reptiles. Badger.
Operation		
Physical changes to the spatial environment	Potential killing or injury to fauna in flight, through direct collision with moving turbine blades or barotrauma.	Bats (various species).
Vehicle movements	Potential killing or injury of fauna through road traffic collisions.	Bats (various species).
Temporary hydrological changes (changes to sub-surface and surface water flows)	Changes to local hydrology resulting in changes or loss of surrounding habitats with subsequent effects on the fauna they support.	Terrestrial and freshwater habitats. Fauna within freshwater habitats, including great crested newt. Features of sites designated for nature conservation.
Use of lighting for security or aviation safety purposes	Disturbance and displacement of fauna sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites. Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates. Loss of ecological connectivity through severance (due to introduction of light) of habitats resulting in fragmentation.	Bats (various species). Great crested newt. Badger.
Decommissioning		
As per construction phase		

ASSESSMENT METHODOLOGY

- 5.4.23. The generic project-wide approach to the assessment methodology is set out in Chapter 4. This methodology will be applied, and adapted as appropriate, to address the specific needs of the biodiversity assessment.
- 5.4.24. The evaluation of Important Ecological Features (IEF) 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

- 5.4.25. 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 (Caerphilly); and
 - Local (considered as the 2km Study Area around the Survey Boundary).

Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Species and Habitats

- 5.4.26. 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

- 5.4.27. CIEEM guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the Zol 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 consideration of 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 Zol during the lifetime of the development.

5.4.28. When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters:

- Positive or Negative - whether the change is in accordance with the nature conservation objectives and policy (whereby a positive impact is one that improves the quality of the environment, a negative impact being one that reduces it);
- Extent - the spatial or geographical area over which the environmental change may occur;
- Magnitude - the size, amount, intensity or volume of the environmental change;
- Duration - the length of time over which the environmental change may occur;
- Frequency - the number of times the environmental change may occur;
- Timing - the periods of the day/year etc. during which an environmental change may occur; and
- Reversibility - whether the environmental change can be reversed through restoration actions.

Significance Criteria

- 5.4.29. The guidance defines an ecologically significant impact as an “effect that either supports or undermines biodiversity conservation objectives for 'IEFs' or for biodiversity in general”. Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential ecological feature, 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.
- 5.4.30. Although certain species and habitats may not constitute potential ecological features based upon their nature conservation value, they may still warrant consideration during the design and mitigation of the Proposed Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.
- 5.4.31. The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.
- 5.4.32. 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.
- 5.4.33. The significance of the potential impacts upon potential ecological features will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the Proposed Development. Consideration will also be given to the potential future impacts to IEFs arising as a result of global trends and climate change.
- 5.4.34. Additionally, and in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended), screening may 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 Proposed Development and, if this is the case, for an appropriate assessment to be

undertaken. Whilst the Habitats Regulations Assessment (HRA) is the responsibility of the Competent Authority, information to inform this process will be prepared.

Cumulative and In-combination Effects

- 5.4.35. The EclA will give due consideration to potential in-combination or cumulative effects resulting from other development proposals within the Zol. In respect of potential ecological features, consideration will be given to such developments within the same range of mobile species (e.g. bats) or shared hydrological catchment. In respect of developments to be included within the cumulative assessment, this will include: schemes which are operational or under construction; schemes which have been granted planning permission but are not yet constructed/operational; and proposals for which consent has been applied but which await determination (including those subject to determination at appeal). Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain, and/or in respect of potential development relating to pre-assessed areas defined within Future Wales: The National Plan 2040.

Approach to Mitigation and Compensation

- 5.4.36. The mitigation hierarchy and step-wise approach will be adopted, following the sequential process of avoidance, minimisation, mitigation and compensation. Inherent in the design of the Development will be the avoidance of impacts upon potential ecological features as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure. Where such impacts cannot be altogether avoided, however, mitigation will be implemented to ensure such impacts are reduced as far as possible so as to minimise harm upon potential ecological features. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been taken into account. Additionally, enhancement measures will also be implemented so as to ensure overall net benefit to biodiversity are achieved. Such enhancements would be proposed following consultation with relevant stakeholders to ensure that any measures proposed were compatible with ongoing management of the Site.
- 5.4.37. Avoidance, minimisation, mitigation, compensation and enhancement measures to be implemented as part of the Proposed Development will be informed by those ongoing ecological field surveys of the study area, as detailed previously above, alongside further consideration of the development proposals as they evolve. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Method Statement detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a habitat management plan detailing those management, maintenance and monitoring measures requiring delivery over the lifetime of the Proposed Development.

5.5 ORNITHOLOGY

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.5.1. The policy and legislation relevant to ornithology is detailed in Table X.X. Further information on policies relevant to the EIA and their status is set out in Section3, which should be read in conjunction with this chapter.

Table 5-19 - Planning Policy Relevant to the Biodiversity Assessment

Technical Guidance Document	Context
National Planning Policy	
Future Wales: The National Plan 2040 ³²	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 12 February 2024 ³³ - Chapter 6 Distinctive and Natural Places.	Chapter 6 of Planning Policy Wales (PPW) sets out the Welsh Government’s objectives for Distinctive and Natural Places. Planning policy topics cover the historic environment, landscape, biodiversity and habitats, coastal characteristics, air quality, soundscape, water services, flooding and other environmental (surface and sub-surface) risks. This latest revision focuses on green infrastructure; net benefit for biodiversity and the step-wise approach; protection for Sites of Special Scientific Interest (SSSI); and trees and woodland. The revisions seek to clarify Wales’ intentional, diverging approach to Biodiversity Net Gain in respect of the Environment Act 2021, with a focus instead on ecosystem resilience.
PPW supplementary Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009) ³⁴	Technical Advice Note 5 (TAN5) supplements 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	
Caerphilly County Borough Council (CCBC) Local Development Plan up to 2021 (Adopted November 2010) ³⁵	Policies relating to biodiversity include Policy CW4 (Natural Heritage Protection) which states development proposals within, or in close proximity to sites designated as Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR), Regionally Important Geological Sites (RIGS), Green Corridors, or Local Priority Habitats and Species, where proposals either: i) Conserve and where appropriate enhance the ecological or geological importance of the designation; or ii) Are such that the need for the development outweighs the ecological importance of the site, and where harm is

³² Welsh Government (2021). Future Wales: The National Plan 2040. (Online). Available at: <https://gov.wales/future-wales-national-plan-2040> (Accessed 05 December 2023).

³³ Welsh Government (2024) Planning Policy Wales, Edition 12, February 2024. (Online). Available at: <https://gov.wales/planning-policy-wales> (Accessed 10 September 2024).

³⁴ Welsh 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 09 September 2024).

³⁵ CCBC (2010). Caerphilly County Borough Council Local Development Plan up to 2021. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx> [Accessed on 09 September 2024]

	<p>minimised by mitigation measures and offset as far as practicable by compensation measures designed to ensure that there is no reduction in the overall value of the area or feature.</p> <p>Of further pertinence is Policy CW5 (Protection of the Water Environment) whereby development proposals will only be permitted where: i) They do not have an unacceptable adverse impact upon the water environment, and ii) Where they would not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water).</p> <p>Policy CW6 sets out the requirements in respect of trees, woodland and hedgerow protection whilst Policy NH3 sets out the specific SINC's requiring protection.</p>
Caerphilly Biodiversity Partnership Biodiversity Action Plan (2002) Volume 1 ³⁶ and Volume 2 ³⁷	The national strategy for biodiversity is delivered at local level via Local Biodiversity Action Plans (LBAP). CCBC 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 Caerphilly.

5.5.2. A summary of the relevant legislation is given in **Table 5-20**.

Table 5-20 - Legislation Relevant to the Biodiversity Assessment

Technical Guidance Document	Context
The Conservation of Habitats and Species Regulations 2017 (as amended) ³⁸	The Habitat Regulations transpose the Habitats Directive ³⁹ into English and Welsh law. 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.
The Environment (Wales) Act 2016 ⁴⁰	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

³⁶Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Overview and Habitat Statements Volume 1 Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx> [Accessed on 09 September 2024]

³⁷Caerphilly Biodiversity Partnership (2002). Biodiversity Action Plan for Caerphilly Borough Council. Species Action Plans Volume 2. Available at: <https://www.caerphilly.gov.uk/caerphillydocs/planning/biodiversity-action-plan-caerphilly-county-borough.aspx> [Accessed on 09 September 2024]

³⁸UK 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).

³⁹Council Directive 92/43/EEC on the Conservation of natural habitats and wild flora and fauna, May 1992.

⁴⁰ UK Government (2016). The Environment (Wales) Act 2016. (Online). Available at: <https://www.legislation.gov.uk/anaw/2016/3/contents/enacted> (Accessed 09 September 2024).

	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) ⁴¹	This act consolidates and amends existing national legislation to implement the Bern Convention ⁴² . This piece of legislation remains the primary UK mechanism for statutory site designations (e.g., 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 2000 ⁴³	This act details further measures for the management and protection of SSSIs and strengthens wildlife enforcement legislation.

5.5.3. The ornithology assessment in the EIA will be based on industry-standard best-practice guidance including:

- CIEEM (2022)⁴⁴ Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (version 1.2 updated April 2022) Edition [online];
- Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2 (Scottish Natural Heritage 2017);
- Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action (SNH 2000);
- Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model (SNH 2018 v2);
- Assessing Significance of Impacts from Onshore Windfarms on Birds outwith Designated Areas (SNH 2006);
- Assessing the cumulative impacts of windfarms (SNH 2012);
- Band et al (2007) Developing Field and analytical methods to assess avian collision risk at windfarms. Birds and Wind Farms: Risk Assessment and Mitigation, pp 259-275. Quercus Madrid;
- Hardy et al (2013) Raptors: a field guide to survey and monitoring, 3rd edition;
- Gilbert et al (1998) Bird monitoring methods;
- Bibby et al (2000) Bird census and survey techniques;
- Barn Owl Trust (2012) Barn Owl Conservation Handbook;

⁴¹UK Government (1981). The Wildlife and Countryside Act 1981 (as amended). (Online) Available at: <https://www.legislation.gov.uk/ukpga/1981/69/contents> (Accessed 09 September 2024).

⁴²The 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 09 September 2024).

⁴³UK Government (2000). Countryside and Rights of Way Act 2000. (Online) Available at: <https://www.legislation.gov.uk/ukpga/2000/37> (Accessed 09 September 2024).

⁴⁴ The CIEEM guidelines were published in September 2018 and updated April 2022, hereafter referenced as CIEEM 2022. Available at: <https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/> (Accessed 09 September 2024).

- Hötker et al (2006): Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institute in NABU, Bergenhusen;
- Pearce-Higgins et al (2009) The distribution of breeding birds around upland wind farms. *Journal of Applied Ecology* 46: pp 1323-1331;
- Douglas et al (2011) Changes in the abundance and distribution of upland breeding birds at an operational wind farm. *Bird Study* 58: 37–43;
- Goodship, N.M. and Furness, R.W. (MacArthur Green) (2022) Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. NatureScot Research Report 1283;
- Pearce-Higgins et al (2012). Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. *Journal of Applied Ecology* 49: 386-394; and
- Band et al (2007) Developing field and analytical methods to assess avian collision risk at wind farms. *Birds and Wind Farms*. Quercus, Madrid. 259-275.

BASELINE

EXTENT OF THE STUDY AREA

- 5.5.4. Given the mobile nature of birds, the ornithology field surveys undertaken to inform the assessment cover the Site and wider study area as applicable to the potential Zone of Influence (Zol) of the Proposed Development to target species or species-groups, with reference to best practice guidance. For example, in respect of moorland birds and raptors, the wider study area has included a survey buffer extending circa 800m and 2,000m from the Site respectively.
- 5.5.5. To date, the desk and field study areas have been derived from buffers from the Eastern Parcel, with the Western Parcel having been added to the Site in summer 2024.
- 5.5.6. These field study areas, alongside the wider desk study search radius, reflect the sensitivity and value of potential ornithology receptors and are considered to be sufficient to cover the potential Zol of the Proposed Development on these receptors, while providing contextual information to assist with determining and evaluating the baseline.

Target Species

- 5.5.7. The existing ornithology information for the Site and current baseline has been informed by the desk study and a suite of ornithology field surveys, which commenced in March 2020 and are ongoing in 2023.
- 5.5.8. With reference to best practice guidance, the surveys and subsequent assessment will focus on species drawn from the following four lists:
- EU Birds Directive (79/409/EEC);
 - Wildlife and Countryside Act (1981);
 - Red-listed and amber-listed Birds of Conservation Concern in Wales 4: the population status of birds in Wales (2022); and

- Priority Species under Section 7 of The Environment (Wales) Act (2016)⁴⁵.

- 5.5.9. Species contained within these lists that by virtue of their breeding, roosting, feeding or migrating behaviour that may be sensitive to the Proposed Development will be identified as target species for assessment purposes. Consideration will also be given to species identified locally as of conservation concern within the Gwent Bird Report (2019).
- 5.5.10. With reference to best practice guidance, conservation concern passerine species (e.g. skylark and meadow pipit) have been scoped out as target species to be assessed within the Ornithology Impact Assessment (OIA), except where significant habitat loss/disturbance impacts could potentially arise during vegetation clearance, construction and decommissioning. This is because such species are generally not considered to be at risk of impacts from the operational turbines.
- 5.5.11. With regards to target species, it is proposed that buzzard, sparrowhawk and raven are scoped out of the baseline recording and future collision risk analysis due to their lack of conservation status, as reflected by their common and widespread distribution.

Desk Study

- 5.5.12. Given the potential for the Proposed Development to affect biodiversity resources located off- as well as on-site, a desk study was undertaken in April 2020 and updated in April 2022 and August 2023 to obtain the following data:
- European protected sites (SPA's and Ramsar Sites) within 30km of the development area;
 - National Statutory Sites (SSSI and NNR) within 15km of the development area;
 - Other statutory and non-statutory sites designated for their nature conservation interest within 5km; and
 - Protected species, Species of Principal Importance (SPI) for the conservation of biodiversity (as listed in Section 7 of The Environment (Wales) Act 2016) and species included on the Red List in Birds of Conservation Concern Wales 3 (Bladwell, 2016)⁴⁶ within 5km.
- 5.5.13. Data for Statutory biodiversity sites and protected species was sought from SEWBReC, Aderyn (the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales), NRW Designated Site Search⁴⁷, Joint Nature Conservation Committee (JNCC) and the MAGIC website⁴⁸.
- 5.5.14. In addition, notable bird records were requested for a 2km radius from the Site from the RSPB, British Trust for Ornithology and Gwent Ornithological Society. These bodies either confirmed that data was passed to SEWBReC or did not respond.

⁴⁵ Section 7 Species of Principle Importance in Wales, *Environment (Wales) Act 2016*; and Schedule 1 of *Wildlife and Countryside Act 1981* (as amended)

⁴⁶Johnstone I., Bladwell S. (2016). Birds of Conservation Concern in Wales 3: the population status of birds in Wales. Birds in Wales, vol.14 No.1

⁴⁷<https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en> (accessed 10 September 2024)

⁴⁸ Magic www.magic.gov.uk (accessed 10 September 2024)

- 5.5.15. The desk study has, and will, also include a review of extant planning applications within the vicinity of the study area, including other wind farm proposals, where the ornithology information is publicly available from the planning portal.
- 5.5.16. The desk study will be subject to a further update prior to submission and will incorporate additional search areas extending from the Western Parcel.

Field Surveys

- 5.5.17. The ornithological field survey programme has been designed to provide sufficient information on target species to inform the OIA.
- 5.5.18. Initial bird scoping exercises were completed in July 2020 to identify the suitability of the study area and surrounding landscape for potential target bird species and to ground-truth vantage point locations following some initial desk-based data collation and viewshed analysis. This site visit, alongside the desk study, were used to identify the potential target species and the appropriate scope of survey work.
- 5.5.19. The ornithology surveys commenced in July 2020 and, with reference to best practice (SNH 2017), have continued for over two years. Some refinement of the survey work has taken place over time (e.g. addition of an extra vantage point in 2021) to reflect the ongoing survey findings and small changes to the study area. A summary of the completed and ongoing surveys is provided in **Table 5-21**.

Table 5-21 - Summary of Proposed and Completed Baseline Survey Programme for Ornithology

Survey Type	Proposed Scope of Survey	Survey Timing
Moorland/Breeding Bird Surveys	<p>Four visits to within 100m of all suitable moorland habitat within an 800m radius of the Site (principally land to the east) and all farmland within the Site, as illustrated in Appendix E.1. Surveys were completed using an adapted Brown & Shepherd (1993) methodology to map the breeding territories of upland waders, such as snipe, curlew and lapwing, with other target species and passerines also recorded.</p> <p>With reference to best practice guidance the surveys were timed to start on the farmland habitat around dawn and finish on the moorland habitats present to the north-east of the Site later in the morning. They were undertaken during suitable weather conditions i.e. days/periods with strong winds and heavy or persistent rain were generally avoided.</p> <p>Surveys to date have focussed on the Eastern Parcel, however, the Western Parcel does not contain any Moorland habitat, and it can be assumed that the passerine assemblage associated with the same tree lines grass pasture in the west would be the same. As such, no breeding bird surveys of this area are proposed.</p>	April-July 2021, 2022 and 2024
Breeding Bird Surveys – Nightjar and Owl	With reference to SNH guidance and standard methodology (Hardy et al. 2013 and Gilbert et al 1998), the study area and adjacent landscape, was visited on three occasions in	June/July 2020, 2021 and 2023

	<p>2020, four occasions in 2021, and three occasions in 2023. The surveys were completed during June and July with surveyors walking along pre-determined transect routes, designed to identify the presence or likely absence of breeding nightjar and owls up to 500m and 1km of the Site respectively, as illustrated in Appendix E.2.</p> <p>The surveys are considered to offer adequate coverage to provide sufficient information to assess the siting of turbines in the Western Parcel. An extension of the buffer area to the west would include the lower valley slopes and urban edges of Abercarn, which are unsuitable for nightjar.</p>	
Breeding Raptor Surveys	<p>With reference to SNH guidance (2017) and standard methodology (Hardey et al., 2013), evidence for breeding goshawk within 1km and all other raptor species within 2km of the Site was targeted using pre-determined transect routes to incorporate all identified areas of potentially suitable breeding habitat. These routes varied somewhat from year to year to expand coverage, with the core 2020-2022 routes. In 2024, the route was expanded further north and the new Cwmcarn Forest Drive incorporated to the south with vantage points to provide greater coverage, as illustrated in Appendix E.3. The transect routes were walked and driven on three occasions between April to July inclusive in 2020 and 2024, and four occasions in 2021, and 2022. The surveys did not cover the northern extent of the study area (though the coverage of this area was increased in 2024) which has been surveyed extensively between 2020 and 2022 by EDP to inform the propose Trecelyn Wind Farm.</p> <p>Vantage point locations were selected on the routes that overlook large areas of potentially key breeding habitats. At each vantage point location along the transect route surveyors stopped to record any observed raptor behaviour, with a particular focus on birds displaying or exhibiting other behaviour indicative of breeding.</p> <p>The surveys are considered to offer adequate coverage to provide sufficient information to assess the siting of turbines in the Western Parcel. An extension of the buffer area to the west would primarily include the Abercarn valley with associated roads and housing, which are largely unsuitable for target raptor species.</p>	April-July 2020, 2021, 2022 and 2024
Vantage Point Surveys	<p>A total of 72hrs of survey was completed from a single vantage point (VP) between July 2020 and March 2021 with reference to SNH guidance 2017. This included 24hr during the breeding season (April to August) and the other 48 hours spread across the migratory and winter periods.</p> <p>A second VP was added in the winter period of 2021, where 48 hours of survey was completed. The breeding season of 2021 had another 48 hours of survey completed from each of the two VPs, and 63 hours of survey from each VP was completed over the 2021-22 migration and winter periods. During the 2022 and 2024 breeding season, 36 hours of survey were completed from each VP. A further 48 hours is</p>	<p>July 2020 to August 2022</p> <p>April – March 2024 (ongoing)</p>

	<p>proposed from each VP between August 2024 and March 2025 to capture additional winter and migratory behaviour.</p> <p>With reference to guidance, watches were no longer than 3hrs at one time, appropriate breaks taken between watches and timings spread over the course of the day. The VP and viewsheds (including parameters used to calculate these) are provided in Appendix E.4. Target species flight heights were recorded at 15 second intervals. Based on the worst-case turbine specifications, the following core height bands were used: 0-30m; 30-180m (Collision Risk Zone); and >180m.</p> <p>Additional height band increments were recorded to allow some flexibility with regards to assessing the impacts of the final turbine specification.</p> <p>In addition, the number and activity of ‘secondary’ species was summarised every five minutes.</p> <p>While the VPs do not provide full coverage of the Western Parcel, given the limited findings to date and level of survey effort, it is considered that an additional VP specifically to cover this area will not yield any additional results that are material to the assessment. No additional VPs for this area are therefore proposed.</p>	
Non-Breeding Season Walkover Surveys	<p>Six winter transect surveys of the Eastern Parcel, and adjacent moorland to the east, completed at monthly intervals during the winter months. No other moorland habitat is present within 800m of the Site.</p> <p>A further three surveys re-programmed between November 2024 and February 2025 that will also encompass the Western Parcel.</p>	<p>November-March 2020/2021 and 2021/2022</p> <p>November 2024 to February 2025</p>
Barn Owl Surveys	<p>Records and locations of barn owl nest sites were obtained from the desk study for a 2km radius around the Site. All buildings within 280m and trees within 130m of each proposed turbine location will be assessed prior to submission for their barn owl potential as part of the bat roost assessments, where access allows.</p> <p>In addition, VP survey timings were also varied during the survey season with some three-hour sessions timed to include crepuscular periods to record foraging on-site. Incidental sightings of this species would also have been recorded whilst completing nightjar/owl and bat surveys.</p>	2024 or 2025

Surveys and Species Scoped Out

- 5.5.20. In light of the desk study findings, habitats present, ongoing survey finding and nature of the Proposed Development, certain bird surveys have been scoped out. Such surveys, and justification, for scoping them out is summarised in **Table 5-22**.

Table 5-22 - Summary of Ornithology Surveys Scoped Out

Receptor/Survey	Reason for Scoping Out
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Woodland and Waterbody Point Count Surveys	Woodland and waterbody point count surveys have been scoped out given the absence of notable waterbodies within the Site and lack of anticipated woodland impacts. It was considered that the winter transects would identify any overwintering/migratory waterfowl or waders using the ponds and that woodland target species, such as raptors, owls and nightjars, would be identified through specific survey methods covering these species, as outlined previously. In addition, VP surveys will capture any pertinent movements of target species across the Site from or to such features in the wider landscape. No turbines are proposed in the woodland habitats.
Black Grouse Surveys	Absence of records from the local landscape and limited extents of suitable habitat.
Targeted Hen Harrier or Short-eared Owl Surveys	Absence of suitable habitat on-site and only limited extents of suitable moorland habitat to the wider north-east of the study area. Absence of notable recordings from the suite of other surveys.
Additional Bird Surveys to cover the Western Parcel	In summer 2024 the Western Parcel was added to the Site. Up until this time, the ornithology studies focused on the Eastern Parcel including associated study buffers. Owing to the mobile nature of birds the size of these buffers has ensured that data has also been collated for the Western Parcel, which comprises of similar grass pasture and tree lined boundaries with limited target bird species potential. The Abercarn Valley to the west is more urbanised and less suitable for target species and as such an expansion of study buffers into this area is not considered likely to be pertinent to the assessment. While the two vantage points do not fully cover this parcel or surroundings (see Appendix X.4), Vantage Point 2 does provide some coverage of parts of this area, and target species movements in the vicinity are likely to have been captured. In light of this, the level of survey effort completed from the other VPs and limited target species presence, it is not considered that the additional cost and time associated with surveying from a further VP targeting this area are justified relative to the information it would yield.

- 5.5.21. It is proposed that raven, sparrowhawk and buzzards are scoped out of the OIA and collision risk analysis given their lack of conservation status and abundance across Gwent. With reference to best practice, passerines, which are not typically impacted by windfarm proposals, will also be scoped out of the OIA except where significant habitat loss/disturbance impacts could potentially arise during vegetation clearance, construction and decommissioning.

CURRENT BASELINE

Statutory Designated Sites

- 5.5.22. Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International ornithology designations include SPAs and Ramsar Sites. National designations for birds can include SSSIs and NNRs.
- 5.5.23. No part of the study area is covered by any statutory designations. However, there are several such designations within the study area's potential Zol that include bird species in their citations, as summarised in **Table 5-23** and illustrated in **Appendix E**.

Table 5-23 - Statutory Sites within 30km (International) and 15km (National) of the Site that include Birds as Designated Features

Site Name	Type of Designation	Designated Features	Approximate Distance (m) and Direction from the Site
Severn Estuary (Wales)	SPA/Ramsar Site	<p>The Severn Estuary qualifies under Article 4.1 of the Birds Directive by regularly supporting an internationally important wintering population of Bewick's swan.</p> <p>The Severn Estuary qualifies under Article 4.2 as a wetland of international importance by regularly supporting in winter over 20,000 waterfowl.</p> <p>The Severn Estuary also qualifies under Article 4.2 by regularly supporting in winter internationally important numbers of European white-fronted geese, shelduck, gadwall, dunlin and redshank.</p> <p>In addition, the islands of Flat Holm and Steep Holm support a nationally important breeding population of lesser black-backed gulls.</p>	12,500m south
River Usk (Lower Usk)	SSSI	The River Usk (Lower Usk) supports a wide range of riverside breeding birds such as sand martin and kingfisher nesting in eroding earth cliffs. Yellow wagtail, grey wagtail and dipper occur with increasing frequency above the tidal limit at Newbridge. In addition, marsh warbler breeds in riparian habitat along the river banks. The cut-off meander at Llanfihangel Gobion is an important area for wintering and passage migrants including teal, greenshank and green sandpiper	8,300m south-east
Llandegfedd Reservoir	SSSI	The Site is particularly important for the overall numbers and variety of wintering wildfowl, with large numbers of wigeon, pochard and mallard. Other notable species include goosander, teal and goldeneye.	8,700m north-east
Nelson Bog	SSSI	Valley mire supporting rich ornithological assemblage	9,500m west
Severn Estuary (Flat Holm and Steep Holm)	SSSI	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	12,500m south-east

		important wintering ground of dunlin in Britain.	
Lisvane Reservoir	SSSI	A stream-fed reservoir which makes a useful refuge on the northern outskirts of Cardiff for birds including overwintering mallard, teal, tufted duck, pochard and coot; occasional divers and grebes and many passage migrants.	12,800m south-west
Newport Wetlands	SSSI	In winter, Newport Wetlands support nationally (UK) important numbers of shoveler (<i>Anas clypeata</i>) and black-tailed godwit (<i>Limosa limosa</i>). Other over-wintering species that use the Site include gadwall (<i>A. strepera</i>), wigeon (<i>A. Penelope</i>), shelduck (<i>Tadorna tadorna</i>), dunlin <i>Calidris (alpina)</i> , redshank (<i>Tringa tetanus</i>), whimbrel (<i>Numenius phaeopus</i>) and curlew (<i>N. Arquata</i>). During the summer, the wet grasslands, saline lagoons and reedbeds on the Site support an exceptional variety of breeding birds, including nationally (UK) important breeding populations of avocet (<i>Recurvirostra avosetta</i>), redshank, lapwing (<i>Vanellus vanellus</i>), water rail (<i>Rallus aquaticus</i>), Cetti's warbler (<i>Cettia cetti</i>) and bearded tit (<i>Panurus biarmicus</i>). In addition, breeding populations of ringed plover (<i>Charadrius hiaticula</i>) and little ringed plover (<i>C. dubius</i>) are also present.	13,900m south-east

Non-Statutory Designated Sites

- 5.5.24. 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 county of Caerphilly, such designations are named SINCs. Additional designated sites which should be considered at this level include LNRs, where these are not covered by other designations.
- 5.5.25. There are a number of non-statutory designations within the wider landscape as set out in Section 5.4: Biodiversity. There are no such non-statutory designations, which are wholly designated for their bird interests, that are within 1km of the Site.

SPECIES

- 5.5.26. In general, it should be noted that the Site does not offer significant habitat opportunities for target species. As set out in Section 5.4, the Site comprises cattle and sheep grazed grassland fields bounded and dissected by predominantly defunct hedgerows and tree lines. A small pond is present but these are not sufficiently large to support notable wetland bird opportunities. Higher quality moorland habitat is present to the north-east of the Site, however, this is relatively limited in extent.

The surrounding valley sides are dominated by coniferous plantations which afford some opportunities for target species, including nesting raptors, owls and nightjar.

5.5.27. **Table 5-24** provides a high-level summary of the bird survey results according to survey type. However, it should be noted that full analysis of the survey data is yet to be completed. Full reporting, including collision risk analysis, will be provided as part of any final assessment.

Table 5-24 - High-level Summary of Target Species Recorded During Ornithology Surveys (subject to further data analysis)

Survey Type	Summary of Survey Results
Moorland/Breeding Bird Surveys	<p>Breeding bird surveys undertaken in spring and summer 2021,2022 and 2024 recorded several species on the Red and Amber lists within Birds of Conservation Concern (BoCC) 4 for Wales. Of those species on the Amber list, mistle thrush and bullfinch were recorded and confirmed to have bred. Of those on the Red list, linnet and tree pipit were recorded and confirmed to have bred. Cuckoo, another Red listed species was also recorded and is considered likely to breed in the wider Study Area. Most species were confined to the tree lines within the Site, where cover, foraging and nesting opportunities are more readily available.</p> <p>Birds listed under Section 7 of The Environment (Wales) Act 2016 recorded within the Site included cuckoo, dunnoek, kestrel, linnet, song thrush, starling, and tree pipit. No species listed on Schedule 1 of the Wildlife and Countryside Act (WCA) 1981 (as amended) were recorded during the breeding bird surveys.</p> <p>The diversity and abundance of species recorded is relatively limited and no notable breeding populations of target species were recorded.</p>
Breeding Bird Surveys – Nightjar and Owl	<p>The nightjar and owl surveys confirmed the presence of several pairs of breeding nightjar and tawny owl within 1km of the Site associated with the coniferous wooded valley sides and mosaic of associated clear fell and successional scrub. The Site itself, which comprises grass pasture, is largely sub-optimal for nightjar. Breeding pairs (max count of seven churring males) are present in the valleys to the south and east of the Site in association with felled woodland areas. Nightjar are listed under Section 7 of The Environment (Wales) Act 2016.</p>
Breeding Raptor Surveys	<p>In 2020, very few raptor records were made. A pair of kestrel were seen hunting together during a raptor survey in July. A suspected buzzard nest was also found during this survey. Both of these records were from an area to the south of the Site.</p> <p>In 2021, a red kite nest was located to the west of the Site. A goshawk was seen during one of the surveys, but by far the most recorded species were buzzard and raven.</p> <p>In 2022, a goshawk was recorded displaying and carrying food to the south of the Site, and in later surveys, a juvenile was seen in the same area. Additionally, a family party of raven was seen, a buzzard was recorded feeding a juvenile, and two separate pairs of red kite were also seen.</p> <p>In 2024, a goshawk was recorded carrying food and calling on separate occasions between 1-2km to the south-east of the Site. A kestrel was also observed hunting over moorland habitat c.2km to the east of the Site. A number of pairs of buzzard and raven were recorded but no specific nest sites, while red kite was only recorded occasionally but no specific nesting area identified.</p> <p>Kestrel, red kite, and goshawk are considered likely to breed within the wider Study Area or relatively closely outside of this, with the closest known nest site the red kite nest to the west of the Site. Although relatively common and widespread in southern</p>

	<p>Wales and Gwent, red kite and goshawk are listed on Schedule 1 of the WCA, while kestrel is a priority and red list species.</p> <p>Trecelyn Wind Farm raptor surveys in the northern extent of the Study Area recorded the presence of a pair of breeding peregrine and goshawk around 2km north from the Site</p>
Vantage Point Surveys	<p>Several target species have been identified occasionally during the surveys. The most frequently recorded species has been goshawk. This species was seen hunting over the Site as well as carrying food. Later surveys recorded juvenile goshawks in 2022. Other target species recorded in lower numbers include red kite, lesser black-backed gull, herring gull, and grey heron.</p> <p>All other target species were rarely recorded and not considered pertinent to the assessment.</p> <p>In terms of secondary species, raven and buzzard were the species most regularly recorded, and seen throughout the year.</p>
Non-Breeding Season Walkover Surveys	<p>The winter transect surveys did not record any notable flocks of wildfowl or waders. Snipe were rarely recorded and were associated with moorland to the north-east of the Site.</p> <p>Goshawk was recorded on occasion, as were kestrel and buzzard. The largest numbers of birds of conservation concern were skylark and meadow pipit, most of which were associated with the moorland to the north-east.</p> <p>No large flocks of any species were recorded.</p> <p>Overall, the winter bird assemblage supported by the Study Area includes very few target species and is considered to be typical of pastoral grassland in southern Wales.</p>

THE SCOPE OF THE ASSESSMENT

Potential Ornithology Features

- 5.5.28. The starting point for defining which ornithological features⁴⁹ will be taken forward to the detailed assessment stage will be to use the baseline data collected through the desk study and field surveys to determine which of the identified ecological features are ‘important’ at the level of the project. Following CIEEM (2022) guidance, the importance of ornithological features will be determined using a geographic scale and described in relation to UK legislation and policy, and with regard to the extent of habitat or size of population that may be affected by the Proposed Development.
- 5.5.29. The importance of ornithological features can therefore differ from that which would be conferred solely by legislative protection or identification as a conservation notable species.
- 5.5.30. Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features will be used to inform the categorisation and determine importance at the project level. Where detailed criteria or contextual data are not available,

⁴⁹ The Chartered Institute for Ecology and Environmental Management (CIEEM) refer to biodiversity receptors within technical guidance as ecological features. This term is therefore used in this chapter in place of ‘receptors’ but for the purposes of the assessment they are the same

professional judgement will be used to determine importance. Example criteria for determining the importance of IOFs are provided in **Table 5-25**.

Table 5-25 - Importance of the Proposed Development for Ornithology Features

Geographic Context of Importance	Description
International	<p>International nature conservation areas including any SPA, proposed SPA or Ramsar.</p> <p>Populations of internationally designated site qualifying species that depend on the Development Site (i.e., functionally linked to the designation).</p> <p>Species present in internationally important numbers (>1% of European populations).</p> <p>Species listed on Annex I of the EC Birds Directive if present in qualifying numbers/proportions of international population.</p>
National (Wales/UK)	<p>National nature conservation areas, including any SSSI or NNR designated for ornithology features.</p> <p>Populations of national nature conservation area qualifying species that depend on the Development Site (i.e., functionally linked to the designation).</p> <p>Breeding or overwintering populations of ecologically sensitive rare bird species (<300 breeding pairs in the UK).</p> <p>Species present in nationally important numbers (>1% Welsh/UK population).</p> <p>Regularly occurring relevant migratory species, which are of rare and/or of significant conservation concern that warrant special consideration on account of the proximity of migration routes, breeding, wintering and staging areas in relation to the Development Site.</p>
County (Caerphilly)	<p>Local nature conservation areas designated for ornithology, including any LNR or SINC.</p> <p>Populations of species for which a locally designated site has been designated that depend on the Development Site.</p> <p>County-scale important population/assemblage of bird species listed on Schedule 1 of the WCA or Section 7 of The Environment (Wales) Act 2016</p> <p>Species present in regionally important numbers (>1% regional population).</p> <p>Significant breeding or overwintering populations of species on the Red List for Birds of Conservation Concern within the county context.</p> <p>Significant species, populations or assemblage that would meet the criteria set for SINC designation.</p>
Local	<p>Breeding or overwintering populations of bird species listed on Schedule 1 of the WCA or Section 7 of The Environment (Wales) Act 2016 where not captured in higher scale categories.</p> <p>Other species of conservation interest where a notable population is present, e.g. reasonable size breeding populations of red- or amber-listed species of Birds of Conservation Concern.</p>

Site (Less than local)	All other species not included in the above categories, such as populations of green-listed species or smaller populations of certain conservation concern species that are otherwise common and widespread. Such species are normally scoped out of the assessment process.
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- 5.5.31. Where protected bird species are present and there is the potential for a breach of the legislation, those species will be considered as ‘important’ features. With the exception of such species receiving specific legal protection, or those subject to legal control (e.g. invasive species), all ecological features determined to be important at less than a local level will be scoped out of the assessment. Further, ecological features of greater importance, where justified, will also be scoped out. This is because effects on them would not influence the decision-making about whether or not consent should be granted for the development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM 2022. All bird species that are of sufficient importance will then be taken through to the next stage of the scoping assessment.
- 5.5.32. Based on the preliminary findings of the desk and field investigations (full data analysis is still required) a list of the anticipated Important Ornithological Features (IOFs) that will be subject to full OIA and their geographic valuation, are provided in **Table 5-26**.

Table 5-26 - Preliminary List of Potential Ornithological Features Requiring Consideration (subject to full survey data analysis)

Geographic Context of Importance	Description
International or European	Severn Estuary SPA/Ramsar - gulls from breeding colonies at Flat Holm and Steep Holm SSSIs forage as far inland as the Development and various gull species have been recorded during the survey work. This includes lesser black-backed gull, the breeding population of which is a designated feature.
National	Severn Estuary SSSI – as above.
County	Nightjar – a number of pairs breed in close proximity to the south of the Site.
Local	Goshawk – present all year and likely to be breeding in close proximity to the Site. Seen foraging and/or commuting over the Site; Red kite – present all year and breeding locally. Infrequently forages over the Site; Kestrel – recorded on occasion and believed to breed within wider landscape; and Breeding bird assemblage – common and widespread assemblage of passerines with modest populations of conservation concern/priority species, particularly associated with the boundaries and the moorland habitats to the north-east of the Site.
Negligible/Site/Less than Local	All other designated sites; and All other species.

Likely Significant Effects

- 5.5.33. In accordance with the EIA Regulations 2017, the EIA for Rhyswg Wind Farm will consider those impacts where there is a risk of a likely significant effect only. The following section draws on industry experience and expertise to identify those effect-receptor pathways that may potentially lead to a significant effect.
- 5.5.34. The likely significant effects relating to ornithology that will be taken forward for assessment in the EIA are summarised in **Table 5-27**.

Table 5-27 - Likely Significant Effects Relating to Ornithology

Activity	Effect	Receptor
Construction		
Change of land use including ground clearance for construction sites (including laydown areas, staff facilities etc.), enabling works and accesses.	<p>Degradation and/or loss of breeding, foraging or refuge habitat.</p> <p>Reduction in suitability of retained breeding, foraging or refuge habitat due to introduction of sub-optimal features nearby.</p> <p>Loss of habitat connectivity or viability through severance of habitats resulting in fragmentation.</p> <p>Killing or injury of birds, particularly nesting birds, through the removal of occupied nests or refuge sites.</p>	Breeding Bird Assemblage. Nightjar (subject to access arrangements).
Production of aural and visual stimuli and vibration from construction activities such as vehicular movements, piling or site personnel.	Disturbance and displacement of species susceptible to noise/visual disturbance resulting in a reduction of energy intake and/or an increase in energy expenditure potentially leading to a reduction in survival and productivity rates.	Breeding Bird Assemblage including nightjar, kestrel, goshawk and red kite.
Use of temporary lighting for security purposes or to illuminate construction working areas	<p>Disturbance and displacement of birds sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites.</p> <p>Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates.</p> <p>Loss of ecological connectivity through severance (due to introduction of light) of habitats resulting in fragmentation.</p>	Breeding bird assemblage, nightjar.
Construction/alteration of drainage to facilitate construction works.	Direct loss or degradation of breeding, foraging or refuge habitat due to changes in hydrology.	None – scope out.

Use of chemicals (e.g. fuels, solvents etc.) and liberation of pollutants and fine material through excavation, demolition or surface water flows during rainfall events	The introduction of toxic pollutants or sediments into the environment resulting in changes, loss or damage to terrestrial or freshwater environments and the birds they support.	None – scope out.
Operation		
Turbine operation	Potential killing or injury to birds in flight, through direct collision with moving turbine blades or barotrauma.	Red kite, kestrel, goshawk, herring gull, lesser black-backed gull, nightjar.
Physical changes to the spatial environment	Displacement of birds from usual foraging and migratory routes.	Red kite, kestrel, goshawk, herring gull, lesser black-backed gull, nightjar.
Vehicle movements	Potential killing or injury of birds through road traffic collisions.	Breeding bird assemblage.
Temporary hydrological changes (changes to sub-surface and surface water flows)	Changes to local hydrology resulting in changes or loss of surrounding habitats.	None – scope out.
Use of lighting for security or aviation safety purposes	Disturbance and displacement of species sensitive to lighting resulting in indirect loss of foraging and commuting habitat or resting or breeding sites. Disruption of the physiology of species reliant on natural day/night and seasonal light level changes resulting in loss of fitness and reduction in survival rates. Loss of ecological connectivity through severance (due to introduction of light) of habitats resulting in fragmentation.	None – scope out.
Decommissioning	As per construction phase.	Breeding bird assemblage, nightjar.

Potential Effects not Requiring Further Assessment

- 5.5.35. While the Severn Estuary SPA/Ramsar will require further consideration with respect to lesser black-backed gulls moving over the Site and potential collision risks, it is anticipated that the need for an Appropriate Assessment can be screened out as part of the OIA process given the limited number of flights within the collision risk zone. Likewise, potential impacts upon the Severn Estuary SSSI (Flat Holm and Steep Holm) are considered unlikely to be significant but will be considered further as part of the OIA.
- 5.5.36. There are no other statutory or non-statutory designated sites that include birds as a designated feature which have been identified as potential OIA's at this stage.
- 5.5.37. It is also proposed that raven and buzzard are scoped out of the OIA owing to their common and widespread distribution despite being relatively frequently recorded on. Sparrowhawk is also

proposed to be scoped out for the same reasons, limited flight activity and their low risk of collisions with turbines.

- 5.5.38. All other target species recorded during the surveys (see Table X.6), apart from those listed as IOFs, are considered to be so rare within the Site and Study Area that they do not need to be scoped into the OIA.
- 5.5.39. Based upon the survey findings collated to date and best practice guidance, it is also considered that passerines, such as skylark, tree pipit and meadow pipit, can be scoped out as individual IOFs within the OIA, though consideration will need to be given to their legal protection and a collective 'breeding bird assemblage' IOF will therefore be utilised.
- 5.5.40. Further assessment will also need to be undertaken for additional potential impacts arising from the Proposed Development in respect to aspects of development design which have yet to be defined, such as: access routes; additional ancillary development; and in respect of the proposed construction programme.

ASSESSMENT METHODOLOGY

- 5.5.41. The generic project-wide approach to the assessment methodology is set out in Chapter 4. However, whilst this will inform the approach used in the ornithology assessment, it is necessary to align with the standard industry guidance provided by CIEEM (2022).
- 5.5.42. The assessment will be based upon not only the results of the desk study and field surveys, but also relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.
- 5.5.43. For each scoped-in ornithological feature, effects will be assessed against the predicted future baseline conditions for that feature during construction, operation and decommissioning.
- 5.5.44. Throughout the assessment process, the initial results of the assessment regarding potentially significant effects will be used to inform whether additional baseline data collection is required, together with the identification of environmental measures that should be embedded into the development proposals to avoid or reduce adverse effects or to deliver enhancements.
- 5.5.45. Where part of a designated site is located within the ecological ZoI⁵⁰ relating to a particular biophysical change as a result of the Proposed Development, aⁿ assessment will be made of the effects on the designated site as a whole. A similar approach will be taken for areas of notable habitat.
- 5.5.46. For species that occur within the ZoI, the assessment will consider the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or as breeding territories).

⁵⁰ The ZoI in this context is the area over which an individual ecological feature may be subject to a potentially significant effects resulting from changes in the baseline environment due to the Proposed Development.

- 5.5.47. Full assessment and analysis of flight line data using collision risk modelling will be completed with reference to best practice (SNH 2000, Band et al. 2007)).

Significance Evaluation Methodology

Characterising Potential Impacts

- 5.5.48. The CIEEM guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the Zol 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 consideration of 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 Zol during the lifetime of the Development.
- 5.5.49. When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters:
- Positive or Negative – whether the change is in accordance with the nature conservation objectives and policy (whereby a positive impact is one that improves the quality of the environment, a negative impact being one that reduces it);
 - Extent – the spatial or geographical area over which the environmental change may occur;
 - Magnitude – the size, amount, intensity or volume of the environmental change;
 - Duration – the length of time over which the environmental change may occur;
 - Frequency – the number of times the environmental change may occur;
 - Timing – the periods of the day/year etc. during which an environmental change may occur; and
 - Reversibility – whether the environmental change can be reversed through restoration actions.

Significance Criteria

- 5.5.50. The 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 ecological feature, 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.
- 5.5.51. Although certain species and habitats may not constitute potential ecological features based upon their nature conservation value they may still warrant consideration during the design and mitigation of the Proposed Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.
- 5.5.52. The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.
- 5.5.53. The significance of the potential impacts upon potential ecological features will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the proposals. Consideration will also be given to the potential

future impacts to potential ecological features arising as a result of global trends and climate change.

- 5.5.54. 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 Proposed Development and, if this is the case, for an Appropriate Assessment (AA) to be undertaken. Whilst the HRA is the responsibility of the Competent Authority, information to inform this process will be prepared.

Cumulative and In-combination Effects

- 5.5.55. The OIA will give due consideration to potential in-combination or cumulative effects resulting from other development proposals within the Zol. In respect of potential ecological features, consideration will be given to such developments within the same range of mobile bird species. In respect of developments to be included within the cumulative assessment, this will include: schemes which are operational or under construction; schemes which have been granted planning permission but are not yet constructed/operational; and proposals for which consent has been applied but which await determination (including those subject to determination at appeal). Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain, and/or in respect of potential development relating to pre-assessed areas defined within Future Wales: The National Plan 2040.

APPROACH TO MITIGATION AND COMPENSATION

- 5.5.56. The mitigation hierarchy and step-wise approach will be adopted, following the sequential process of avoidance, minimisation, mitigation and compensation. Inherent in the design of the Development will be the avoidance of impacts upon potential ecological features as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure. Where such impacts cannot be altogether avoided however, mitigation will be implemented to ensure such impacts are reduced as far as possible so as to minimise harm upon potential ornithological features. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been taken into account. Additionally, enhancement measures will also be implemented so as to ensure overall net benefit to biodiversity are achieved. Such enhancements would be proposed following consultation with relevant stakeholders to ensure that any measures proposed were compatible with ongoing management of the Site.
- 5.5.57. Avoidance, minimisation, mitigation, compensation and enhancement measures to be implemented as part of the Development will be informed by those ongoing ornithology field surveys of the study area, as detailed previously above, alongside further consideration of the development proposals as they evolve. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Method Statement detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a Habitat Management Plan detailing those management, maintenance and monitoring measures requiring delivery over the lifetime of the Development.

Assumptions

- 5.5.58. To ensure transparency in the OIA, any assumptions or limitations in the collation of baseline information will be highlighted and a precautionary approach to the consideration of potentially significant effects and mitigation adopted. To date, the following limitations and assumptions have been identified:
- Access to certain parts of the surrounding landscape has not been possible in all instances due to health and safety limitations or where access from private landowners cannot be gained. Where possible/necessary, ornithology observations were otherwise made from adjacent public rights of way or accessible land. Any such constraints will be highlighted, and a precautionary approach adopted with regards to the presence/valuation of species and potential for significant effects to arise;
 - The topography and presence of large stands of coniferous woodland presented a challenge to ensuring total coverage of the Site and up to 500m from turbine locations, from the selected VPs (see Appendix x.4). However, the number and locations chosen are considered to provide sufficiently robust coverage to inform the OIA;
 - Inclement weather meant that certain surveys had to be aborted. If this occurred, where possible, surveys were rescheduled during better conditions to ensure the necessary survey effort was completed; and
 - Species are mobile and surveys therefore only provide a snapshot of the conditions present across the study area at the time of survey with a precautionary approach adopted based on habitat suitability and records of species locally.

5.6 WATER ENVIRONMENT

- 5.6.1. This section describes the proposed scope of the assessment with regard to the Water Environment.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.6.2. **Table 5-28** lists the planning policies and guidance that are relevant to the water environment and sets out the implications of the guidance and policies for the scope of the EIA.

Table 5-28 - Planning policy relevant to the water environment assessment

Planning policy document	Context
National planning policy	
National Development Framework (Future Wales: The National Plan 2040)	<p>This is the national development framework for Wales, which has development plan status.</p> <p>Policy 8 – Flooding</p> <p>The policy sets out the requirement for sustainable development which puts a priority on nature-based flood management solutions, as well as supporting strategic growth and regeneration in National and Regional Growth Areas.</p> <p>Policy 19 – Strategic Policies for Regional Planning</p>

	<p>The policy states that environmental consideration when planning developments and managing resources is vital, on a strategic and local scale. Environmental issues identified must be fully assessed and addressed.</p> <p>Policy 33 – Cardiff, Newport and the Valleys</p> <p>This policy sets out the ambitions for the Cardiff, Newport and Valleys region of Wales, which includes Caerphilly. This is inclusive of development and growth strategies with reference to natural resources, climate change, flooding and biodiversity.</p>
<p>Planning Policy Wales (PPW)</p>	<p>The PPW sets out the land use planning policies of the Welsh Government.</p> <p>It details the requirements when constructing new developments including the provision of Sustainable Drainage Systems (SuDS) enabling surface water to be managed and consideration of impacts to water resources (groundwater and ecology).</p>
<p>The National Strategy for Flood and Coastal Erosion Risk Management (FCERM) in Wales, Welsh Government</p>	<p>The National Strategy for FCERM in Wales, as required under the Flood and Water Management Act 2010, set out the management approach for risks associated with flooding and coastal erosion across Wales over a 10-year period. Natural Resource Wales (NRW) are responsible for managing the flood risks from the main rivers and sea across Wales; whilst Local Authorities as Lead Local Flood Authorities (LLFA) are responsible for managing risks associated with surface water, groundwater, and Ordinary Watercourses.</p>
<p>Technical Advice Note 15 (TAN15)</p>	<p>TAN15 provides technical guidance which supplements the policy set out in Planning Policy Wales (Edition 10, December 2018) (Welsh Assembly Government, 2018) in relation to development and flooding, providing a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Consultation on an updated version of TAN15 has been undertaken. The draft update includes a range of changes to the guidance, in particular it removes reference to the Development Advice Map (DAM) and refers to a “Wales Flood Map” held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed (anticipated to be during 2023). TAN15 (2004) has therefore been used to underpin this assessment. TAN15 is supplemented by the Development Advice Map (DAM) which provides the basis for assessment under TAN15. The DAM was last updated in January 2020.</p> <p>Justification Test</p>

	The Justification Test is intended to assess the appropriateness of proposed developments, based upon location in respect of flood zones and the type of development proposed.
Local planning policy	
Caerphilly County Borough Local Development Plan up to 2021 (Adopted November 2010)	<p>CW5 Protection of the Water Environment</p> <p>This policy states that development proposals will only be permitted if they will not have an unacceptable adverse impact upon the water environment and will not pose an unacceptable risk to the quality of controlled waters (including groundwater and surface water). This assessment should consider the impact of climate change.</p>

Legislation

- Control of Pollution Act 1974
- Environmental Protection Act 1990
- Land Drainage Act 1991 and 1994
- Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009
- Water Act 2003
- Environment Act 1995
- Water Quality (Water Supply) Regulations 2017 (as amended)
- Priority Substances Directive (2008/105/EC)
- Revision of the Priority Substances Directive (2013/39/EU)
- The EU Floods Directive (2007/60/EC), as enacted into domestic law by the Flood Risk Regulations 2009
- Flood and Water Management Act 2010
- The Water Environment (Water Framework Directive) (England and Wales) (Amendment) Regulations 2015
- Environment (Wales) Act 2016
- Private Water Supplies (Wales) Regulations 2017
- Environmental Permitting (England and Wales) Regulations (EPR), 2016 (as amended)
- The European Union (EU) Water Framework Directive (2000/60/EC) (WFD) as enacted into domestic law by the Water Environment WFD (England and Wales) (Amendment) Regulations 2017
- Environment Act, 2021

Technical Guidance

- NRW - Flood consequence assessments: climate change allowances;
- PINS Advice Note 18: The Water Framework Directive;
- GOV – Guidance: Groundwater risk assessment for your environmental permit;
- Environment Agency - The Environment Agency’s approach to groundwater protection; and
- Natural Resources Wales - How to comply with Sustainable Drainage Systems (SuDS) standards.
- Sustainable Drainage (SuDS) Statutory Guidance, Welsh Government

BASELINE

Current Baseline

- 5.6.3. This section provides a high-level review of the current baseline environmental characteristics for the Proposed Development site and surrounding areas, with particular reference to the water environment. The baseline conditions will be confirmed through review of additional data sources, site visit and consultation with stakeholders during the next stages of the EIA.
- 5.6.4. The Site comprises an expanse of agricultural fields, inclusive of farm buildings and access tracks. A network of hedges and trees divide a number of the fields. Directly to the north is the Gwyddon Valley. To the east of the Eastern Parcel is the Ebbw Forest, whilst to the south is Cwmcarn Forest. The site is situated on gently sloping ground along Cefn Rhyswg. Ground elevation ranges between 390 AOD in the east and 330 AOD in the west.

Hydrology

- 5.6.5. The site is located within the South East Valleys catchment, in proximity of the Afon Ebwy Main River, which flows from north to south through the Ebwy Valley, to the west of the Proposed Development. A spring runs through the south of the site and joins the Nant Carn watercourse, which flows through Cwmcarn Forest to the south and joins the Ebbw River at Cwmcarn. A very small stream arises in the Eastern Parcel and joins the Nant Carn watercourse, which flows through Cwmcarn Forest to the south and joins the Ebbw River at Cwmcarn. There is one pond within the Eastern Parcel, and one pond within the Western Parcel. A further seven ponds occur within 250m of the Site. A tenth pond is also situated just beyond 500m to the north-east of the Eastern Parcel.

Hydrogeology

- 5.6.6. The South Wales Upper Coal Measures and Alluvium deposits within the study area are classified by NRW as Secondary A Aquifers which by definition are “permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers”. These are generally aquifers formerly classified as minor aquifers.
- 5.6.7. The South Wales Upper Coal Measures underlying the study area is a designated WFD groundwater body (SE Valleys Carboniferous Coal Measures GB40902G201900) and achieved ‘Good’ quantitative status and ‘Poor’ chemical status in the 2016 WFD classification (Cycle 2).⁵¹
- 5.6.8. The Proposed Development site is not within a Source Protection Zone (SPZ).⁵²
- 5.6.9. A summary of the current geology and soils baseline is provided in Section 5.7.

Flood Risk

- 5.6.10. Consultation on an updated version of TAN15 (2004) was completed (January 2020 with further consultation in January 2023) and was expected to be implemented during 2023 but has yet to be.

⁵¹ NRW Water Watch Wales for Water Framework Directive (WFD) Cycle 2 rivers and waterbodies, including status (available online) www.naturalresourceswales.gov.uk

⁵² DataMapWales for source protection zones (SPZs) (available online) https://datamap.gov.wales/layers/inspire-nrw:NRW_Source_Protection_Zones

The draft update TAN15 (2021) includes a range of changes to the guidance, in particular it removes reference to Development Advice Map (DAM) and refers to the Flood Map for Planning held by NRW. The Flood Map for Planning has no official status until the Welsh Government implements the revised TAN15, however it is considered by NRW to represent the best available information on flood risk.

- 5.6.11. NRW's Flood Map for Planning includes extent of historical flood events. The mapping shows that there are no recorded historical flood events within or in proximity to the Proposed Development. The only event recorded in proximity to the site occurred in Trecelyn in December 1979. This event occurred over 1.5km to the west of the Proposed Development and at significantly lower elevation (110mAOD) than the Proposed Development (330 to 380m AOD).
- 5.6.12. The Welsh Assembly Government's TAN-15 DAM shows that the Proposed Development is located within Zone A and is considered to be at little or no risk of fluvial or coastal/tidal flooding. The NRW's Flood Map for Planning for Rivers⁵³ shows that the Proposed Development is located entirely within Flood Zone 1; and is therefore at low probability of flooding from these sources (<0.1% AEP including the effects of climate change). The closest areas of higher flood risk (Flood Zones 2 / 3 or B / C) are associated with the Afon Ebwy to the west, the Nant Gwyddon to the north and the Nant Carn to the south of the site.
- 5.6.13. In terms of surface water flood risk, NRW's Flood Map for Planning for Surface Water and Small Watercourses⁵⁴ indicates that the majority of the Proposed Development Site is at very low risk of flooding (Flood Zone 1, <0.1% AEP) from surface water. Small areas of low to high flood risk (Flood Zones 2 and 3, 0.1% to >3.3% AEP) are shown on localised lower-lying areas which include small watercourses (Nant Gofapi) and pond in the Eastern Parcel.
- 5.6.14. The Proposed Development Site is not within an area of reservoir flood risk. In the wider area, flooding from artificial sources is predicted along the Afon Ebwy. This is associated with potential failure/breach of reservoirs upstream of the study area with flood water flowing south along the valley. No raised bodies of water are proposed as part of the development. On this basis risk of flooding from artificial sources in the area is considered to be low.
- 5.6.15. A number of designated sites for biodiversity conservation are located within or close to the site (see Section 5.4). These include potential hydrologically connected: Gwydon Valley Woodlands, Abercarn SINC, a large area of forestry plantation on the site of former ancient woodland, with acid grassland supported, abuts the northern boundary; Distillery pond, Abercarn SINC, which is a pond on the Nant Gwyddon stream held back by a dam on its western side. Its pond margins supporting a range of wetland species; and Cwmcarn Slopes, Cwmcarn SINC supporting heathland, acid grassland and replanted. Information on the conservation sites will be collected through further consultation with stakeholders during the next stages of the EIA in order to confirm the sites which

⁵³ Flood Map for Planning Flood Zones 2 and 3 <https://datamap.gov.wales/layergroups/inspire-nrw:FloodMapforPlanningFloodZones2and3>

⁵⁴ Flood Map for Planning: Surface Water and Small Water Courses Flood Zones (available online) https://datamap.gov.wales/layers/inspire-nrw:NRW_FLOODZONE_SURFACE_WATER_AND_SMALL_WATERCOURSES

are considered to be water-dependant and therefore likely to be affected by the Proposed Development.

Future Baseline

- 5.6.16. Hydrological and hydrogeological baseline conditions may change even if the Proposed Development is not built out, for the following reasons:
- Climate change will result in increased rainfall seasonality, with generally wetter winters and drier summers; high-intensity rainfall events will become more common. This will lead to greater variation in river flows (low flows and high flows), and increases in flood risk;
 - The location and rate of surface water and groundwater abstractions in the area could vary over time and may result in changes to the WFD surface water and groundwater body status and SPZ designations;
 - Improvements to WFD waterbody status associated with improvements to individual quality elements (i.e., phosphate reduction) would result in higher-quality, more sensitive waterbodies; and
 - Other new development (e.g., urbanisation settlements) along the valley bottoms may result in changes in hydrological baseline such as surface water runoff (flow and pathways) and increase the number of development receptors.

THE SCOPE OF THE ASSESSMENT

Potential Receptors

- 5.6.17. There are a number of potential water environment receptors which could be affected by the Proposed Development, which will be confirmed in the next stages of the EIA assessment. These comprise:
- Afon Ebwy (Main River and WFD surface water body) which flows to the west of the Proposed Development;
 - Tributaries of Afon Ebwy (Nant Gwyddon, Nant Carn and unnamed watercourses, all Ordinary Watercourses) which flows to the west of the Proposed Development;
 - Springs within the study area;
 - Ponds/lakes within the study area;
 - Groundwater in the Hughes Member of the South Wales Upper Coal Measures (Secondary A Aquifers and WFD groundwater body);
 - Surface water and groundwater abstractions within the study area (if present);
 - Biodiversity sites within the study area that are water-dependent (non-statutory designated sites (SINCs), no statutory designated sites); and
 - Humans/properties/infrastructure downslope and adjacent to the Proposed Development area including properties at and the surrounding villages.

Likely Significant Effects

- 5.6.18. The likely significant water environment effects for the construction, operational and decommissioning phases of the Proposed Development that will be taken forward for assessment in the Environment Statement are summarised below. The effects for the decommissioning phase are expected to be similar in nature to the construction phase. As far as is practicable the Proposed Development infrastructure will be removed. Decommissioning effects will typically be temporary, short term effects that will occur during the break-up and removal of infrastructure:

Table 5-29 - Likely significant water effects

Activity	Effect
Construction and Decommissioning Phase	
Land preparation (earthworks, excavation)	<p>Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance.</p> <p>Accidental release of pollution into the water environment by leaks/spillages of oil/fuel, leaching from excavated soils and concrete leaching leading to deterioration.</p> <p>Discharge of potentially polluted water generated from construction activities (e.g., dewatering/water ingress activities, concrete batching, surface water runoff) into surface water or groundwater leading to deterioration in the water quality of the water environment receptors.</p>
Land preparation (earthworks, excavation)	Temporary increase in sediment-loading of surface water runoff from construction/dismantling areas leading to deterioration in the surface water quality environment and deterioration in the status of WFD surface water bodies.
Impermeable land associated with access tracks and construction/dismantling areas	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow.
Development of temporary infrastructure (e.g., site compound) near watercourses and potential temporary watercourse crossings (to be confirmed within final designs)	Temporary changes to watercourse flow conveyance leading to deterioration in the status of WFD surface water bodies.
Operational Phase	
Impermeable land take (solid concrete foundations for turbines, substation and access tracks)	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow. Changes to watercourse flow conveyance as a result of new or modified temporary watercourse.
Maintenance activities	<p>Accidental spillage of pollutants (fuel or oil) leading to deterioration in the water quality.</p> <p>Potential change to water quality of a water supply resource which may affect the viability of an abstraction.</p>

5.6.19. A Flood Consequences Assessment (FCA) will be produced in accordance with TAN15 as the Proposed Development area exceeds 1ha and is within Flood Zone 1. The FCA will demonstrate how flood risk to the Proposed Development and any potential to increase flood risk to third parties due to the Proposed Development will be managed over its lifetime. As part of this, the effects of climate change will be given due consideration. The FCA will include an outline surface water

drainage strategy, which will ensure that surface water runoff from the Proposed Development is managed and attenuated on site, so that the risk of flooding is not increased off-site. The most suitable surface water drainage strategy for the Proposed Development will be ascertained by undertaking a high-level SuDS Assessment considering the SuDS hierarchy.

- 5.6.20. No identified potential water receptors or effects have been scoped out of the assessment at this stage.

ASSESSMENT METHODOLOGY

General Approach

- 5.6.21. The proposed approach will be confirmed with the NRW, LLFA and the LPA during the next stages of the EIA. The significance of an effect resulting from the Proposed Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of the hydrology, the key determinants of magnitude relate to surface water quantity (level and flow), and water quality. However, depending on the effects of surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk.

Significance Evaluation Methodology

- 5.6.22. The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects are considered to be significant or not significant according to the matrix in **Table 5-30**, with 'Major' and 'Moderate' effects taken to be 'Significant'. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

Table 5-30 - Significance evaluation matrix relating to the water environment

		Magnitude of change			
		High	Medium	Low	Very Low
Value/importance/value	High	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

- 5.6.23. Note: 'Significant' effects are those identified as 'Major'. 'Moderate' effects would normally be deemed to be 'significant'. However, there may be some exceptions, depending on the application of professional judgment.
- 5.6.24. In this assessment, only the potential and residual significance of change with respect to the water environment (groundwater levels, flows and quality, and river flows, quality and morphology) and flood risk are considered. It is important to recognise that a 'Significant' change in the water environment does not necessarily result in a 'Significant' change to ecological features. Indeed,

because of the different benchmarks and magnitude criteria used by the two assessments, it is possible that a ‘Not Significant’ change in the water environment can still sit alongside a ‘Significant’ change in an associated ecological water feature, and vice-versa.

Assumptions

- 5.6.25. The scope of this assessment has been based on a high-level review of desk-based baseline information, which will be confirmed through review of additional data sources, a site visit and consultation with relevant stakeholders (NRW, LLFA, LPA, SAB) during the next stages of the EIA process. A site visit will be undertaken to confirm the findings of the desk review, relating to geological/hydrological and hydrogeological environment. This will also confirm whether the local mapped water features are hydrologically active.

5.7 GROUND CONDITIONS

- 5.7.1. This chapter describes the proposed scope of the assessment of effects, with respect to Ground Conditions, arising from the Proposed Development. It includes consideration of geology, land contamination, and soil receptors.
- 5.7.2. The scope of the assessment is based on a review of desk-based baseline information and will be confirmed through review of additional data sources and a site walkover, the findings of which will be reported in the ES.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

- 5.7.3. This scoping report chapter has been prepared in line with the relevant planning policy documents, including **Table 5-31** below:

Table 5-31 - Policy relevant to geology, land contamination and soils

Planning Policy	Description
Planning Policy Wales, Edition 12, 2024	<p>Planning Policy Wales Distinctive and Natural Linkages chapter, page 128, states that decisions on planning applications must consider the policy topics of the Distinctive and Natural Places theme, including “opportunities in all areas to improve the resilience of ecosystems by addressing building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources” and “opportunities to improve health and well-being are taken, in particular, to... ensure water sensitive design, address soil carbon management... so as to improve capacity for adaptability to the challenges of climate change, such as flood risk and increased temperatures”.</p> <p>Chapter 6, Section 6.4 Biodiversity and Ecological Networks, paragraph 6.4.3, states that development proposals must consider the need to: “safeguard protected species and species of principal importance and existing biodiversity assets from direct, indirect or cumulative adverse impacts that affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water, air and soil, including peat”.</p> <p>Chapter 6, paragraph 6.9.16 Land Contamination states that “Whenever development or re-development potential exists the planning system will be the preferred means of addressing potential land contamination.” 6.9.17 states that where land potentially meets the definition of contaminated land under Part 2A, the onus will remain with the developer to ensure that the land is suitable for its proposed use and would not meet the legal definition of contaminated land</p>

	<p>under Part 2A. Paragraph 6.9.19 states that “Where land contamination issues arise, the planning authority will require evidence of detailed investigation and risk assessment prior to the determination of the application” as well as “If contamination cannot be overcome satisfactorily, the authority may refuse planning permission.”</p>
<p>Local planning policy</p>	
<p>Caerphilly County Borough Council, Caerphilly County Borough Local Development Plan (LDP) up to 2021. Adopted November 2010</p>	<p>No specific policies in relation to soil or peat.</p> <p>A key objective of the LDP is to “encourage the re-use and/ or reclamation of appropriate brownfield and contaminated land and prevent the incidence of further contamination and dereliction”</p> <p>In relation to geodiversity, policy CW4 states that development proposals that affect locally designated natural heritage features, will only be permitted “within, or in close proximity to sites designated as ... Regionally Important Geological Sites (RIGS),, where proposals either: conserve and where appropriate enhance the ... geological importance of the designation, or are such that ... harm is minimised by mitigation measures and offset as far as practicable by compensation measures designed to ensure that there is no reduction in the overall value of the area or feature”.</p> <p>Minerals</p> <p>Policy SP8 relates to minerals safeguarding and states that the Council will contribute to regional demand for a continuous supply of minerals by “safeguarding known resources of coal, sand and gravel and hard rock”. “Proposals for permanent development uses within identified mineral safeguarding areas will not be approved unless:</p> <ul style="list-style-type: none"> i The applicant can demonstrate that the mineral is no longer of any value or potential value, or ii The mineral can be extracted satisfactorily prior to the development taking place, or iii There is an overriding need for the development, or iv The development comprises infill development within a built up area or householder development or an extension to an existing building.” <p>The Proposed Development site, and most of the land within the Caerphilly boundary, is located within a sandstone resource area shown on the local plan constraints map⁵⁵.</p>

Legislation

- Environmental Protection Act 1990
- Water Resources Act 1991 as amended by the Water Act 2003
- The Environmental Damage (Prevention and Remediation) (Amendment) (Wales) Regulations 2015
- Health and Safety at Work etc. Act 1974
- The Construction (Design and Management) Regulations 2015

⁵⁵ [Map: LDP Constraints Map \(opus3.co.uk\)](https://opus3.co.uk)

- Control of Asbestos Regulations 2012

BASELINE

- 5.7.4. Land within the Proposed Development Site boundary currently comprises predominantly agricultural fields and woodland. Farm buildings are present in the north-east corner of the Eastern Parcel and central area of the Western Parcel along with a series of access tracks. The site is within an area of historical coal mining activity. The site is situated on gently sloping ground along Cefn Rhyswg. Ground elevation ranges between 390m AOD in the east and 330m AOD in the west.
- 5.7.5. In the surrounding area, current land uses include agricultural, woodland, farm buildings, residential properties and tourism use associated with Cwmcarn Forest. Residential developments are present along the route of the A467 road to the west, at Pontywaun, Cwmcarn, Abercarn, and Newbridge. The Afon Ebwy river is beyond the A467 road to the west and runs roughly parallel to the road. In addition to coal mining, other industry has been present historically in the surrounding area in the form of quarries, including the large Hafod quarry approximately 1.4km to the north of the Site.
- 5.7.6. Information reviewed on the LandIS Soilscales map indicates that the soil type within the Proposed Development Site boundary predominantly comprises freely draining acid loamy soils over rock, with a loamy texture and medium carbon content. A very small part of the north-east corner of the Eastern Parcel is in an area shown as having very acid loamy upland soils with a wet peaty surface, a peaty texture and high carbon content.
- 5.7.7. The Peatlands of Wales map shows no peat onsite. Notwithstanding this, given the potential for peat to be present, a Phase 1 peat survey was undertaken in 2021 for the Eastern Parcel (as part of surveys associated with the proposed Trecelyn Wind Farm). The survey was carried out in accordance with best practice guidance document “Peatland Survey. Guidance on Developments on Peatland” which is published by the Scottish Government and NatureScot (there is no Welsh equivalent). The survey was on a 100m x 100m grid of points across land within the Scoping boundary with peat depth measurement taken at each survey point. A total of 143 probes across four site areas were completed and these found potential peat depths in the range of 0.0m to 0.1m. A copy of the survey report is included as **Appendix F**. The Welsh Government defines deep peat having a thickness of >0.4m organic material in the upper 0.8m of a soil profile, land within the Eastern Parcel of the Site boundary can therefore be considered as not being underlain by peat. The Western Parcel was not subject to the survey but is also likely to not be underlain by peat given the knowledge of the surrounding area.
- 5.7.8. The Predictive Agricultural Land Classification (ALC) Map indicates that the ALC within the Proposed Development is Grade 4 and 5. It therefore is not likely to include any ‘best and most versatile’ (BMV) land (categories 1, 2 or 3a). The Welsh Government only requires an agricultural land classification survey where the Predictive ALC Map identifies Grades 1, 2 or 3a.
- 5.7.9. The British Geological Survey (BGS) 1:50,000 scale mapping available on the GeoIndex, shows the bedrock underlying the Proposed Development site to be the Hughes Member Sandstone (Pennant Sandstone Formation). This comprises green-grey, lithic arenites with thin mudstone/siltstone and seatearth interbeds, and mainly thin coals.
- 5.7.10. The BGS 1:50,000 scale superficial geology mapping shows no superficial deposits on the Proposed Development site. To the south of the site Head (clay, silt, sand and gravel) and

Glaciofluvial Deposits (sand and gravel) are present. There are no BGS borehole records within the Proposed Development Site.

- 5.7.11. There are no Sites of Special Scientific Interest (SSSI) designated for geological or biological features within the Proposed Development site or within 1km Site. According to DataMap Wales, there are no Regionally Important Geological and Geomorphological Sites (RIGS) within the Proposed Development Site. Cwm Carn RIGS is located approximately 250m to the south west of the Western Parcel.
- 5.7.12. The Coal Authority Interactive map⁵⁶ shows the Proposed Development site is within a Coal Mining Reporting Area. The Coal Authority Interactive Map shows no mine entries within the Site boundary, however several are recorded in proximity in the Site, including one approximately 300m to the north and 700m to the south. No mine entry zones of influence are identified within the Proposed Development site; however several are present to the north of the Northern Parcel, with the nearest associated with the mine entries previously outlined. There are entries in the Abandoned Mines Catalogue for the Proposed Development Site. Areas identified as Development High Risk Areas are not shown within the Western Parcel or Eastern Parcel of the Proposed Development Site but do cross the proposed access route. The Proposed Development Site, as well as the surrounding land in Caerphilly, are within a surface coal resource area. No surface coal mining is recorded. There is one area of probable shallow coal mine workings is recorded approximately 1km to the south west of the Eastern Parcel. A Coal Authority Consultants Coal Mining Report (CCMR) was obtained for the Trecelyn Wind Farm site. This also covers the Eastern Parcel of the Proposed Development Site. This identifies coal seams worked beneath the CCMR boundary at depths of between 179m and 516m below ground level.
- 5.7.13. Information held by DataMap Wales does not show any historic landfill features within the Site.
- 5.7.14. Farm buildings and farming activities can be potential sources of land contamination due to the use of fuels and oils for farm vehicles, the use of pesticides, herbicides and fertilizers, ad hoc waste disposal and the presence of asbestos in buildings and sheds, which can release fibres to ground if in poor condition or during demolition. However, such sources are generally likely to be small-scale and localised.
- 5.7.15. The Hughes Member Sandstone underlying the Proposed Development site is classed as a Secondary A Aquifer. Further details of the hydrogeology on the Proposed Development site and in the surrounding area is provided in the Water Environment section (5.6).
- 5.7.16. Details of ecological receptors are provided in the Biodiversity section (5.4).

THE SCOPE OF THE ASSESSMENT

Potential Receptors

- 5.7.17. The principal Ground Condition receptors that have been identified as being potentially subject to effects are summarised in the table below:

⁵⁶ <https://datamine-cauk.hub.arcgis.com/>

Table 5-32 - Ground condition receptors subject to potential effects

Receptor	Reason for Consideration
Soil resources and agricultural land	<p>Land within the Proposed Development Site is predominantly in agricultural use but is not BMW.</p> <p>Peat survey has found that the Proposed Development Site is not underlain by peat, the soils present are therefore likely to be predominantly mineral soils.</p> <p>Key soil functions on the land include supporting crop growth, storage of organic carbon, providing habitat and supporting terrestrial biodiversity and a role in the hydrological cycle.</p>
<p>Humans – site users (agricultural workers, maintenance workers), public open space users)</p> <p>Humans – construction workers</p> <p>Humans - future site users (agricultural workers, maintenance workers/operatives (e.g., wind farm workers), public open space users)</p>	Potential for human health impacts to these receptors. Effects could occur either during construction or operation.
Controlled water - Groundwater – Secondary A aquifer (Hughes Member Sandstone)	Groundwater has been identified as a potential receptor due to the presence of a bedrock Secondary A aquifer and the likelihood that rockhead is shallow i.e., the aquifer is not protected by overlying superficial deposits. Effects on the water environment due to land contamination could occur either during construction or operation.
Controlled water; Surface water – tributaries of the Afon Ebwy river	Surface water has been identified as a potential receptor. Effects on the water environment due to land contamination could occur either during construction or operation.
Buildings and services	Potential for impacts on the built environment (future wind farm development) due to land contamination and due to land instability have been identified based on the presence of former mining activity and the presence of Development High Risk Areas within the Proposed Development site.

Likely Significant Effects

Table 5-33 - Likely significant ground condition effects

Activity	Effect	Receptor
<p>Construction activities:</p> <p>Use of plant and machinery, vehicle movements</p> <p>Excavation including temporary or permanent displacement of soil to</p>	<p>Permanent loss of soil and associated soil functions due to construction of the wind farm.</p> <p>Compaction of soil by vehicles or during stockpiling during construction leading to</p>	<p>Soils (topsoil and subsoil)</p> <p>Controlled waters: surface water</p>

<p>construct foundations and tracks or temporary tracks and hardstanding for cranes and compounds</p> <p>Temporary storage of water and dewatering activities</p>	<p>damage to soil structure resulting in damage to/loss of soil functions.</p> <p>Erosion of soil during construction, leading to loss of organic matter in runoff.</p> <p>Degradation of soil functions and agricultural land quality due to cross-contamination of topsoil with contaminated soil/material excavated/disturbed during construction work.</p>	
<p>Construction activities located on land potentially affected by contamination</p>	<p>Mobilisation of contaminants due to ground disturbance e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation or construction, failure to manage and segregate excavated materials appropriately</p>	<p>Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways)</p> <p>Controlled waters: groundwater and surface water</p> <p>Property (crops, grazing animals, built environment including services)</p> <p>Soil (topsoil and subsoil)</p>
	<p>Identification and remediation of contaminated land to allow the development to proceed</p>	<p>Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways)</p> <p>Controlled waters: groundwater and surface water</p> <p>Soil (topsoil and subsoil)</p>

5.7.18. The effects scoped out from further assessment in the EIA are:

- Potential effects on geology, due to the absence of sensitive geological receptors on the Proposed Development Site;
- Potential effects on best and most versatile agricultural land, due to the Predictive Agricultural Land Classification (ALC) Map 2 showing the absence of any land above Grade 4;
- Potential effects on land (or water) quality during the construction phase due to accidental release of contaminants (including oils, fuels, chemicals and waste) from construction plant or machinery or waste storage points e.g., accidental spillages or leaks, as these risks can be adequately managed through the Construction Environmental Management Plan (CEMP), and significant effects are, therefore, unlikely.

5.7.19. Impacts during decommissioning are likely to be like those during the construction phase. However, dependent on the exact nature of the decommissioning activities that take place, it is likely that ground disturbance would be less. Mitigation like that implemented during the construction and operational phases (updated to reflect changes in legislation/guidance) should also help to ensure

that the significance of such impacts is minimised. It is therefore proposed that consideration of decommissioning effects is 'scoped out' from detailed assessment in the EIA.

- 5.7.20. The stability of the ground, in so far as it affects land use, is a material consideration that is taken into consideration in planning application decisions. Land stability in relation to the ground conditions on the Proposed Development site will be addressed throughout the design and construction process by compliance with the Construction (Design and Management) Regulations 2015 and will be informed by the coal mining report, the Phase 1 peat depth survey, and any further relevant surveys undertaken. It will not be considered further during the EIA process.

ASSESSMENT METHODOLOGY

General Approach

- 5.7.21. This section describes the approach for the assessment of the ground condition related effects of the Proposed Development on receptors. The proposed approach will be confirmed with Natural Resources Wales (NRW) and the local planning authority (LPA) during the next stages of the EIA.

Land Contamination Approach

- 5.7.22. The effect of the Proposed Development will be assessed through desk-based studies to understand the baseline environment relevant to soil, geology and contamination status. Consultations with NRW and the LPA will be undertaken to obtain more local detailed information.

Risk Assessment

- 5.7.23. With respect to potential contaminated land, the process of managing land contamination, as set out in the Environment Agency guidance Land Contamination: Risk management (LCRM), is based on risk assessment. The assessment of risks from contaminated land is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of a:

- Source of contamination;
- Receptor that can be adversely affected by the contamination; and
- Pathway capable of exposing a receptor to the contaminant.

- 5.7.24. The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following:

- The magnitude of the potential consequence (for instance, severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- The magnitude of probability (for instance, likelihood). It takes into account both the presence of the hazard and receptor and the integrity of the pathway.

- 5.7.25. The definitions for the qualitative risk assessment have been taken from "Guidance for the Safe Development of Housing on Land Affected by Contamination" Annex 4 R&D Publication 66: 2008 Volume 2. These are based upon CIRIA C552⁵⁷.
- 5.7.26. The magnitude of the potential consequence of a contaminant linkage gives an indication of the sensitivity of a given receptor to a particular source or contaminant of concern under consideration. It is based on full exposure via the linkage being examined. It is important that the assessment and classification of risk is carried out prior to environmental measures being embedded into the development proposals. This then allows the environmental measures to be targeted at the risks and the assessment of significance of the change in risk resulting from the Proposed Development to be carried out with the measures embedded to be consistent with approach used in respect of other environmental topic assessments.
- 5.7.27. Where a risk classification of moderate or greater has been determined, it is considered that the source–pathway–target contaminant linkage requires some form of risk management or intervention. As the first step, such risk management or intervention would normally take the form of either further investigation, with the additional knowledge gained allowing the risk to be more accurately assessed and potentially the classification may be lowered. However, if the risk classification remains at moderate or above then remediation, in the form of embedded mitigation, may be required to reduce or remove the source of contamination or disrupt the pathway to the target or receptor.

Significance Evaluation Methodology

- 5.7.28. To use risk assessment as the basis for the evaluation of the significance of effects in relation to land contamination, it is necessary to evaluate the change in risk from baseline conditions to those during and following the Proposed Development. In order to define the baseline risk the initial assessment and classification of risk is carried out for the study area in its pre-development state. A separate assessment of risk will then be conducted for the site post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Development.
- 5.7.29. Guidance on the protection of the environment will be used to assist with the development of mitigation e.g. NRW and CIRIA. The assessment will be based on the implementation of those mitigation measures identified, which will feed into the construction environmental management plan (CEMP), method statements and procedures for the Proposed Development. These will cover the control of drainage runoff from excavations and access tracks and the formation of turbine footings. These measures will reflect current best practice in the industry and will serve to prevent increases in pollution and sediment-loading.
- 5.7.30. The Environmental Statement chapter will summarise the findings of the desk study and ground investigation, this forming the baseline against which the potential impact of the Proposed Development, alone and cumulatively with other developments, would be assessed. The assessment will be based on both receptor importance and the nature and magnitude of the impact

⁵⁷ CIRIA (2001) C552 Contaminated Land Risk Assessment, A Guide to Good Practice

as a result of the Proposed Development and all mitigation considered necessary will be identified and residual effects with this in place will be determined.

Soils Approach

- 5.7.31. The magnitude / consequence of the loss or damage to soil resources is based upon the:
- Likely nature and scale of soils effects (positive, neutral or negative) during the construction and the operational phases of the project;
 - Likelihood of the Proposed Development to result in significant effects;
 - Issues requiring further assessment and the methods to be applied.
- 5.7.32. The approach to assigning levels of sensitivity will be based on the Design Manual for Roads and Bridges (DMRB) LA 109 guidance⁵⁸. The approach to assigning the consequence of any damage or loss will be based on the DMRB LA 109 guidance.
- 5.7.33. The determination of significance will combine the sensitivity and magnitude using the matrix presented in **Table 5-34**. Where professional judgement is applied in assigning a sensitivity or magnitude (e.g., in relation to peat, which is not referred to directly in the DMRB LA 109 guidance), this will be clearly defined, and the resulting assessment conclusions clarified in the EIA reports.

Table 5-34 - Soil effects significance evaluation matrix

		Magnitude of change				
		No change	Negligible	Minor	Moderate	Major
Sensitivity/ importance/ value	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

⁵⁸ 2 Highways England, (2019), Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 109 Geology and Soils <https://www.standardsforhighways.co.uk/dmrB/search/adca4c7d-4037-4907-b633-76eae30b9c0>.

5.7.34. Note: Significant effects are those identified as ‘Very large’ or ‘large’. ‘Moderate’ effects have the potential to be significant, and they would normally be deemed to be significant, however in some instances these are deemed to be acceptable based on professional judgment.

Assumptions

5.7.35. The scope of the assessment is based on a high-level review of available desk-based information and will be confirmed through further desk-based review and surveys, including a geo-environmental desk study.

5.8 TRAFFIC AND TRANSPORT

5.8.1. The traffic and transport assessment will include all transport routes associated with the Proposed Development and will consider the impact of the construction, operational and decommissioning phases on the transport haulage routes.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

5.8.2. **Table 5-35** outlines the policy relevant to traffic and transport for the Proposed Development. The table also includes commentary on the implication of the policy with respect to the scope of the EIA.

Table 5-35 - Planning policy relevant to traffic and transport

Policy	Policy context
National planning policy	
Future Wales: The National Plan 2040 (2021) ⁵⁹	<p>This document sets out the national development framework for Wales to 2040. One of the desired outcomes is sustainable transport. Another involves achieving efficient transport infrastructure and a third involves investment in public and active travel.</p> <p>Policies 11 and 12 cover national and regional transport connectivity policy.</p>
Planning Policy Wales, Edition 12, Welsh Government (2024) ⁶⁰	<p>5.3 Transportation Infrastructure</p> <p>This section outlines the need to ensure any new transport infrastructure has minimal adverse impacts including expectation that routing takes into account various impacts including safety and noise.</p> <p>Strategic Road Network</p> <p>This includes policy that development plans should cover the road network hierarchy and any associated network improvements or new schemes. It also states that where possible site access should not be onto a primary road and should be onto a secondary road; and that the type of access should reflect the road and traffic characteristics and incorporate good junction design.</p>

⁵⁹ Welsh Government. (2021). Future Wales: The National Plan 2040 (Online) Available at: <https://gov.wales/future-wales-national-plan-2040-0>

⁶⁰ Welsh Government (2021). Planning Policy Wales (Online). Available at: [Planning Policy Wales - Edition 12 \(gov.wales\)](https://gov.wales/planning-policy-wales-edition-12) [Accessed August 2024].

	<p>Freight</p> <p>This section outlines the expectation that development plans and local authorities should consider the most appropriate routes for freight movements, where this is necessary by road, rather than the encouraged rail and water movements.</p>
Llwybr Newydd The Wales Transport Strategy (2021) ⁶¹	<p>Priority 2 an efficient, sustainable and accessible transport system including safe and efficient use of current infrastructure.</p> <p>Mini Plan 7.4 This plan outlines priorities and aims for the road and streets including ensuring the Strategic Road Network has minimal environmental impacts, roads work efficiently and with reduced congestion and that the network is safe, with fewer incidents, for all users.</p> <p>Mini Plan 7.7 This plan covers priorities for freight movements including a desire to shift freight movements away from the road network, decarbonise the sector and contribute to the aim of a safe transport network for all users with reduced impact on the environment.</p>
The Wales Freight Strategy Freight Strategy (2008) ⁶²	<p>This document sets out the freight strategy for Wales outlining aims and policies across multiple modes. It includes three key themes of measures for reducing demand for freight movements, modal shift from road to rail/sea and making efficient use of the existing network. It outlines that road freight is a less preferred option due to some of the road network not being suited to freight movements. However, the Strategy recognises that sometimes the use of the road network for freight transport is the only option available.</p> <p>The Strategy focuses on ‘steps towards delivery’ overall and for each mode. There are 9 road steps including the need to improve the efficiency of road freight, consideration of parking and identifying of strategic routes for freight. These 9 road steps are to contribute to various outcomes including those relating to safety, severance/intimidation and environmental impacts along with economic benefits.</p>
Local planning policy	
South East Wales Valleys Local Transport Plan (2015) ⁶³	<p>Vision: The Plan’s vision is a ‘modern, accessible, integrated and sustainable transport system’ through active and sustainable travel including sustainable freight movements.</p> <p>Objectives 1, 2, 7, 8 and 10: These objectives aim to reduce road traffic casualties; improve travelling security; reduce traffic growth and congestion by utilising the road system efficiently; increase sustainable freight transport and reduce the impact of transport on local areas.</p>

⁶¹ Welsh Government (2021). The Wales Transport Strategy (Online). Available at: <https://gov.wales/llwybr-newydd-wales-transport-strategy-2021>

⁶² Welsh Government. (2008). The Wales Freight Strategy. (Online) Available at: <https://gov.wales/wales-freight-strategy>

⁶³ Welsh Government (2015). South East Wales Valleys Local Transport Plan (Online). Available at: <https://www.blaenau-gwent.gov.uk/en/council/policies-plans-strategies/south-wales-valleys-local-transport-plan-2015-2020/> [Accessed November 2023].

	<p>Issues 12, 13, A and B: The key relevant issue of concern in this plan covers congestion levels, the inadequacy of freight routes on the strategic network, pollutions from transport and highway accident levels.</p> <p>Medium and Long Term Programme: This outlines schemes up to 2030 including highways improvements focusing on network resilience and accessibility, including the A4046, further cycle route expansions and bus rapid transit developments. No design work was specified in the Local Transport Plan.</p>
<p>Caerphilly County Borough Local Development Plan up to 2021 (adopted 2010)⁶⁴</p>	<p>Key Objective 16 to reduce congestion levels, 'through efficient use of the road network.</p> <p>SP20 Outlines the road network hierarchy to ensure traffic is routed appropriately for environmental and safety reasons.</p> <p>CW1 This county wide policy sets out key criteria for proposals for transport with a certain level of trips generated that freight trips are routed along the least environmentally damaging route by the least environmentally damaging mode.</p> <p>CW3 Sets out county wide highway requirements including safety and efficiency on the highway network and appropriately designed access points onto the network.</p> <p>Strategy Area 2: Sets out sub area policies covering the A472's capabilities and efficiency.</p> <p>TR1.11 Covers land requirements for improvements to the cycle network including in the vicinity of Crumlin.</p>
<p>Torfaen County Borough Council Local Development Plan up to 2021 (adopted 2013)⁶⁵</p>	<p>LDP Objective 17 to develop integrated and efficient transport infrastructure which is accessible and attractive to all, and encourage a reduction in private car use.</p> <p>Paragraph 4.2.29 sets out the road hierarchy in Torfaen. The A472 is identified as a strategic route.</p> <p>BW1 identifies criteria against which all development proposals will be considered. Part (E) of the policy seeks to ensure that the road network is capable of safely and effectively sustaining the scale and nature of additional traffic generated by the proposal. Where a significant number of freight trips will be generated, it will need to be demonstrated that the least environmentally damaging transport mode and route will be utilised.</p>

Technical guidance relevant to the traffic and transport assessment

- Environmental Assessment of Traffic and Movement (EATM) (Institute of Environmental Management and Assessment, 2023)

⁶⁴ Caerphilly County Borough (2010) Caerphilly County Borough Local Development Plan up to 2021 (Online) Available at: [https://www.caerphilly.gov.uk/Business/Planning-and-building-control-for-business/Local-Development-Plan/Local-Development-Plan-2010-\(Adopted\)](https://www.caerphilly.gov.uk/Business/Planning-and-building-control-for-business/Local-Development-Plan/Local-Development-Plan-2010-(Adopted)) [Accessed November 2023].

⁶⁵ [Adopted-Torfaen-LDP-Written-Statement.pdf](#)

BASELINE

Current Baseline

- 5.8.3. The sections of the road network included within the assessment will be determined on the basis of the potential effect of increased traffic associated with the Proposed Development on identified sensitive receptors.
- 5.8.4. The chosen Study Area will encompass travel routes to the north, east, south and west to most strategic destinations. However, it is likely that once origin information is known the Study Area could be refined.
- 5.8.5. At this stage, it is assumed that construction material for the Proposed Development will be sourced from a local quarry. There are number of quarries located north, south and west of the Site. On this basis, it is assumed that the A467 would be the key access route which would be used for the Proposed Development.
- 5.8.6. It is anticipated that the Abnormal Indivisible Loads (AILs) related to the turbines will travel by road from either the Port of Swansea or Avonmouth. The Port of Swansea, which is the closest port in the region capable of handling wind turbine equipment. The Port of Swansea has been frequently used for the delivery of wind turbine components in this region, for example being the selected port of entry for the Brechfa Forest Wind Farm, located to the north of Carmarthen. Avonmouth is an alternative port location and has been identified as a preferred port for the nearby Trecelyn Wind Farm in the ES AIL access study. The AIL routes and related measures for Rhyswg Wind Farm will be identified in the AIL access study after determining the type of wind turbines and transporters.

THE SCOPE OF THE ASSESSMENT

- 5.8.7. Based on professional experience and an understanding of the nature of the Proposed Development, it is expected that the majority of traffic movements will be generated during the construction phase.
- 5.8.8. Once operational, it is envisaged that the amount of traffic movements associated with the Proposed Development would be minimal. Occasional visits may be made to the Site for maintenance checks. The vehicles used for these site visits are likely to be 4x4 or similar and there may be an occasional need for a heavy goods vehicle (HGV) to access the site for maintenance and repairs.
- 5.8.9. It is considered that the effects of operational traffic would be negligible, and it is therefore proposed that the assessment of the operational phase of the development is 'scoped out' from detailed assessment in the EIA.
- 5.8.10. On the assumption that below ground infrastructure and access tracks will remain in situ, less traffic will be generated during decommissioning than during construction. Even if tracks were to be removed, less traffic would be generated during this phase than during this phase than operation. The traffic baseline is likely to be different (typical trend of annual increases in background traffic) to the current baseline traffic conditions when decommissioning is undertaken after the 30-year operational phase. The effects on the road network are likely to be similar in nature, though of lower magnitude, than that relating to the construction phase as fewer vehicle movements would be required (for example stone for tracks left in situ or turbine bases left in situ create less vehicle movements).

- 5.8.11. Given the above, it is proposed that the assessment of traffic and transport effects during the decommissioning phase of the development is 'scoped out' from detailed assessment the EIA.
- 5.8.12. The main transportation effects will be associated with the movements of commercial HGVs travelling to and from the Site during the construction phase of the Proposed Development. This will be subject to detailed assessment in the Environmental Statement.

Potential Receptors

- 5.8.13. The roads likely to be impacted as a result of traffic movements associated with the Proposed Development will be assessed once the final HGV routing is known. Receptors identified along the haul roads will form the scope of the assessment in relation to potential traffic-related effects. Receptors are users or beneficiaries of highway network assets and facilities, such as pedestrians, cyclists, equestrians and drivers who travel within the vicinity of the Proposed Development.
- 5.8.14. The EATM guidance identifies the following groups and special interest groups that may be affected:
- People at work;
 - Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors),
 - Locations with concentrations of vulnerable users (e.g., hospitals, places of worship, schools),
 - Retail areas,
 - Recreational areas,
 - Tourist attractions
 - Collision clusters and routes with road safety concerns, and
 - Junctions and highway links at (or over) capacity.

Likely Significant Effects

The likely significant traffic and transport effects that will be taken forward for assessment in the ES are:

- Severance of communities;
- Road vehicle driver and passenger delay;
- Non-motorised user delay;
- Fear and intimidation on and by road users;
- Road user and pedestrian safety.

ASSESSMENT METHODOLOGY

- 5.8.15. The guidance used when assessing the potential significance of road traffic effects is summarised in EATM. To assess the impact at its peak, the likely percentage increase in traffic is determined by comparing estimates of traffic generated by the Proposed Development with future predicted baseline traffic flows on the roads used by construction traffic in vicinity of the site.

Determination of Significance

- 5.8.16. The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are "likely to be significantly affected by the development".

- 5.8.17. The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.
- 5.8.18. EATM provides two rules that are used to establish whether an environmental assessment of traffic effects should be carried out on receptors:
- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
 - Rule 2: Include sensitive areas where traffic flows are predicted to increase by 10% or more.
- 5.8.19. EATM outlines that predicted traffic flow increases which are below 10% are generally not considered to be significant as daily variations in background traffic flow may fluctuate by this amount. Therefore, changes in traffic flows below this level will not be assessed. Consideration will, also, be given to the duration of the impact within the assessment. The assessed traffic movement volumes generated by the proposed development are expected to be the worst-case scenario.
- 5.8.20. The main transportation impacts associated with a wind farm relate to the construction phase of the development. This would include the movement of HGV traffic travelling to and from a site bringing in material for the construction of the access, tracks, foundations, crane pad hard standing etc. The assessment will identify the number of HGV movements required for the Proposed Development.
- 5.8.21. Other construction impacts relate to the delivery of the turbine components. These components, by their nature are large and require abnormal load delivery. The assessment will identify the number of abnormal loads required for the Proposed Development.
- 5.8.22. The assessment will include the identification of the baseline data through relevant survey information for all the roads associated with the different elements of the Proposed Development. The assessment will identify the:
- Existing traffic flows;
 - Potential impacts (of changes in traffic flows) on local roads;
 - Potential impacts (of changes in traffic flows) on users of those roads; and
 - Potential impacts (of changes in traffic flows) on land uses and environmental resources and sensitive receptors fronting those roads, including the relevant occupiers and users.
- 5.8.23. **Table 5-36** summarises the rationale used to determine the sensitivity against the corresponding receptors as part of the assessment as contained in the EATM. Professional judgement is also used to determine the sensitivity of the receptor.

Table 5-36 - Receptor sensitivity

Sensitivity	Description / Reason	Receptor
High	Schools, colleges, playgrounds, accident cluster areas, retirement homes, urban/residential roads without footways that are used by pedestrians and cyclists	Occupants of land-uses alongside the highway link and users of the highway link

Medium	Congested junctions/highway links, places of worship, doctors' surgeries, hospitals, retail with highway frontage, roads with narrow footways, unsegregated cycleways, tourist attractions, community centres, parks and recreation facilities	Occupants of land-uses alongside the highway link and users of the highway link
Low	Places of worship, public open space, nature conservation areas, listed buildings, tourist attractions and residential areas with adequate footway provision	Occupants of land-uses alongside the highway link and users of the highway link
Negligible	Receptors with negligible sensitivity to traffic flows and receptors sufficiently distant from affected roads and junctions and no/very limited numbers of pedestrians/cyclists	Users of the highway link

- 5.8.24. The sensitivity of each highway link included in the assessment will be assigned a sensitivity. Sensitivity judged as 'High' or 'Medium' results in Rule 2 (sensitive areas where traffic flows are predicted to increase by 10% or more) being considered for that link. Sensitivity judged as 'Low' or 'Negligible' results in Rule 1 being considered for that link where traffic flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%.
- 5.8.25. EATM recognises that professional judgement should be used as part of the assessment. Based on the Rule 1 and Rule 2 and the sensitivity of the receptors, **Table 5-37** shows the magnitude of change applied to the environmental effects to help identify levels of significance. The indicators to assess the magnitude of change are based on advice included within EATM and professional judgement.

Table 5-37 - Magnitude of change

	Magnitude of change			
Transport effect	High	Medium	Low	Negligible
Severance	Change in total traffic or HGV flows over 91%.	Change in total traffic or HGV flow of 61-90%.	Change in total traffic or HGV flows of 31-60%.	Change in total traffic or HGV flows of less than 30%.
Context should also be considered including population and facilities impacts. EATM states caution should be applied with applying these thresholds to highway links with low baseline blows.				
Driver delay	High increase in queuing at junctions and/or	Medium increase in queuing at junctions and/or	Low increase in queuing at junctions and/or	Low or no increase in queuing at junctions and/or congestion on road links.

	congestion on road links.	congestion on road links.	congestion on road links.	
Non-Motorised users	A halving or doubling of traffic flow (of HGV flow) can be used as a broad threshold when considered in the local context and applied with caution. Assignment based on a variety of factors including general level of pedestrian activity, visibility and physical conditions such as traffic flow, traffic composition, crossing points and pavement width/separation from traffic. EATM also advises consideration of factors included in the Transport for London's Healthy Streets Indicators.			
Non-motorised user delay	Assessed based on pedestrian delay experienced when crossing highways links considering a range of factors including crossing type, pedestrian flows, traffic levels, visibility and general highway condition.			
Fear and Intimidation	Assigned based on the levels scoring systems provided in EATM (which is dependent on 18hr average traffic flow; 18hr average HGV traffic flow and vehicle speed) extreme 71+; great (41-70); moderate (21-40) and small (0-20)			
	Two step change in level score of fear and intimidation	change in level score of fear and intimidation and >400 average 18hr vehicle increase or >500 HGV 18hr vehicle increase.	One step change in level score of fear and intimidation and <400 average 18hr vehicle increase or <500 HGV 18hr vehicle increase.	No change to step in level score of fear and intimidation
Road safety	Assignment informed by a review of existing collision patterns and trends based upon the existing personal injury accident records and the forecast increase in traffic.			

5.8.26. The classification of a likely Traffic and Transport effect is derived by considering the sensitivity of the receptor against the magnitude of change. The shading indicates those significance ratings that are deemed to be 'significant' effects.

Table 5-38 - Significance evaluation matrix

		Receptor sensitivity				
		Very High	High	Medium	Low	Negligible
Nature of Impact (Magnitude / Probability / Reversibility etc)	Very High	Substantial (Significant)	Substantial (Significant)	Substantial (Significant)	Moderate (Significant)	Minor (Not significant)
	High	Substantial (Significant)	Substantial (Significant)	Substantial (Significant)	Moderate (Significant)	Negligible (Not significant)

	Medium	Substantial (Significant)	Substantial (Significant)	Moderate (Significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Significant)	Moderate (Significant)	Minor (Not significant)	Minor (Not significant)	Negligible (Not significant)
	Negligible	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

5.8.27. Major and Moderate effects are considered to be significant, whilst Minor and Negligible effects are considered to be not significant.

5.8.28. Consideration will also be given as to whether any of the receptors which would be taken forward for assessment are likely to be subject to cumulative effects because of the Traffic and Transport effects generated by other proposed developments, and if this is likely to be the case a cumulative assessment would be undertaken.

Assumptions

5.8.29. The scope of the assessment is based on a desk-based review of currently available information and will be confirmed through review of additional data sources and consultation with stakeholders during the next stages of the EIA.

5.9 NOISE

5.9.1. This chapter describes the proposed scope of the assessment of effects with respect to noise arising from the Proposed Development.

5.9.2. The proposed scope of the noise assessment would consist of an assessment of the noise effects arising from construction and operation of the Proposed Development, including cumulative noise impacts from proposed, consented and operational wind energy developments in the area.

RELEVANT POLICY, LEGISLATION AND GUIDANCE

5.9.3. **Table 5-39** outlines the policy relevant to noise for the Proposed Development. The table also includes commentary on the implication of the policy with respect to the scope of the EIA.

Table 5-39 - Planning policy relevant to the noise assessment

Policy	Policy context
National planning policy	

Future Wales – The National Plan 2040 ⁶⁶	Provides the national development framework up to 2040 and refers to the protection from noise through planning throughout, including renewables. Identifies an area containing the Proposed Development as a pre-assessed area for wind energy development.
Planning Policy Wales ⁶⁷	PPW sets out the land use planning policies of the Welsh Government, supplemented by Technical Advice Notes (TANs). It notes that ‘Wales has an abundant wind resource and, as a result, wind energy forms a key part of meeting the Welsh Government’s vision for future renewable energy production.’ Paragraph 6.7.15 includes a reference to ETSU-R-97 as good practice guidance on wind turbine noise assessments.
Welsh Assembly Government: Technical Advice Note (TAN) 11: Noise (1997) ⁶⁸	TAN 11 provides general advice on noise and refers to TAN 8 ⁶⁹ for guidance regarding noise from wind turbines and wind farms. TAN 8 has now been superseded by national development framework embedded within ‘Future Wales’.
Local planning policy	
Caerphilly County Borough Local Development Plan to 2021 (November 2010) ⁷⁰	LDP Policy CW2 – Amenity states that development proposals must have regard for all relevant material considerations to satisfy the requirement that there is no unacceptable impact on the amenity of adjacent properties.

Legislation

- The Town and Country Planning Act 1990
- Environmental Protection Act 1990, Part III – as amended by the Noise and Statutory Nuisance Act 1993
- Control of Pollution Act 1974

Technical guidance relevant to the noise assessment

- ETSU-R-97 The Assessment and Rating of Noise from Wind Farms, The Working Group on Noise from Wind Turbines (1996);
- A Good Practice Guide (‘IOA GPG’) to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, Institute of Acoustics (2013);

⁶⁶ Welsh Government (2021). Future Wales. The National Plan 2020. (Online) Available at: <https://gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf>

⁶⁷ Welsh Government (2024) Planning Policy Wales Edition 12. (Online) Available at: [Planning Policy Wales - Edition 12 \(gov.wales\)](https://gov.wales/sites/default/files/publications/2024-09/planning-policy-wales-edition-12.pdf)

⁶⁸ Welsh Assembly Government (1997). Technical Advice Note 11: Noise. (Online) Available at: <https://gov.wales/sites/default/files/publications/2018-09/tan11-noise.pdf>

⁶⁹ Welsh Assembly Government (2005). Technical Advice Note 8: Planning for Renewable Energy. (Online) Available at: https://gov.wales/sites/default/files/publications/2018-09/tan8-renewable-energy_0.pdf

⁷⁰ Caerphilly County Borough Council. Local Development Plan up to 2021. Adopted November 2010. (Online) Available at: <https://www.caerphilly.gov.uk/caerphillydocs/ldp/written-statement.aspx>

- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, BSI (2014);
- Calculation of Road Traffic Noise (CRTN); and
- Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration.

BASELINE

Data Sources

- 5.9.4. The primary data source used to inform this section is aerial imagery from Google Earth which was used in combination with the preliminary layout for the Proposed Development.

Study Area

- 5.9.5. The study area for scoping is based on a radius of 10 km from the Proposed Development.
- 5.9.6. Within the 10 km study area, other wind farm developments (including those that are consented but not built or at planning stage) would be considered during the EIA process as part of the assessment of cumulative effects. It will be assessed whether these other wind farms would have a significant contributory effect on noise levels at residential receptors most affected by the Proposed Development.

Current Baseline

- 5.9.7. The Proposed Development is located in a semi-rural area, bordering the town of Abercarn. The most notable likely existing noise sources are road traffic on the A467 – approximately 315m to the west of the Proposed Development Site boundary.
- 5.9.8. There have been no recent surveys undertaken to quantify baseline conditions. If required, as a result of initial screening assessments, a programme of baseline measurements would be taken to inform the EIA.

Future Baseline

- 5.9.9. It is unlikely that the future baseline will alter markedly in the short to medium term as many of the potential forces for change within and around the Proposed Development are in relative stasis. Wind energy developments that are relevant to the cumulative assessment i.e. located within the edge of the 10 km study area, including those that are consented but not built or are at planning stage will be taken into consideration.

THE SCOPE OF THE ASSESSMENT

Potential Receptors

- 5.9.10. By reviewing the Proposed Development and surrounds using current Aerial Photography, the following Noise Sensitive Receptors could potentially be significantly affected by wind turbine noise (all distance approximate). Please note that this will be refined further and confirmed following discussions with consultees and as the EIA progresses:
- Cluster of four dwellings located between the Western Parcel and Eastern Parcel approximately 150m to the west of the Eastern Parcel and 50m of the Western Parcel – Bwthyn Mamgu, Rhyswg Fawr Farmhouse, Stabal To Carreg and Tri Carreg;
 - Cefn Rhyswg Farm dwelling located within the Western Parcel;
 - Dwellings along Gwyddon Road, approximately 650m to the north of the Eastern Parcel;

- Dwellings in Abercarn, which is located approximately 400m to the west of the Western Parcel;
- Dwellings in Cwmcarn, located approximately 400m to the south of the Western Parcel.

Likely Significant Effects

5.9.11. The following aspects are scoped into the EIA on the basis of their potential for resulting in significant adverse effects.

Table 5-40 - Potential significant noise effects

Activity	Effect	Receptor
Impact piling (if required as part of the construction of the Development)	Noise disturbance to receptors in the area of activities	Nearest Sensitive Receptors
Construction traffic movements	Disturbance to receptors on the construction traffic route	Nearest Noise Sensitive Receptors along construction traffic route
Operational turbine noise	Noise disturbance from wind turbine	Nearest Noise Sensitive Receptors

5.9.12. Aerodynamic noise occurs from the movement of the wind turbine blades passing through the air. At higher wind speeds, aerodynamic noise is usually masked by the increasing sound of wind blowing through trees and around buildings. The level of masking determines the perceived audibility of the wind farm. The proposed impact assessment establishes the relationship between wind turbine noise and the natural masking of noise resulting from features of the surrounding environment and assesses noise levels against established standards. The scoping in of a full operational noise assessment will be dependent on an initial screening assessment based on exceedances of the 35 dB LA90 daytime limit of ETSU-R-97. If a full noise assessment is not deemed to be required, the screening assessment will be included within the ES. The effects scoped out from the further assessment in the ES are:

- Blasting would be very unlikely, however, if any blasting is to occur it would be controlled via a blasting management plan as part of a planning condition requirement;
- Noise emissions from construction activities other than piling (including vehicles on haul routes, but not on existing roads) are unlikely to be high enough, given the distance of the Proposed Development to Noise Sensitive Receptors, to warrant a noise assessment. However, planning conditions regarding standard times of work should apply;
- Operational traffic noise during the operation of the Proposed Development is scoped out as the amount of traffic associated with development operation would be minimal;
- The effects of decommissioning on any Noise Sensitive Receptors are likely to be similar in nature but of lower magnitude than those during the construction phase. As a result, it is not proposed to assess the decommissioning phase of the development in addition to that of the construction phase;
- Construction of the grid connection - Whilst there would be some construction noise associated with the grid connection at nearby residences, this would be temporary in nature. It is unlikely that the construction works associated with these connections would last for more than 10 days within any consecutive 15 or for a total number of days exceeding 40 in any 6 consecutive months, and

therefore noise effects due to the construction at the grid connection has been scoped out from further assessment.

ASSESSMENT METHODOLOGY

- 5.9.13. The main objective of the noise assessment is to compare baseline noise levels in the study area to those that would exist should the development proceed and to determine the acceptability for relevant Noise Sensitive Receptors. In this case, such receptors are restricted to those living in residential properties close to elements of the development.
- 5.9.14. The ES will present a review of relevant policy and how it guides the noise assessment, the results of any noise measurements undertaken, and finally the assessment of noise predictions against noise limits.

Construction Noise

- 5.9.15. Construction noise from piling would be predicted and assessed in accordance with 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1 – Noise.
- 5.9.16. The noise impact from construction traffic on receptors along the local road network would be predicted using the methodology within Calculation of Road Traffic Noise (1998). The difference between the existing traffic flows and 'with development' traffic flows would be assessed using the magnitude criteria within the Design Manual for Roads and Bridges 'LA 111 – Noise and Vibration' (2020).
- 5.9.17. In most cases, construction noise (including construction traffic) is controlled through the implementation of mitigation measures (such as limiting hours during which construction can be undertaken via a planning condition), and undertaking construction works in accordance with good practices as described in BS 5228-1:2009 + A1:2014 (such as using well maintained and serviced plant, and the appointment of a Site contact to whom complaints/queries can be directed).

Operational Noise

- 5.9.18. The proposed operational noise assessment would be undertaken in accordance with ETSU-R-97: The Assessment and Rating of Noise from Wind Farms (ETSU-R-97 Guidance, 1996) and the assessment methodology advocated within the Institute of Acoustics: A Good Practice Guide to Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (IoA GPG, 2013).
- 5.9.19. If the screening identifies a need for a full ETSU-R-97 assessment, an understanding of the change in background noise levels with wind speed at receptors is required to provide the necessary criteria. This is achieved by monitoring background noise levels at sensitive receptors and simultaneously measuring the variation in wind speed and direction at the wind farm site, using either a >50m met mast with anemometers at dual heights, or by a LiDAR or SoDAR system. Noise and wind speed measurements are taken as a series of simultaneous 10-minute averaged measurements, over a period of at least two weeks. From this data, regression analysis is performed to determine typical background noise levels for each receptor across a range of wind speeds (4m/s – 12m/s).
- 5.9.20. Noise limits are defined separately for daytime and night-time. During daytime periods (represented by measurements during the 'quiet' daytime of 18:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00-23:00 Sundays), noise limits are as follows:
- 5dB above the background noise curve in this period for wind speeds up to 12 m/s;

- Where background noise levels are below 30 - 35 dB LA90,10 min, the lower limit should be fixed at 35 - 40 dB; and
- For properties with a financial interest in the scheme, the lower limit is fixed at 45dB.

5.9.21. For night-time periods (23:00 - 07:00 every day), noise limits are as follows:

- 5dB above the background noise curve in this period for wind speeds up to 12 m/s;
- The lower limit is fixed at 43 dB; and
- For properties with a financial interest in the scheme, the lower limit is fixed at 45dB.

5.9.22. For the cumulative assessment, the quiet daytime lower limit will be set at 40dB.

5.9.23. The initial screening noise modelling will be used to identify locations in the event a baseline noise survey is required. These locations will be agreed with the relevant Environmental Health Representative at the Local Planning Authority. Measurements at the chosen monitoring locations will depend upon arranging access to the properties.

5.9.24. Noise modelling would be undertaken using software adopting methodologies advocated by the Institute of Acoustics Good Practice Guide. The assessment will take into account shear and issues regarding low frequency noise, tonality and amplitude modulation. A cumulative noise assessment will be included within the EIA. This assessment will identify other wind turbine developments (operational, consented, or subject to an application) in the area that may impact on sensitive receptors together with the Proposed Development. A cut-off date for the assessment will be identified in the ES and a list of wind turbine developments identified for the cumulative assessment will be created.

5.9.25. The majority of noise related guidance and standards (including the ETSU guidance) are not directly related to the concepts of 'significant' and 'not significant' effects that underpin EIA. However, for the purposes of the assessment, the determination of effect significance for the operational phase of the Proposed Development is based upon compliance with the applicable noise limit i.e. a breach of noise limits indicates a significant effect, whereas compliance with noise limits indicates an effect which is not significant.

5.9.26. As noise levels exceeding the ETSU guidance noise limits are deemed to be significant, they would require further consideration, with a view to identifying appropriate mitigation to ensure compliance with the specified limits. These may include adoption of quieter turbines, reducing the power rating, and thus the noise emission of particular turbines in particular wind environments; or design of a noise management plan which varies the operation of the wind turbines depend on the wind direction.

5.10 INFRASTRUCTURE AND OTHER ISSUES

EXISTING INFRASTRUCTURE, TELECOMMUNICATIONS AND BROADCAST SERVICES

5.10.1. The ES will consider the potential effects of the proposed wind farm on existing infrastructure, television, aviation, and radar and radio-communication signals.

5.10.2. During the preparation of the ES the responses of consultees will be collated and reported to the design team. The consultees will be identified from the contact details provided within (the now revoked) TAN 8. Should infrastructural constraints be identified, revision to the turbine layout may be

necessary to avoid electronic interference or disruption to services. Technical solutions to any infrastructural constraint will be sought during this process to minimise effects upon it.

SHADOW FLICKER

- 5.10.3. Shadow Flicker is a phenomenon that can occur in sunny weather when turbines are operating and the rotating blades cause a flickering effect inside a building where sunlight passes through an opening such as a window or door.
- 5.10.4. For shadow flicker to occur, the receptor must be directly in line with the wind turbines when the sun is low in the sky and within 10 rotor diameters of a turbine where they are located within 130 degrees either side of north of any turbine. In these circumstances, the moving turbine blade briefly blocks / reduces the intensity of light entering an opening to a room on each rotation, causing a flickering to be perceived. In the open, shadow flicker is generally not perceived as light outdoors is reflected from all directions.
- 5.10.5. If, after design development, any properties were to be located within a 130 degree segment either side of due north, relative to the turbines and within ten rotor diameters of a turbine (as per guidance) they will be assessed for shadow flicker.
- 5.10.6. Where properties meet both of the criteria for there to be a potential shadow flicker effect, the seasonal duration of this effect will be calculated from the geometry of the turbine and the latitude of the Proposed Development site, to assess potential impacts upon the amenity of local residents. Mitigation measures will be proposed in the ES should they be necessary.

SOCIO-ECONOMICS

- 5.10.7. Wind farms have the potential to have both beneficial and negative effects on socio-economics, tourism and recreation.
- 5.10.8. In order to assess the potential socio-economic effects of the Proposed Development, it is necessary to gain a view as to the current position of the local economy. The character of the local economy will therefore be examined as part of the EIA to provide an overview of potential linkages with the Proposed Development. Tourist and recreation attractions along with any core paths or public rights of way (PRoW) within or surrounding the Site and identified within the LVIA will form part of the assessment (while direct effects on existing public access will be considered within the assessment, amenity effects for those using access routes will be considered within the LVIA). The site access will pass through common land, and therefore a secondary consent under Section 16 or 38 of the Commons Act 2006 will likely be required to accompany the DNS application.
- 5.10.9. The assessment will also examine the level of construction activity and job creation and the potential linkages with the wider local economy. This will include an assessment of potential multiplier effects within the local economy and the degree to which local businesses could benefit from the construction, operation and decommissioning of the Proposed Development. Potential community effects will also be examined and, whilst it is considered unlikely to be significant, the assessment will also qualitatively consider the potential for the Proposed Development to have an effect on other existing business activity.
- 5.10.10. There is no standard approach to this element within an EIA, however the general approach will be to outline the areas of the Proposed Development where there will be the potential for some economic/social effect within the wider area (including tourism, etc.). This will be undertaken with a view to examining the significance of these effects. Where possible (i.e., with quantifiable effects),

the significance will be assessed by way of comparison of the factor (e.g., construction jobs) with the variance of related factors within the local economy. Where effects cannot be quantified, the assessment of significance will be undertaken using professional judgement and experience.

POPULATION AND HUMAN HEALTH

- 5.10.11. The potential effects on population and human health arising from the Proposed Development would be considered in the context of the other factors identified in Schedule 4(2) of the 2017 EIA Regulations given that any environmentally related health issues (both beneficial and adverse) are likely to result from, for example, exposure to traffic, changes in living conditions resulting from noise, and increased employment opportunities. It is therefore proposed that population and human health effects of the Proposed Development are incorporated within the relevant technical chapters such as socio-economics, traffic and transport, noise, shadow flicker and landscape & visual (in respect of residential amenity in particular).
- 5.10.12. However, to clearly demonstrate that population and human health effects are included in the ES, and to assist with ease of reference, it is proposed that a summary table that identifies the potential effects and the ES chapter that considers the matter in more detail will be included.

CLIMATE

- 5.10.13. The resilience of the Proposed Development to climate change and extreme climate events will be considered within the detailed design and it is not proposed that a separate ES assessment is prepared. The projected impacts of climate change on the Proposed Development will also be considered in relevant aspect chapters. They will be summarised within the ES under the sub-heading “Climate change resilience”.
- 5.10.14. Climate change specialists will work with the engineering design team to scope in or out potential climate change impacts based on climate projections, best practice and expert judgement. This will ensure that the design of the Proposed Development is in-line with local, regional and national policies regarding adaptation to climate change. The design of the Proposed Development will consider the UK Climate Projections 2018 (UKCP18) for a variety of environmental parameters (e.g., extreme rainfall, temperature, drought etc.) to ensure that appropriate mitigation measures are embedded within the design. The climatic conditions at the end of the design life of the Proposed Development will be considered. Any alterations to the design of the Proposed Development to take account of future climate conditions will be outlined in the Design and Access Statement.
- 5.10.15. A carbon balance calculation will be completed using the Scottish Government Carbon Calculator Tool⁷¹, in line with advice given by PEDW within Scoping Directions for other Welsh wind farms. This will be reported in a Carbon Balance appendix within the ES. The calculation will include a full lifecycle assessment to determine the carbon benefit of the Proposed Development compared to a reference energy mix within the context of carbon budgets for Wales and the UK. This will include consideration of greenhouse gas (GHG) emissions in the production, transportation, erection,

⁷¹ Scottish Environment Protection Agency (2020). Carbon Calculator Tool v1.6.1 [online]. Available at: <https://informatics.sepa.org.uk/CarbonCalculator/index.jsp>

operation and decommissioning phases of the Proposed Development, together with the loss of peat should such areas not be avoided. Given the inherent carbon benefit of wind farms, a standalone GHG ES chapter is not required.

SUSTAINABLE RESOURCE USE

- 5.10.16. Although wind turbine developments can encompass large areas of land, the actual built developments cover a relatively small area and, in most circumstances, farming and other land based activities can continue in and around the turbines. As a result of, the Proposed Development would only result in a small land take, which is unlikely to result in significant environmental effects in terms of land use.
- 5.10.17. In terms of soil, the design of tracks, turbine foundations, hardstanding etc. would minimise the amount of soil disturbance. Where soils and peat would be excavated, they would be stored on the development site in accordance with the CEMP, which would be produced prior to construction and then used in the restoration of the development site post construction to minimise the loss of soil resource.
- 5.10.18. With regards to water, the key environmental effects on this natural resource would be its use during the construction, operational and decommissioning phases, the potential increase in flood risk and the disturbance of surface and groundwater as a result of construction activities. With regards to construction works, the water resource would be managed in accordance with the CEMP.
- 5.10.19. The potential effects of the Proposed Development on biodiversity would be addressed within the Biodiversity and Ornithology assessments within the ES within which appropriate mitigation will be set out in order to minimise the potential damage to habitats and species during the construction, operation and decommissioning. Mitigation measures will also be detailed in a Habitat Management Plan, which it is expected would be required by planning condition, and also within the CEMP.
- 5.10.20. As a result, it is not proposed that sustainable resource use is considered as a discrete assessment in the ES for the Proposed Development.

MAJOR ACCIDENTS AND DISASTERS

- 5.10.21. Paragraph (8) of Schedule 4 of the EIA Regulations states that an ES should describe “the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned”.
- 5.10.22. The scope for the EIA to consider major accidents and disasters has been initially considered in **Table 5-41**. Major accidents or disasters have been scoped in where they represent a risk to the Proposed Development, either from the proposed location or from the project itself. A high risk is considered to be where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to the requirement for mitigation which is beyond the usual scope of construction or operational activities. Where an accident or disaster has been scoped in, the ES chapter(s) identified will consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of appropriate mitigation.

Table 5-41 - Major accidents and disasters

Major Accident or Disaster	Risk Due to Location	Risk Due to Project	Scoped In/Out Due to Risk	Rationale	Environmental Statement Chapter
Biological hazards: epidemics	Very low	Very low	Out	The probability of epidemics which would affect the construction or operation of the Proposed Development is considered to be very low.	N/A
Biological hazards: animal and insect infestation	Very low	Very low	Out	The probability of animal and insect infestations which would affect the construction or operation of the Proposed Development is considered to be very low.	N/A
Earthquakes	No	No	Out	Any earthquakes in the vicinity of the Proposed Development would be of a very small magnitude and the design of turbine foundations etc. is adequate to withstand such low magnitude events.	N/A
Tsunamis / tidal waves / storm surges	No	No	Out	The general location of the Proposed Development and its distance from the coast means there is no risk of these phenomena affecting the Proposed Development.	N/A
Volcanic eruptions	No	No	Out	There are no active volcanos in the vicinity of the Proposed Development.	N/A
Famine / food insecurity	Negligible	Very low	Out	The probability of famine / food insecurity which would affect the construction or operation of the Proposed Development is considered to be negligible.	N/A
Displaced populations	Negligible	Very low	Out	The probability of displaced populations affecting the construction or operation of the Proposed Development is considered to be negligible.	N/A
Landslide / subsidence	Low	Low	In	The site of the Proposed Development is located in an area of previous coal mining. An assessment of potential impacts upon the Proposed Development from this previous mining activity, for	Ground Conditions chapter

				example from subsidence movements will be undertaken.	
Severe weather: storms	Medium	No	Out	Turbines are equipped with lightning conductors and automatically shut down when wind speeds are at a level which could damage internal components.	N/A
Severe weather: droughts	Very Low	No	Out	The probability of severe drought occurring in the vicinity of the Proposed Development is considered to be very low. Furthermore, turbines would be unaffected by drought conditions.	N/A
Severe weather: extreme temperatures	Low	Very Low	In – severe cold weather could lead to ice build-up on blades	Ice build-up could lead to ice throw, or to blade damage and throw.	The Proposed Development chapter.
Floods	Low	Very Low	In – a high level flood risk assessment will be undertaken as part of the EIA	Damage to turbines or infrastructure from flooding or increase in flood risk elsewhere from development in flood zones.	Wind farm site selection and design and Water Environment chapters.
Terrorist incidents	No	No	Out	N/A	N/A
Cyber attacks	No	No	Out	N/A	N/A
Disruptive industrial action	No	No	Out	N/A	N/A
Public disorder	No	No	Out	N/A	N/A
Wildfires	No	No	Out	N/A	N/A
Severe space weather	No	No	Out	N/A	N/A
Poor air quality events	No	No	Out	N/A	N/A
Transport accidents	No	Yes	In – abnormal loads and increase	Abnormal loads or an increase in traffic could lead to an increased risk of accidents. Road network may	Wind farm site selection and design and Traffic and

			from traffic construction.	be unsuitable for such traffic, further increasing accident risk.	Transport chapters.
Industrial accidents	No	Yes	In – from construction and maintenance activities.	Manual labour, working at height and use of specialist plant all bring risk of industrial accidents. Relevant UK health and safety legislation will be adhered to; site construction management practices will include, but are not limited to, temporary diversions of public rights of way, relevant signage and fencing of potentially hazardous construction areas where appropriate.	Construction activities are covered by separate H&S legislation and guidelines. Wind farm site selection and design, Water Environment and Biodiversity chapters.
Urban fires	No	No	Out	The Proposed Development is not in close proximity to any urban areas.	

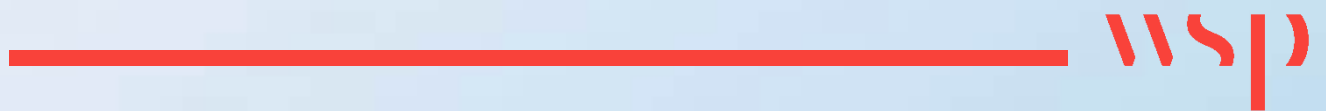
6 SUMMARY OF THE PROPOSED SCOPE OF THE EIA

SUMMARY

- 6.1.1. As set out in Section 5, the EIA for the Rhyswg Wind Farm will include detailed assessments on the following topics:
- Landscape and visual;
 - Historic environment;
 - Biodiversity;
 - Ornithology;
 - Water environment;
 - Ground conditions;
 - Traffic and transport;
 - Noise;
 - Shadow flicker;
 - Socio-economics; and
 - Aviation and telecommunications;
- 6.1.2. Additionally, the following topics will be considered as per approach in Section 5.10:
- Population and human health effects of the Proposed Development to be incorporated within relevant technical chapters;
 - The projected impacts of climate change on the Proposed Development will be considered in relevant aspect chapters. A carbon balance appendix will be included;
 - Sustainable resource use will be considered in individual topic chapters and will not be considered as a discrete assessment in the ES;
 - Major Accidents and disasters will be scoped in for consideration in individual topic chapters as (per Table 5-41).
- 6.1.3. The ES will consider the significant issues in more detail and will report on further investigations in relation to the above.
- 6.1.4. WSP and Pennant Walters Ltd. welcome comments on the proposed scope of the EIA and for any suggestions on potential mitigation and enhancement that can be incorporated into the Proposed development through the EIA process.

Appendix A

LVIA METHODOLOGY AND GLOSSARY



Appendix A

LVIA Methodology and Glossary

1.1 Introduction

- 1.1.1 The Landscape and Visual Impact Assessment (LVIA) and cumulative landscape and visual impact assessment (CLVIA) identifies, predicts, and evaluates the likely significant landscape and visual effects that may result from the Proposed Development.
- 1.1.2 Essentially, the landscape and visual effect (and whether it is significant) is assessed by considering the landscape or visual sensitivity to the Proposed Development, with reference to the susceptibility and value of the receptor, against the magnitude of change in order to identify a level of effect that would be brought about by the Proposed Development, were it to be implemented. The level of effect is also described in terms of its scale, geographical extent, and duration, and subsequently whether the effect would be significant.
- 1.1.3 The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and beneficial, neutral, or adverse. The assessment has also considered the cumulative effects resulting from the Proposed Development in combination with other existing and consented wind farms, and wind farms at the planning application or scoping stage.
- 1.1.4 The time period for the assessment covers phases of development related to the construction of the Proposed Development and associated infrastructure and its operational period.
- 1.1.5 Landscape and visual assessment unavoidably involve a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.
- 1.1.6 **Appendix 6A** has been structured as follows:
- General Methodology;
 - Landscape Assessment;
 - Visual Assessment;
 - Cumulative Landscape and Visual Assessment (CLVIA);
 - Evaluating Landscape and Visual Effects;
 - Residential Visual Amenity Assessment;
 - Production of ZTVs and Visualisations; and
 - Glossary of terms and abbreviations.

1.2 General Methodology

- 1.2.1 The methodology for the LVIA and CLVIA has been undertaken in accordance with best practice guidance including, but not limited to, the following:
- *Guidelines for Landscape and Visual Impact Assessment, 3rd Edition*¹ (hereafter referred to as *GLVIA3*);

¹ Landscape Institute and the Institute of Environmental Management and Assessment, (2013). Guidelines for Landscape and Visual Impact Assessment. 3rd edition. London. Routledge

- *Using LANDMAP in Landscape and Visual Impact Assessments GN46*²;
- *Visual Representation of Windfarms, Version 2.2*³;
- *Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*⁴;
- *Technical Guidance Note 06/19: Visual Representation of Development Proposals*⁵;
- *Technical Guidance Note 02/19: Residential Visual Amenity Assessment*⁶;
- *Wind Farm Design Guidance in Wales – Designing Wind Farms in Wales*⁷; and
- *Siting and Designing Windfarms in the Landscape, Version 3a*⁸.

1.2.2 The landscape and visual effects of wind turbines can be directly experienced through the observation of existing wind farms within this area. Noticeably, wind farm development can co-exist with other features of the landscape, rather than replacing or removing them, as in the case of more conventional built development, although they can alter the landscape character of an area. Wind farm development is also visually permeable and although views may be interrupted, they are not blocked or prevented. Generally, wind farms have a ‘small’ development footprint that preserves much of the physical elements of the landscape, but entails the addition of tall structures, which are unavoidably visible over longer distances, leading to greater visual effects. A further, important difference is the reversibility of almost all of the landscape and visual effects as a result of the decommissioning stage.

1.2.3 Wind farms give rise to a wide range of opinions, from strongly negative to strongly positive. However, LVIA is not an assessment of public opinion, although a precautionary approach has been taken, which assumes that the nature of the effects would be adverse unless otherwise stated.

Defining the LVIA Study Area

1.2.4 The LVIA study area will be agreed during the consultation process.

1.2.5 It is important to note that the boundary of the defined LVIA study area is not the limit of potential visibility.

² Natural Resources Wales. (2021). Using LANDMAP in Landscape and Visual Impact Assessments GN46. (Online). Available at: <https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/planning-and-development/evidence-to-inform-development-planning/using-landmap-in-landscape-and-visual-impact-assessments-gn46/?lang=en> (Accessed September 2023).

³ Scottish Natural Heritage (now NatureScot). (2017). Visual representation of wind farms: Guidance. Version 2.2. (Online). Available at: <https://www.nature.scot/visual-representation-wind-farms-guidance> (Accessed September 2023).

⁴ Scottish Natural Heritage (now NatureScot). (2012). Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments. (Online). Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-impact-onshore-wind-energy-developments#Introduction+and+scope+of+this+guidance> (Accessed September 2023).

⁵ Landscape Institute. (2019). Technical Guidance Note 06/19 Visual Representation of Development Proposals. London. (online). Available at: <https://www.landscapeinstitute.org/visualisation/> (Accessed September 2023).

⁶ Landscape Institute (2019). Technical Guidance Note 02/19: Residential Visual Amenity Assessment. (Online). Available at: <https://www.landscapeinstitute.org/technical-resource/rvaa/> (Accessed September 2023).

⁷ Design Commission for Wales. (2012). Designing Wind Farms in Wales. (online). Available at: <http://dcfw.org/designing-wind-farms-in-wales-2/> (Accessed September 2023).

⁸ Scottish Natural Heritage (now NatureScot). (2017). Siting and designing wind farms in the landscape - version 3a. (Online). Available at: <https://www.nature.scot/siting-and-designing-wind-farms-landscape-version-3a> (Accessed September 2023).

1.3 Landscape Assessment

1.3.1 Landscape effects are defined by the Landscape Institute in GLVIA3¹, paragraphs 5.1 and 5.2 as follows:

“An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern ... is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. ... The area of landscape that should be covered in assessing landscape effects should include the site itself and the full extent of the wider landscape around it which the development may influence in a significant manner.”

1.3.2 The potential landscape effects, occurring during the construction, operation and decommissioning period may therefore include, but are not restricted to the following:

- Changes to landscape elements: the addition of new elements (wind turbines, met mast(s) and ground level infrastructure elements) or the potential removal of existing elements such as trees, vegetation and buildings and other characteristic elements of the host LANDMAP aspect areas;
- Changes to landscape qualities: degradation or erosion of landscape elements and patterns and perceptual characteristics, particularly those that form key characteristic elements of host LANDMAP aspect areas or contribute to the landscape value of adjacent local landscape designations;
- Changes to landscape character: landscape character may be affected through the incremental effect on characteristic elements, landscape patterns and qualities (including perceptual characteristics) and the addition of new features, the magnitude of which is sufficient to alter the overall landscape character within LANDMAP aspect areas and/or landscape designations; and
- Cumulative landscape effects: where more than one wind farm may lead to a potential landscape effect.

1.3.3 Development may have a direct (physical) effect on the landscape as well as an indirect effect which would be perceived from the wider landscape, or other areas of landscape, outside the host LANDMAP aspect areas. This is usually, but not always exclusively, via a visual effect pathway.

Evaluating Landscape Sensitivity to Change

1.3.4 The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value. The overall sensitivity is described as High, Medium, Low or Very Low. Landscape sensitivity often varies in response to both the type of development proposed and the particular site location, such that landscape sensitivity needs to be considered on a case-by-case basis. This should not be confused with ‘inherent sensitivity’ where areas of the landscape may be referred to as inherently of ‘high’ or ‘low’ sensitivity. For example, a National Park may be described as inherently of high sensitivity on account of its designation, although it may prove to be less sensitive to particular development and/or of variable sensitivity across the geographical area of the National Park. Alternatively, an undesignated landscape may be of high sensitivity to a particular development regardless of the lack of local or national designation.

1.3.5 The main factors considered are discussed as follows:

Landscape Susceptibility

- 1.3.6 Landscape susceptibility according to GLVIA3¹ means “*the ability of the landscape to accommodate the development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*”. In the case of wind farm development there may be local or regional spatial strategies and/or landscape studies that can assist in broad scale judgements about the overall landscape capacity or sensitivity to wind farm development⁹. Attention, however, must be paid to the purpose, scope and methodology of these documents, as whilst providing assistance for strategic planning, they are not usually suitable for the assessment of specific wind farm proposals and should not be directly applied to individual applications. Rather, they provide broad information that should be considered as part of the more detailed landscape assessment.
- 1.3.7 Judgements on landscape susceptibility include references to both the physical and aesthetic landscape characteristics, and the potential scope for mitigation. Landscape susceptibility varies according to different areas of landscape character and whilst accepting that wind farm development is likely to lead to high levels of landscape change in most circumstances, factors that commonly indicate lower landscape susceptibility to wind farm development include landscape characteristics of larger scale, uniformity of land cover, simple landform and skylines with limited landscape features. Generally speaking, lower landscape susceptibility together with lower landscape value tends to indicate lower landscape sensitivity to development. Conversely, higher landscape susceptibility and value tend to indicate higher landscape sensitivity to development.
- 1.3.8 Common indicators of landscape susceptibility¹⁰ to wind farm development are as follows:
- **Landscape Scale:**
A large-scale landscape is generally considered to be less susceptible to wind farm development in comparison to a small-scale landscape.
 - **Landform and Topography:**
A simple landform with smooth, regular, rolling, undulating, or flowing landforms that might include plains, undulating or rolling lowlands, and plateaus that are generally considered to be less susceptible to wind farm development in comparison to more complex landforms which might include narrow glens, valleys, dramatic rugged and/or distinct landform features or pronounced undulations.
 - **Openness and Enclosure:**
Open landscapes are generally considered to be less susceptible to wind farm development, but could entail wider visibility, conversely enclosed landscapes could offer more screening potential, limiting visibility to a smaller area, but are also likely to be of smaller scale.
 - **Land Cover Pattern:**
Simple, regular landscapes with extensive areas of uniform ground cover (moorland / grassland, unenclosed land, forestry, large regular field patterns, parliamentary enclosures) are generally considered to be less susceptible to wind farm development in comparison to landscapes with more complex or irregular land cover (smaller fields,

⁹ A good example is *Heads of the Valleys Smaller Scale Wind Turbine Development Landscape and Sensitivity Study Final Report* (April 2015) prepared by Gillespies.

¹⁰ Scottish Natural Heritage (2015). A Guide to Commissioning a Landscape Capacity Study (Online) Available at: <https://www.nature.scot/sites/default/files/2019-10/A%20Guide%20to%20Commissioning%20a%20Landscape%20Capacity%20Study%20Toolkit.pdf> (Accessed April 2022).

medieval enclosures, smaller scale 'patchwork' landscapes of mixed fields with small woodland copses).

- Presence of Development:

Areas where there are existing large-scale developments including industry, mineral extraction, masts, pylons, other wind turbines (noting these turbines may be decommissioned in the lifetime of the Proposed Development), urban fringe / large settlement and major transport routes are generally considered to be less susceptible to wind farm development in comparison to areas characterised by smaller scale development (smaller, generally historic villages with dense settlement patterns and smaller scale associated buildings such as churches).

- Landmarks:

Landscapes that contain large scale landmarks which may include other wind farms (noting wind turbines may be decommissioned in the lifetime of the Proposed Development), and infrastructure and large-scale developments are generally less susceptible to wind farm development although development needs to be carefully sited to manage landscape foci and avoid 'visual clutter' or cumulative impacts. Historic landmarks such as important views to distinctive church spires and towers, particular 'landmark' landforms (prominent hills or peaks) or 'land art' generally increase susceptibility.

- Settlement:

Landscapes which are un-settled or with lower levels of population are generally considered to be less susceptible to wind farm development in comparison to more densely populated areas.

- Skyline:

Prominent and distinctive skylines, horizons (including indented ridges / peaks, key views and or vistas) or skylines with important landmark features that are identified in LANDMAP commentaries and responses, are generally considered to be more susceptible to wind farm development in comparison to broad, simple skylines which lack landmark features or contain other turbines / tall infrastructure features.

- Windiness and Rational:

Areas that appear to be windy / windswept which may also be elevated or exposed are generally considered to be less susceptible to wind farm development in comparison to more sheltered areas.

- Change and Movement:

Landscapes which contain movement (traffic, wind turbines, other moving infrastructure and waves / tides) or are subject to high levels of change (large scale forestry operations, mineral extraction, man-made change and development) are generally considered to be less susceptible to wind farm development in comparison to landscapes that are still or appear to be unchanging and/or notably historic with notable 'time depth'.

- Remoteness, Naturalness, Wildness / Tranquillity:

Notably wild or tranquil landscapes are generally considered to be more susceptible to wind farm development in comparison to cultivated or farmed / developed landscapes where perceptions of 'wildness' and tranquillity are less tangible. Landscapes which are either remote or natural may vary in their susceptibility to wind farm development.

- Landscape Context and Adjacent Landscapes:

The location and visual connection to adjacent landscapes may also have a bearing on the overall susceptibility of the landscape to wind farm development. This consideration is pertinent to the ridgeline and valley topography that characterises the parts of south Wales including the defined study area.

Landscape Value

- 1.3.9 This includes the consideration of a range of features which may include the presence or absence of landscape designation, special landscape qualities, rarity / representativeness, conservation interests, recreational value, perceptual qualities such as tranquillity and historical or cultural associations, as set out in GLVIA3¹, page 84, Box 5.1. The importance attached to a landscape, often as a basis for designation or recognition, which expresses national or local consensus, because of its quality including cultural associations, scenic or aesthetic qualities. Landscape value may be indicated by the presence or absence of a landscape planning designation such as an Area of Outstanding Natural Beauty (AONB) or Special Landscape Area (SLA) (higher value) indicating a landscape of national or local value accordingly or an undesignated landscape (lower value).
- 1.3.10 The absence of a landscape planning designation should not assume an area of 'low' landscape value and undesignated areas of landscape are often of some local value. Indications of this are likely to be present in the form of documented, locally valued, cultural / natural heritage and scenic or aesthetic qualities such as 'wildness' or the presence of viewing platforms or benches. The state of repair or condition of the elements of a particular landscape, its integrity and intactness and the extent to which its distinctive character is apparent are also relevant. The value of a landscape element may be influenced by the degree to which it may contribute to the overall landscape character type/area (i.e., its role), its rarity, and its condition. Landscapes of lower value tend to include those under intensive agriculture, forestry or urban fringe situations where the landscape elements and patterns have been eroded, landscapes with man-made development such as infrastructure or other wind farms (noting wind turbines may be decommissioned in the lifetime of the Proposed Development), and areas of derelict or vacant land, areas of mineral extraction and / or land fill.
- 1.3.11 Judgements on value and susceptibility are combined to determine overall landscape sensitivity which is informed by professional judgement and guided by the following matrix shown in **Table 1**. In terms of landscape value, statutory landscape designations are generally accorded the highest assessment value.

Table 1 Evaluation of Landscape Sensitivity

		<u>Susceptibility:</u>			
		High	Medium	Low	Very Low
<u>Value:</u>	High	High	High to Medium	Medium	Medium to Low
	Medium	High to Medium	Medium	Medium to Low	Low
	Low	Medium	Medium to Low	Low	Low to Very Low
	Very Low	Medium to Low	Low	Low to Very Low	Very Low

Evaluating the Magnitude of Landscape Change

1.3.12 The ‘magnitude’ or ‘degree of change’ resulting from a particular development is described as Very High, High, Medium, Low, Very Low or None. This is assessed by considering the scale, geographical extent and duration of the proposed change, which may include the loss or addition of particular features (primarily wind turbines), changes to landscape quality and changes to landscape character. As such this needs to be considered on a case-by-case basis. It may be possible for some mitigation measures to reduce the magnitude of change and consequently the residual landscape effects, and for these reasons the landscape design of the wind farm should form an iterative part of the assessment process. The main factors to be considered are discussed as follows.

- Loss, Alteration, or Addition to Landscape Elements:

Development may result in the loss, alteration, or addition of landscape elements such as trees, hedgerows, or development components such as wind turbines anemometry masts and new access tracks. These can be quantified objectively;

- Loss, Alteration, or Addition to Landscape Characteristics / Quality:

Development may result in the loss, alteration, or addition of physical landscape characteristics, such as wooded areas, landscape patterns, or development components such as wind turbines, which can be quantified objectively. Perceptual characteristics and effects on scenic quality or wildness also need to be considered, albeit subjectively, with reference made to objective and documented opinion; and

- Change to Landscape Character (As represented by LANDMAP Aspect Areas):

All landscapes change over time and much of that change is managed or planned. Often landscapes will have management objectives for ‘protection’ or ‘accommodation’, meaning that they may accommodate wind farm development and ‘change’ whereby the landscape character could be altered to create new landscapes for the accommodation of wind farm development and / or forestry or to provide areas or development resulting in townscape or peri-urban development. The scale of change may be localised, or occurring over parts of an area, or more widespread affecting whole landscape character areas and their overall integrity.

1.3.13 In addition to the scale or magnitude of the effect, GLVIA3¹ advises that consideration should also be given to the following aspects of a landscape effect:

Geographical Extent

- 1.3.14 Landscape effects should be described in terms of the geographical extent or physical area that would be affected (described as a linear or area measurement e.g. spatial extent of the hub height and/or blade tip ZTVs). This should not be confused with the scale of the proposed development or its physical footprint. Landscape effects occurring over a larger geographical extent and over a higher proportion of a landscape designation or LANDMAP aspect area are more likely to be regarded as significant.

Duration and Reversibility

- 1.3.15 Landscape effects should also be described in terms of the duration of the effect and whether this would be permanent, temporary or reversible. Duration can be considered as ranging between temporary (short to long term and time limited) or permanent. Although 'long term' some development such as housing should be regarded as permanent, whilst mineral extraction works usually entail several phases of development, followed by restoration to a 'new' landscape character. Wind farm development usually operates for a long term, time limited operational period, followed by a decommissioning period that would allow the landscape effects to be reversed. Reversibility is only assessed as part of the decommissioning stage and cannot factor into the assessment of the time limited operational effects.
- 1.3.16 Further guidance on the evaluation of landscape sensitivity and magnitude are provided in **Table 2**.
- 1.3.17 The level of landscape effect is evaluated through the combination of landscape sensitivity and magnitude of change, a process assisted by the matrix in **Table 5**, which is used to guide the assessment. In those instances where there would be no change to the landscape, the magnitude has been recorded as 'Zero' and the level of effect as 'None'.
- 1.3.18 Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' as required by the relevant EIA Regulations. Further information is also provided about the nature of the effects (whether these would be direct / indirect, temporary / permanent / reversible, cumulative, or beneficial, neutral, or adverse).
- 1.3.19 In describing the level of landscape effect, the assessment text clearly and transparently sets out the professional judgements that have been made in determining sensitivity and how the value and susceptibility of the landscape receptor has been assessed; and in determining magnitude and how the size and scale, geographical extent and duration of the effect has been considered.

Table 2 Landscape Sensitivity and Magnitude

Examples of Landscape Sensitivity	
High	Landscape character, characteristics, and elements with no or limited landscape capacity or scope for landscape change and higher landscape value and susceptibility to the proposed development. Often includes landscapes which are nationally, internationally or regionally designated and have a high landscape value. In relation to landscape designations, the documented Special Landscape Qualities ¹¹ are such that there would be no or limited landscape capacity or scope for landscape change of the type posed by the proposed development.

¹¹ As set out in a National Park Management Plan or the several Special Landscape Area reviews that have been commissioned by individual or consortia of local authorities in south Wales.

Medium	<p>Landscape character, characteristics, and elements with some landscape capacity or some scope for landscape change. Often includes landscapes of medium landscape value and quality as assessed in the relevant VSAA LANDMAP responses which may be locally designated or undesignated and have a medium landscape value.</p> <p>In relation to landscape designations, the documented Special Landscape Qualities are such that there would be some landscape capacity or scope for change or accommodation.</p>
Low	<p>Landscape character, characteristics and elements which display greater landscape capacity or scope for landscape change to accommodate the proposed development as part of spatial strategy for example. Usually applies to landscapes which are undesignated with indicators of lower landscape susceptibility to development. May also apply to landscapes that may have been subject to intensive agriculture, blanket forestry or other man-made development and have a low landscape value.</p>
Very Low	<p>Landscape character, characteristics and elements where there is a high landscape capacity or a planned desire for landscape change of the type proposed as part of spatial strategy for example. Usually applies to landscapes with a lower landscape susceptibility to development. May also apply to derelict landscapes, or vacant land, areas of mineral extraction and / or land fill for example.</p>

Examples of Landscape Magnitude

Very High	<p>Fundamental landscape change that would include the loss of several key landscape characteristics / special qualities or the addition of new highly uncharacteristic features or elements, that would become the dominant characteristics of the landscape, and change the overall landscape quality, and character over an expansive area.</p>
High	<p>A large-scale change and / or extent that may include the loss of key landscape characteristics / special qualities or the addition of uncharacteristic new features or elements, that would become prominent new characteristics of the landscape over a large area.</p>
Medium	<p>A medium-scale change of limited scale and extent including the loss of some key landscape characteristics / special qualities or elements, or the addition of some uncharacteristic new features or elements that would potentially change the landscape quality and character of a localised area or part of a landscape character type/area.</p>
Low	<p>A low-scale change affecting small areas of landscape character / special qualities, including the loss of lower value landscape elements, or the addition of new features or elements of limited characterising influence.</p>
Very Low	<p>A very low change affecting smaller areas of landscape character and quality, including the loss of some landscape elements or the addition of features or elements, which are either of low value or hardly noticeable in terms of their contribution to the landscape character.</p>
Zero	<p>There would be no change to the receptor.</p>

1.4 Visual Assessment

- 1.4.1 Visual Effects are concerned wholly with the effect of the development on views, and the general visual amenity and are defined by the Landscape Institute in GLVIA3¹, paragraphs 6.1 as follows:

“An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity. The concern ... is with assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the context and character of views.”

- 1.4.2 Visual effects are identified for different receptors (people) who will experience the view(s) at their places of residence, during recreational activities, at work, or when travelling through the area. The visual effects may include the following:
- Visual effect: a change to an existing static view, sequential views, or wider visual amenity as a result of development or the loss of particular landscape elements or features already present in the view(s); and
 - Cumulative visual effects: the cumulative or incremental visibility of similar types of development may combine to have a cumulative visual effect.
- 1.4.3 The level of visual effect (and whether this is significant) is determined through consideration of the ‘sensitivity’ of each visual receptor (or range of sensitivities for receptor groups) and the ‘magnitude of change’ that would be brought about by the construction and operation proposed development. Visual assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion is sought through consultation and internal peer review.

Zone of Theoretical Visibility (ZTV)

- 1.4.4 Plans mapping the Zone of Theoretical Visibility (ZTV) are used to analyse the extent of theoretical visibility of development or part of a development, across the defined and detailed LVIA Study Areas and to assist with viewpoint selection. For proposed wind farm developments ZTVs are calculated for the turbines’ hub heights and their blade tips. The ZTVs does not take account of the screening effects of buildings, localised landform and vegetation. As a result, there may be views experienced by residents in settlements and users of roads, footpaths, and other receptors within the LVIA study area which, although the receptors are indicated as falling within the ZTV, views in reality would be fully or partially screened or filtered by built form and vegetation.
- 1.4.5 The ZTVs provide a starting point in the assessment process and accordingly tend towards giving a ‘worst case’ or greatest calculation of the theoretical visibility.

Viewpoint Analysis

- 1.4.6 Viewpoint analysis is used to assist the assessment and is conducted from selected viewpoints identified and agreed upon with consultees within the LVIA Study Area. The purpose of this is to assess both the level of visual impact for particular receptors and to help guide the design process and focus the LVIA. A range of viewpoints are examined in detail and analysed to determine whether a significant visual effect would occur. By arranging the viewpoints in order of distance it is possible to define a threshold or outer geographical limit, beyond which there would be no further significant visual effects.
- 1.4.7 The turbines are always viewed as though facing towards the viewer to provide maximum potential visibility, although during operation, the turbines would face into the wind. The prevailing wind direction, likely to occur during the operational period is therefore also informative to the assessment, particularly if this tends to be variable or directional. In South Wales the prevailing wind direction is from the south-west.

Evaluating Visual Sensitivity to Change

- 1.4.8 In accordance with paragraphs 6.31-6.37 of GLVIA3¹ the sensitivity of visual receptors takes account of the susceptibility of the receptor to visual change and the value of the baseline view available to them. Sensitivity is assessed as High, Medium, Low, or Very Low, although in practice 'Very Low' sensitivity is not used.

Visual Assessment: Susceptibility

- 1.4.9 The main factors to consider are the activity or occupation of the receptor at the viewpoint or receptor location and the extent to which their attention or interest may be focused on the view and visual amenity of the surrounding landscape. Whilst it is accepted that people will undertake a range of different activities, their visual experience of a development will change according to where they are, and what they are doing, and susceptibility is assessed as follows:
- People at nationally recognised viewpoints, people at views/vistas attached to heritage features (such as Registered Parks and Gardens) or other locations recognised nationally in art or literature, are assessed as of high susceptibility. People in their communities including those engaged in outdoor recreation (e.g. users of public open spaces), where the focus of the activity is on enjoyment of the landscape and there is a high frequency of use, are also considered to be of high susceptibility;
 - People on local footpaths routed through undesignated landscapes that may be of lower scenic quality, and people engaged in sport, or travelling / commuting, especially on motorways, trunk roads and other 'A' roads are considered as to be of less susceptibility (medium); and
 - People at their place of work where views are not an important contributor to the quality of working life possess the least (low) susceptibility.

Visual Assessment: Value

- 1.4.10 In relation to value, consideration is given to the value of the view(s) through reference to local or national scenic landscape designation. Other factors to consider include the importance or popularity of the view(s) and/or the likely numbers of viewers and the location and context of the viewpoint. The visual experience from a tourist destination, for example, could involve either the key views to, or from the main attraction, or those from the car-park / service area, and this context will affect the sensitivity and value of the views. Whilst views from car-parks / service areas may still be experienced by receptors of inherently higher sensitivity; these types of views should not be considered of higher value or sensitivity.
- 1.4.11 Landmarks / tourist attractions and national trails visited and used by large numbers of people are likely to be of higher value and more sensitive than those which are less visited. Occasionally there may be exceptions such as motorways where, although there are higher numbers of receptors these are generally considered to be of lower value. Conversely some less well visited footpaths within remote areas, may be of higher value precisely because of the lower visitor numbers.
- 1.4.12 Judgements on value and susceptibility are combined to determine overall visual sensitivity which is informed by professional judgement and guided by the following matrix shown in **Table 3**.

Table 3 Evaluation of Visual Sensitivity

		<u>Susceptibility:</u>		
		High	Medium	Low
<u>Value:</u>	High	High	High to Medium	Medium
	Medium	High to Medium	Medium	Medium to Low
	Low	Medium	Medium to Low	Low

Evaluating the Magnitude of Change to the View

1.4.13 The magnitude of change is described as Very High, High, Medium, Low, Very Low or Zero, and is assessed by consideration of possible changes caused by the Proposed Development, which may affect the view. For visual receptors for whom the Proposed Development would not be visible and there would be no change to their view, the magnitude has been recorded as ‘zero’ and the level of effect as ‘no view’.

1.4.14 The magnitude of visual change is described by reference to the following:

- Scale of Change:

The scale of change in the view (including horizontal and vertical FoV¹² affected), is determined by the loss or addition of features in the view and changes in the composition and extent of view affected. This can in part be described objectively by reference to numbers of new objects visible and the horizontal / vertical extents of the FoV affected.

- Contrast:

The degree of contrast or integration of any new features or changes in the landscape with the existing or remaining landscape elements and characteristics in terms of mass, scale, colour, movement, form and texture. Proposed Developments which contrast or appear incongruous in terms of colour, scale and form are likely to be more visible and to generate a higher magnitude of change.

- Distance:

The proximity or distance from the Proposed Development can be described objectively and often provides a strong indicator of magnitude, subject to any intervening screening by landform, vegetation, or buildings.

- Speed of Travel:

The speed at which the Proposed Development may be viewed will affect how long the view is experienced and the likelihood of the Proposed Development being particularly noticed by people travelling in cars compared to those who may be walking and able to stop and ‘take in’ a view.

- Angle of View (AoV):

The AoV from the main viewing direction may be considered in terms of whether the Proposed Development is experienced directly or at an oblique angle from the visual receptors’ main viewing direction. Road users are generally more aware of the views in the direction of travel, whilst train passengers are more aware of views perpendicular to

¹² Field of View.

their direction of travel. Elevated views are likely to reveal more of the Proposed Development, whereas low level views are more likely to be screened by intervening built form and vegetation.

- Screening:

The Proposed Development may be wholly or partly screened by landform, vegetation (seasonal) and or built form. Conversely open views, particularly from landscapes where LANDMAP identifies their availability as a characteristic, are likely to reveal more of a development.

- Skyline / Background:

Whether the Proposed Development would be viewed against the skyline or a background landscape may affect the level of contrast and magnitude, for example, skyline developments may appear more noticeable, particularly where they affect open and uninterrupted horizons. Conversely, wind turbines may also appear more noticeable when viewed against a darker background landscape, such as forestry.

- Nature of Visibility:

The nature of visibility, whether this is subject to various phases of development change and the manner in which the development may be viewed such as intermittently or continuously, and / or seasonally, due to periodic management or leaf fall, is a further factor for consideration.

- 1.4.15 In addition to the scale or magnitude of the effect, GLVIA3¹ advises that consideration should also be given to the following aspects of a visual effect:

Geographical Extent

- 1.4.16 A visual effect is also considered in terms of the geographical extent, physical area or location over which it would be experienced (described as a linear or area measurement). Visual effects affecting a large geographical area are more likely to be regarded as significant.

Duration and Reversibility

- 1.4.17 A visual effect is also considered in terms of the duration over which the effect would be experienced and whether this would be permanent, temporary or reversible. Duration can be considered as ranging between temporary (short to long term and time limited) or permanent. Although 'long term' some development such as housing should be regarded as permanent, whilst mineral extraction works usually entail several phases of development, followed by restoration. Wind farm development usually operates for a long term, time limited period, followed by a decommissioning period that would allow the visual effects to be reversed. Reversibility is only assessed as part of the decommissioning stage and cannot factor into the assessment of the time limited operational effects. Permanent visual effects (not time limited) are more likely to be regarded as significant.
- 1.4.18 Further guidance on the evaluation of visual sensitivity and magnitude is provided in **Table 4**.

Table 4 Visual Receptor Sensitivity and Magnitude

Examples of Visual Sensitivity	
High	People in their communities and on long distance, strategic footpaths or popular footpaths and tourist destinations, viewing important landscape features, beauty spots and picnic areas, where the activities are focused on the landscape. Receptors include groups of high susceptibility to change such as residents, tourists / visitors, and walkers travelling through the landscape, viewing and experiencing landscapes of high value and quality.
Medium	People within outdoor sports based recreational spaces such as golf courses, using local or less well used recreational routes of viewing landscapes of high or medium value. Receptors include groups of medium susceptibility to change receptors such as some walkers, cyclists, road users, and other recreational receptors travelling through the landscape / seascape. Viewing and experiencing landscapes of medium value and quality.
Low	People working on the land or sea, at their place of work, or taking part in activities such as team sports that do not involving an appreciation of the landscape, including vehicular receptors travelling on motorways and other busy trunk and 'A' roads. Often viewing and experiencing landscapes of medium to low value and quality.
Very Low	Not used.
Examples of Visual Magnitude	
Very High	A major change and/or obstruction of a view that is directly visible, appearing as the dominant and contrasting feature appearing in the fore ground and potentially the middle ground of the view.
High	A substantial change that may be directly visible, appearing as a highly prominent and contrasting feature appearing in the fore or middle ground.
Medium	A prominent change or partial view of a new element within the view that may be readily noticeable, directly or obliquely visible including glimpsed, partly screened or intermittent views, appearing as a prominent feature in the middle ground or background landscape.
Low	A noticeable or small level of change, affecting a small part of the view that may be obliquely viewed or partly screened and/or appearing in the background landscape although noticeable. May include views experienced whilst travelling at speed.
Very Low	A small or intermittent change to the view that may be obliquely viewed and mostly screened and/or appearing in the distant background or viewed at high speed over short periods and capable of being missed by the casual observer.
No View	There would be no change to the view.
1.4.19	The level of visual effect is evaluated through the combination of visual sensitivity and magnitude of change, a process assisted by the matrix in Table 5 , which is used to guide the assessment. In those instances where there would be no change or no visibility or view of the Proposed Development, the magnitude has been recorded as 'Zero' and the level of effect as 'No View'.
1.4.20	Once the level of effect has been assessed, a judgement is then made as to whether the level of effect is 'significant' as required by the relevant EIA Regulations and is set out at Section 1.6 of this Appendix. Further information is also provided about the nature of the

effects (whether these would be direct / indirect, temporary / permanent / reversible, cumulative, or beneficial, neutral or adverse).

1.5 Cumulative Landscape and Visual Assessment

- 1.5.1 The assessment of cumulative effects is essentially the same as for the assessment of the primary landscape and visual effects, in that the level of landscape and visual effect is determined by assessing the sensitivity of the landscape or visual receptor and the magnitude of change. The cumulative assessment, however, considers the magnitude of change posed by multiple developments.
- 1.5.2 A cumulative landscape or visual effect simply means that more than one type of development is present or visible within the landscape. Other forms of existing development and land-use such as woodland and forestry, patterns of agriculture, built form, and settlements already have a cumulative effect on the existing landscape that is already accepted or taken for granted. These features often contribute strongly to the existing character, forming a positive or adverse component of the local landscape. Landscapes however, will have a finite capacity for cumulative development, beyond which further new development would result in landscape character change and could result in the creation of a 'wind farm landscape' where wind farms have become the dominant characteristic.
- 1.5.3 Detailed guidance on the cumulative assessment of wind farm development is provided in the SNH document '*Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments*' (2012). This assessment distinguishes between 'additional' cumulative effects that would result from adding the Proposed Development to other cumulative wind farm development and 'combined' cumulative effects that assess the total cumulative effect of the Proposed Development and other cumulative wind farm development. In the latter case a significant cumulative effect may result from the Proposed Development or one of more other existing, under-construction or consented wind farms, or other wind farm applications. In those cases, the main contributing wind farm(s) is identified in the assessment.
- 1.5.4 Types of cumulative effect are defined as follows:
- Cumulative Landscape Effects: Where more than one wind development may have an effect on a landscape designation or particular area of landscape character as defined by LANDMAP Aspect Areas;
 - Cumulative Visual Effects: the cumulative or incremental visibility of similar types of development that may combine to have a cumulative visual effect. These can be further defined as follows:
 - ▶ Simultaneous or combined: where two or more developments may be viewed from a single fixed viewpoint simultaneously, within the viewer's field of view and without requiring them to turn their head¹³;
 - ▶ Successive or repetitive: where two or more developments may be viewed from a single viewpoint successively as the viewer turns their head or swivels through 360°; and
 - ▶ Sequential: where a number of developments may be viewed sequentially or repeatedly at increased frequency, from a range of locations when travelling along road, Sustrans national or regional cycle route or promoted long distance route within the LVIA Study Area.

¹³ Note: A person's field of view is variable but is approximately 90° when facing in one direction.

- 1.5.5 The SNH document ‘*Siting and Designing Wind farms in the Landscape*’ (Version 3a) explains that the development of multiple wind farms within a particular area may create different types of cumulative effect, such as where:
- “The wind farms are seen as separate isolated features within the landscape character type, too infrequent and of insufficient significance to be perceived as a characteristic of the area;*
- The wind farms are seen as a key characteristic of the landscape, but not of sufficient dominance to be a defining characteristic of the area; [a landscape with wind farms] and*
- The wind farms appear as a dominant characteristic of the area, seeming to define the character type as a ‘wind farm landscape character type.’”*
- 1.5.6 Wind farm development that results in the creation of a ‘*wind farm landscape*’ as opposed to a ‘*landscape with wind farms*’ or ‘*landscape with occasional wind farms*’ is likely to be assessed as significant. Equally the ‘additional effect’ of a proposed wind farm development, adding to a scenario where there are already a number of other existing or consented wind farms, may be less than the effect of the Proposed Development either on or primary basis or in an area where there are few or no wind farms existing. This is because wind farm development has already been established as a characterising influence and the additional effect of further development may or may not alter this.
- 1.5.7 Whilst the CLVIA considers other wind farm development, it should not be considered as a substitute for individual LVIA assessment in respect of each of the other cumulative developments included in the CLVIA.

Defining the Cumulative Study Area

- 1.5.8 The cumulative study area will be confirmed during the consultation process. Other existing, consented, planning application and scoping wind energy sites included within this study area are noted and considered in terms of their likely relevance to the CLVIA.
- 1.5.9 Sites within the Cumulative Search Area which are considered likely to contribute to a significant cumulative effect in ‘addition’ or in ‘combination’ with the Proposed Development are included in the CLVIA.

Predicting Cumulative Landscape Effects

- 1.5.10 The CLVIA considers the extent to which the Proposed Development, in combination with other existing, consented or proposed wind farm may change landscape character through either an ‘additional’ or ‘in combination’ effect on characteristic elements, landscape characteristics and quality of the baseline landscape character as defined in LANDMAP. Identified cumulative landscape effects are described in relation to each individual scoped in LANDMAP Aspect Area and for any scoped in designated landscape areas assessed within the LVIA Study Area.

Predicting Cumulative Visual Effects

- 1.5.11 The assessment of cumulative visual effects involves reference to the cumulative visibility ZTV maps and the cumulative viewpoint analysis. The cumulative visibility of other existing and consented wind energy developments and applications is established in the first instance using the computer programme (Resoft Wind Farm© software) to identify areas where wind energy developments are theoretically visible. Cumulative visibility maps are analysed to identify the visual receptor locations and routes where cumulative

visual effects on the landscape and people may occur as a result of the Proposed Development.

- 1.5.12 With potential receptor locations identified, cumulative effects on individual receptor groups are then explored through viewpoint analysis, which involves site visits informed by wireline illustrations that include other wind energy developments. The computer programme itself can also be used to ‘drive’ particular routes to assess the visibility of different wind energy developments and inform the assessment of sequential cumulative effects that may occur along a route or journey, and compared to actual visibility experienced along a route during the site visit.

Evaluation of Cumulative Landscape and Visual Effects

- 1.5.13 The evaluation of cumulative effects is assisted by the matrix in **Table 5**, which is used to guide the assessment.
- 1.5.14 The cumulative assessment has been prepared to ensure that, as well as the primary effect of the Proposed Development (LVIA) the ‘additional’ cumulative effects and the ‘combined’ cumulative effect (CLVIA) is also reported to account for two cumulative Scenarios as follows:
- Existing + Proposed Development:
 - ▶ The primary effect in the context of the current baseline of operational wind energy developments.
 - Scenario 1: Existing + Consented + the Proposed Development:
 - ▶ The additional and combined cumulative effects of any consented wind energy developments with the Proposed Development are assessed.
 - Scenario 2: Existing + Consented + Applications + the Proposed Development:
 - ▶ The additional and combined cumulative effects of the existing and consented wind energy developments and any live applications (which would include schemes at scoping), with the Proposed Development are assessed.
- 1.5.15 Due to the numbers of other wind energy developments scoped into the CLVIA, the overall cumulative effects may be greater than for the primary effect or additional effect for the Proposed Development assessed in the main LVIA. The resulting level of cumulative effect may remain at the same level of effect or increase to a higher level of effect. The point at which these effects become significant or not significant in landscape and visual terms is still a matter for professional judgement, although four scenarios or combinations of cumulative effect, taking account of other wind energy development can occur as follows:
- A significant effect from the Proposed Development is predicted in addition or combination with another significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is a greater level of effect than assessed for either development individually;
 - A significant effect from the Proposed Development is predicted in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed significant and cumulative, but is attributed to the Proposed Development and is a greater level of effect than for either development assessed individually;
 - A non-significant effect from the Proposed Development is predicted in addition or combination with another significant effect attributed to other wind energy

development(s). The effect is still termed significant and cumulative, but is attributed to the other wind energy development(s) and is a greater level of effect than for either development individually; and

- A non-significant effect from the Proposed Development is assessed in addition or combination with another non-significant effect attributed to other development(s). The effect is still termed cumulative and is a greater level of effect than for either development individually; the combined effect however, may be assessed as either significant or not significant.

1.5.16 The nature of a cumulative effect may also be described as direct / indirect, temporary / permanent, or beneficial / adverse. The probability of a cumulative effect occurring may also be described (certain, likely or uncertain / unknown).

1.6 Evaluating Landscape and Visual Effects

1.6.1 The level of effect relating to landscape and visual effects and / or cumulative landscape and visual effects is determined by the combination of sensitivity (ranging from High to Very Low) and magnitude of change (ranging from Very High to Zero), which is assisted by the matrix illustrated in **Table 5**. In addition to the scale or magnitude of the effect, the GLVIA3¹ advises that consideration should also be given to the geographical extent and duration or reversibility of the effect as described earlier.

Types of Landscape and Visual Effect

1.6.2 The relevant EIA Regulations also require that the level of effect is described in terms of its 'type' or 'nature' of effect (whether the effect is permanent / temporary, direct / indirect, beneficial/neutral/adverse and or cumulative) as well as the scale over which the effect would occur. For example, an effect may be locally significant, or significant with respect to a small number of receptors, but not significant when judged in a wider context. These terms are defined below:

- Temporary or Short Term / Long term / Permanent:

The time period over which an effect may occur is referred to as temporary / short term, long term, or permanent. Wind farm development is considered 'in perpetuity' due to the long-term periods of operation. However, the Proposed Development is time-limited and the effects would also be reversible upon completion of the Proposed Development's decommissioning.

- Direct / Indirect effects:

Direct effects relate to the host landscape elements and LANDMAP Aspect Areas and concern both physical and perceptual effects on these receptors. Indirect effects relate to those LANDMAP Aspect Areas, designated landscapes and visual receptors which separated by distance or remote from the Proposed Development. Such receptors can only be impacted via of visual or perceptual effects pathways. The Landscape Institute also defines indirect effects as those which are not a direct result of the Proposed Development but are often produced elsewhere or from a complex pathway e.g. localised road widening to facilitate delivery of turbines along the proscribed access route.

- Beneficial / Neutral / Adverse:

The landscape and visual effects generated may be beneficial, neutral, or adverse. The LVIA assumes that the nature of the effects would be 'adverse' unless otherwise stated i.e. adopts a worst-case scenario and in the case of wind farm development, the most

noticeable effects and changes are likely to be visual. However, GLVIA3¹ cautions against the automatic assumption that all change would result in an adverse effect.

- ▶ In Landscape Terms: a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include changes that neither add nor detract from the quality and character of an area including development that may be reasonably accommodated within the scale and capacity of the landscape in the context of landscape management and change as defined in LANDMAP commentaries, and very low magnitudes of change. An adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction or operation that exceeds landscape capacity, leading to a reduction in landscape quality and character of a LANDMAP Aspect Area or a landscape designation;
- ▶ In Visual Terms: beneficial or adverse effects are less easy to define or quantify and require subjective consideration of a number of aesthetic factors affecting the view, which may be beneficial, neutral, or adverse. Not all change, including high levels of change, is necessarily an adverse experience. Public opinions as to the visual effects of wind farms vary widely, however this LVIA is not an assessment of public opinion. Rather, an LVIA considers architectural and aesthetic factors such as the visual composition of the landscape in the view together with the wind farm design, which may or may not be reasonably accommodated within the scale and character of the landscape as perceived from the receptors' location. Neutral visual effects would include changes that are not dominating, overbearing, or oppressive. They include development that appears reasonably well accommodated within the scale and landscape setting or context and also includes very low magnitudes of change. An adverse effect may include poor visual design quality such as overlapping ('stacking') turbines, inappropriate scale of development relative to the underlying landscape, or other visual factors that may reduce scenic quality, such that the wind farm would appear dominating, overbearing, or oppressive.

Probability of Cumulative Effect

- 1.6.3 The probability of cumulative effects is variable. Those effects related to existing wind energy development and those under construction are considered as certain; effects related to development with planning consent are considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain.

Determining the Significance of Effects

- 1.6.4 In accordance with the relevant EIA Regulations it is important to determine whether the effects, assessed as a result of the Proposed Development, are likely to be significant. Significant landscape and visual effects will be highlighted in **bold** in the text and in most cases, relate to all those effects that result in a '**Major**' or '**Major/Moderate**' effect as indicated in **Table 5**.
- 1.6.5 In some circumstances, '**Moderate**' levels of effect also have the potential, subject to the assessor's opinion, to be considered as significant and these exceptions are also highlighted in bold and explained as part of the assessment, where they occur.
- 1.6.6 Wind turbines are tall, visible structures and the existence of what would inevitably be a significant effect does not mean that the proposal should be considered 'unacceptable' and consent refused.

1.6.7 In accordance with the overall significance matrix used for the EIA, some moderate, moderate/minor, minor and negligible effects, are determined as ‘not significant’. In those instances where there would be no effect, the magnitude has been recorded as ‘Zero’ and the level of effect as ‘None’.

Table 5 Evaluation of Landscape and Visual Effects

		Landscape and Visual Sensitivity			
		High	Medium	Low	Very Low
Magnitude of Change	Very High	Major (Significant)	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)
	High	Major (Significant)	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Medium	Major/Moderate (Significant)	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)
	Zero	None / No View			

1.6.8 In line with the emphasis placed in GLVIA3¹ upon application of professional judgement, the adoption of an overly mechanistic approach through reliance upon a matrix as presented in **Table 5** will be avoided. This will be achieved by the provision of clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape and visual receptor over and above the outline assessment provided by use of the matrix. Matrices for landscape and visual effects are provided as a summary in support of the narrative explanations. Wherever possible cross references will be made to baseline figures and/or to photomontage visualisations to support the rationale.

1.7 Residential Visual Amenity Assessment

1.7.1 The assessment of Residential amenity is a planning matter that involves consideration of a number of effects (such as noise and shadow flicker), of which residential visual amenity is a single component. The RVAA is limited to the consideration of visual effects on the residential amenity of residential properties. Visual amenity is defined in GLVIA3¹ as:

‘the overall pleasantness of the views they enjoy of their surroundings’

1.7.2 Residential Visual Amenity means: *‘the overall quality, experience and nature of views and outlook available to occupants of residential properties, including views from gardens and domestic curtilage. Residential Visual Amenity is one component of ‘Residential Amenity’⁶.*

- 1.7.3 The RVAA for the proposed development is set out in this appendix and should be read in conjunction with the LVIA chapter of the EIA Report.
- 1.7.4 Planning law contains a widely understood principle that the outlook or view from a private property is a private interest and not therefore protected by either the Scottish or UK planning system. However, the planning system also recognises situations where the effects on residential visual amenity are so serious as to become a matter of public interest. This matter has been examined at a number of public inquiries in the Scotland and the rest of the UK where the key determining issue was not the identification of significant effects on views, but whether the Proposed Development would have an effect on the residential visual amenity through an ‘overbearing’ and / or ‘dominating’ effect resulting in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. The effects on residential amenity are subsequently considered as part of the planning balance as part of the consent process.
- 1.7.5 Consequently, the RVAA methodology provides for a much more detailed assessment of the closest residential properties to the Proposed Development. This allows the assessor and consequently the determining authority to make a judgement as to whether the residents at these residential properties would be likely to sustain unsatisfactory living conditions which it would not be in the public interest to create. Reviews of decisions demonstrate that significant visual effects or changes to the views available from a residential property and its curtilage are not the decisive consideration, rather it is the residential amenity and, in this case, residential visual amenity that is determinate.
- 1.7.6 The methodology for RVAA accords with the advice in GLVIA3¹, and the Landscape Institute’s Residential Visual Amenity Assessment Technical Note 2/19⁶. It involves a four-step process as follows:
- *“1: Definition of the study area and scope of the assessment.*
 - *2: Evaluation of baseline visual amenity at properties to be included having regard to the landscape and visual context and the development proposed.*
 - *3: Assessment of likely change to visual amenity of included properties in accordance with GLVIA3 principles and processes.*
 - *4: Further assessment of predicted change to visual amenity of properties to be included forming a judgement with respect to the Residential Visual Amenity Threshold.”⁶*
- 1.7.7 Other factors affecting residential amenity such as noise and shadow flicker are not considered as part of this assessment but will be addressed by other chapters of the EIA Report.

Step 1: Scope of Assessment

- 1.7.8 Based on the Landscape Institute’s guidance, a study area of 2km distance from the proposed turbines has been selected for the RVAA. This study area is then reviewed against the site-specific conditions of the proposed development and the ZTV which may indicate a slightly smaller or larger study area is required.
- 1.7.9 A residential property, for the purposes of environmental impact assessment, should be one that was designed and built/converted for that purpose and currently (at the time of the assessment) remains in a habitable condition (is of a safe construction, wind and watertight with appropriate vehicle access, and services such as drinking water, sanitation, and power supply). Other buildings such as barns/ outbuildings, garages,

sheds and derelict properties should generally be excluded from the assessment, unless they form part of the curtilage of an existing residence.

- 1.7.10 The assessment of residential properties or clusters of residential properties has been limited to those which appear on the Ordnance Survey 1:25,000 scale map and are overlapped by the blade tip ZTV. The assessment has been informed by site visits, observing the properties from public locations and through the examination of publicly available aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines. Some of the properties are accessed via private or gated roads and due to these access limitations, they have been assessed from the nearest public road or footpath which may be at greater distance from the property. As such the assessment represents an informed judgement of the likely visual effects and the consequential effects on residential visual amenity.
- 1.7.11 Planning permissions for new residential properties and conversions which have not been built at the time of the assessment have not been included.

Step 2: Site Survey and Baseline Reporting

- 1.7.12 The assessment has been informed by site visits, observing the properties from public locations and through the examination of publicly available aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines. As such the assessment represents an informed judgement of the likely visual effects and the consequential effects on residential visual amenity.
- 1.7.13 Each property including in the RVAA has been described in terms of the type, nature, extent and quality of the views that may be experienced 'in the round' from the dwelling itself and the domestic curtilage which includes the main living areas, usually the ground floor and the main garden and immediate driveway. The relationship of the property with the surrounding landscape and a description of the views in terms of whether they may be considered as primary, secondary or peripheral views.
- 1.7.14 The assessment allows for the screening effects of vegetation with the following caveats:
- Forestry screening is subject to forestry management and the assessment allows for either no forestry screening or maximum forestry screening, representing the two extremes likely to affect the view during the operational period of the Proposed Development.
 - Woodland and hedgerow screening – Where this includes mature, long standing mixed or broadleaved woodland a degree of permanence has been assumed in the assessment.
 - Individual trees – Where these are mature a degree of permanence has been assumed in the assessment. However, this is subject to the long-term retention of individual trees that would need to be assessed on a case-by-case basis, which is beyond the scope of this assessment.
 - Garden vegetation has been assumed to have a degree of permanence. In the event that it is removed and replanted, most garden shrubs / hedges are reasonably quick to re-establish or are replaced on a piecemeal basis.
- 1.7.15 The assessment takes account of the likely views from the ground floors of properties and main garden areas but excludes upper floors and other land that may relate to the property and is not part of the main living areas.

Cumulative wind farm development

- 1.7.16 The assessment also takes account of cumulative effects likely to result from the visibility of other wind energy development. In order to identify the likely significant effects, and noting that the RVAA study area is 2km, the baseline of other wind energy development considered in this assessment has been limited to those wind farms within 10km of the proposed development.

Step 3: Visual Assessment

- 1.7.17 A visual assessment is undertaken to identify those properties where a significant visual effect on a view from the property is likely to occur. The methodology for this is set out previously under visual assessment and combines an assessment of 'sensitivity' with an assessment of 'magnitude'.
- 1.7.18 The sensitivity of individual residential receptors has been assessed as 'High' in each case due to the high susceptibility of residents in accordance with GLVIA3¹, paragraph 6.33. The value of the view is also likely to be regarded as high by the residents themselves, but the views in this area are not nationally or locally designated for their scenic value and accord a medium value in this respect.
- 1.7.19 The assessment is supported by aerial and ground level photography as well as map-based data, the production of ZTV plots and visualisations such as wirelines and photographs where appropriate, which are illustrated for each property.

Step 4: Residential Visual Amenity Assessment

- 1.7.20 The second stage is to consider the residential visual amenity and whether, in terms of the wider public interest, the visual effects would result in unsatisfactory living conditions, leading to a property being regarded, objectively, as an unattractive (as opposed to a less attractive) place in which to live. Relevant information considered as part of the assessment may include, but is not limited to the following:
- Scale of Wind Farm:
 - Number and height of visible turbines;
 - The horizontal extent or Angle of View (AOV) of the visible turbine array; and
 - Separation distance (closest and furthest visible turbines).
 - Description of Property, as far as this can be ascertained:
 - Orientation and size of property and whether views from the property towards the wind farm would be direct or oblique;
 - Location of principal rooms and main living areas such as living/dining rooms, kitchens and conservatories, as opposed to upstairs rooms (bedrooms / bathrooms), working areas such as farm buildings and utility areas;
 - Location of principal garden areas which may include patios and seating areas as opposed to less well used areas such as paddocks or garages; and
 - The effects of any screening by landform, vegetation or nearby built development.
 - Location and Context:
 - The aspect of the property in terms of the overall use and relationship to the garden areas and surrounding landscape;

- The principal direction of main views and visual amenity;
- The context and nature of any intervening structures e.g. other existing wind farm development, farm buildings or forestry.

- 1.7.21 A final assessment is then made to determine if, in the assessor's opinion, the residential visual amenity threshold would be breached by the proposed development and as such should be considered further as part of the planning balance.
- 1.7.22 The RVAA is reported in **Appendix 6J**.

1.8 Production of ZTVs and Visualisations

- 1.8.1 Zones of Theoretical Visibility (ZTVs) and visualisations (wirelines / wirelines and photomontages) are graphical images produced to assist and illustrate the LVIA and the cumulative assessment. The methodology accords with the SNH guidance Visual Representation of Wind Farms, Version 2.2³. Further, additional guidance is provided by the Landscape Institute Technical Guidance Note: Visual Representation of Development Proposals⁵.

Methodology for Production of ZTVs

- 1.8.2 The ZTVs are calculated using ArcGIS software to generate the zone of theoretical visibility of the Proposed Development. This software creates a 3D computer model of the existing landscape and the development using Ordnance Survey Terrain 5. This data provides a digital record of the existing landform of Great Britain based on 5m grid squares and models representing the specified geometry and position of the proposed turbines. The computer model includes the defined and detailed LVIA Study Area and takes account of atmospheric refraction and the Earth's curvature.
- 1.8.3 The resulting ZTV plots are overlaid on Ordnance Survey mapping at an appropriate scale and presented as figures using desktop publishing/graphic design software.
- 1.8.4 Resoft Wind Farm© software is used to calculate cumulative ZTV plots based on the intervisibility of the Proposed Development with other existing, consented and application wind farms included in the CLVIA. In addition to the methods as described above, the layouts and geometries of the surrounding existing, consented and application wind farms are loaded into the same computer programme.

Methodology for Baseline Photography

- 1.8.5 Once a viewpoint has been selected, it is visited, confirmed, and assessed with the aid of a wireline or similar visualisation in the field. A photographic record is taken to record the view and the details of the viewpoint location and associated data are recorded to assist in the production of visualisations and to validate their accuracy. All site photography included in the LVIA is taken in accordance with Visual Representation of Development Proposals. Technical Guidance Note 06/19⁵.
- 1.8.6 The following photographic information is recorded:
- Date, time, weather conditions and visual range;
 - GPS recorded 12 figure grid reference accurate to ~5 m;
 - GPS recorded Above Ordnance Datum (AOD) height data;
 - The focal length of lens is confirmed;

- Horizontal field of view (in degrees); and
 - Bearing to Target Site (Proposed Development).
- 1.8.7 All photographs included in this assessment were recorded with a digital SLR camera set to produce photographs equivalent to that of a manual 35 mm SLR camera with a fixed 50mm focal length lens.
- 1.8.8 All the resulting visualisations have been prepared to show other cumulative wind energy development in order that they may assist the cumulative assessment as well as the LVIA.
- 1.8.9 Whilst no two-dimensional image can fully represent the real viewing experience, the visualisation aims to provide a realistic representation of the Proposed Development, based on current information and photomontage methodology.

Weather Conditions

- 1.8.10 GLVIA3 para 8.22 states:
- 1.8.11 *“In preparing photomontages, weather conditions shown in the photographs should (with justification provided for the choice) be either:*
- *representative of those generally prevailing in the area; or*
 - *taken in good visibility, seeking to represent a maximum visibility scenario when the development may be highly visible”*.¹
- 1.8.12 In preparing photomontages for the LVIA, photographs will be taken in favourable weather conditions that are representative of the weather conditions generally and where possible, will be taken during periods of ‘good’ or ‘excellent’ visibility conditions.

Methodology for Production of Visualisations

- 1.8.13 The view from each viewpoint has been illustrated with a photograph, a wireline and a photomontage indicating the Proposed Development. It should be noted however, that the SNH guidance advises that beyond 20km the visibility of turbines in the printed photomontages is difficult to see or reproduce realistically.
- 1.8.14 The wirelines and photomontages are produced using Resoft Wind Farm© software to generate a perspective view of the wind farm. This software creates a 3D computer model of the existing landscape and the development using digital terrain data and models representing the specified geometry and position of the proposed turbines. The computer model includes the entire LVIA Study Area and all visualisations take account of the effects caused by atmospheric refraction and the Earth's curvature. The computer model does not take account of the screening effects of any intervening objects and forestry, unless specified (see individual figures).
- 1.8.15 A wireline of the Proposed Development and the existing landform is generated for each viewpoint within the LVIA Study Area. These wirelines are used to assist the assessment on location at each viewpoint, the position of which, if required, is adjusted on site to achieve the most visible vantage-point of the Proposed Development (e.g. to avoid buildings, forestry, and general foreground clutter, potentially interfering with the view). Photographs are then taken using a digital SLR camera in combination with a panoramic head equipped tripod. Detailed information is then recorded on site to enable the accurate alignment of the photographs with the wireline model (data such as: GPS grid co-ordinates; ground level information; compass bearings; and any other known references and viewpoint information).

- 1.8.16 The photographs from the viewpoint are then joined to form a planar or cylindrical projection image or panorama as required by the SNH guidance, using computer software to remove ‘barrel distortion’ caused by the camera lens. This panorama, combined in Resoft Wind Farm© with the data recorded on site, enables the wireline to be superimposed and aligned. To produce the photomontage, the wireline turbines are rendered to appear ‘life-like’ considering the time of the photography and weather conditions occurring on the day.
- 1.8.17 Site infrastructure, including the site access, on-site access tracks and crane hard standing areas and the substation may also be theoretically illustrated in the photomontages for closer-range viewpoints to inform the assessment conclusions, however this was assessed not be required because the lower parts of the turbine towers and ground level infrastructure would be screened from the closer range viewpoints where there is a potential for this site infrastructure to influence the overall magnitude of change.
- 1.8.18 The completed panoramas, wirelines, photomontages and accompanying data are then presented as figures using desktop publishing/graphic design software in accordance with referenced SNH and Landscape Institute guidelines.

Printing of Maps and Visualisations

- 1.8.19 All electronic visualisations and maps should be printed out and viewed at the correct scale as noted on the document.

1.9 Glossary of Terms and Abbreviations

- 1.9.1 Note: Those descriptions marked with an asterisk are as per the terminology provided in the GLVIA3¹ glossary.

Term/abbreviation	Definition
AOD	Above Ordnance Datum
AoV	Angle of View
Artificial light	Light produced by electrical means.
BT	Blade Tip
Candela	A unit of measure of luminous intensity, in a given direction.
CLVIA	Cumulative Landscape and Visual Impact Assessment
Constant light	Uninterrupted light source over a given time period.
Cumulative effects	Additional changes caused by a proposed development in conjunction with other similar developments or as a combined effect of a set of developments, taken together’ (SNH, 2012)
Cumulative landscape effects	Effects that ‘can impact on either the physical fabric or character of the landscape, or any special values attached to it’ (SNH, 2012)

Term/abbreviation	Definition
Cumulative visual effects: In combination In succession Sequentially	<p>Effects that can be caused by combined visibility, which ‘occurs where the observer is able to see two or more developments from one viewpoint’ and/or sequential effects which ‘occur when the observer has to move to another viewpoint to see different developments’ (SNH 2012)</p> <ul style="list-style-type: none"> • In combination: Where two or more developments are or would be within the observer’s arc of vision at the same time without moving his/her head (GLVIA3¹, Table 7.1). • In succession: Where the observer has to turn his/her head to see the various developments – actual and visualised (GLVIA3¹, Table 7.1). • Sequential cumulative effect. Occurs where the observer has to move to another viewpoint to see the same or different developments. Sequential effects may be assessed for travel along regularly used routes such as major roads or popular paths (GLVIA3¹, Table 7.1).
Darkness survey	Visual survey the night-time environment and the identification of artificial light sources.
Development*	Any proposal that results in change to the landscape and/or visual environment.
Degree of change	A combination of the scale, extent and duration of an effect also defined as ‘magnitude’.
Designated Landscape*	Areas of landscape identified as being of importance at international, national or local levels, either defined by statute or identified in development plans or other documents.
Direct light	The artificial light source is visible. Note that light emanating from the window of a building is considered to be a ‘direct’ light source.
EIA	Environmental Impact Assessment
Elements*	Individual parts which make up the landscape, such as, for example, trees, hedges and buildings.
Enhancement*	Proposals that seek to improve the landscape resource of the site and its wider setting beyond its baseline condition.
Environmental fit	The relationship of a development to identified environmental opportunities and constraints in its setting.
Feature*	Particularly prominent or eye-catching elements in the landscape such as tree clumps, church towers or wooded skylines OR a particular aspect of the project proposal.
FoV	Field of View – the horizontal angle of the view illustrated in a visualisation.
Geographical Information System (GIS)	A system that captures, stores, analyses, manages and presents data linked to location. It links spatial information to a digital database.

Term/abbreviation	Definition
GLVIA 3	Guidelines for Landscape and Visual Impact Assessment, Third Edition, published jointly by the Landscape Institute and Institute of Environmental Management and Assessment, 2013.
Heritage	The historic environment and especially valued assets and qualities such as historic buildings and cultural traditions.
HH	Hub Height
Historic Landscape Characterisation (HLC) and Historic Land-use Assessment (HLA)	Historic characterisation is the identification and interpretation of the historic dimension of the present-day landscape or townscape within a given area. HLC is the term used in England and Wales, HLA is the term used in Scotland.
Indirect effects*	Direct effects relate to the host landscape and concern both physical and perceptual effects on the receptor. Indirect effects relate to those landscapes and receptors which separated by distance or remote from the development and therefore are only affected in terms of visual or perceptual effects. The Landscape Institute also defines indirect effects as those which are not a direct result of the development but are often produced away from it or as a result of a complex pathway.
Indirect light	The light source is not visible but the light emanating from the source is apparent.
Infrared light	A type of light not visible to the human eye.
Iterative design process	The process by which project design is amended and improved by successive stages of refinement which respond to growing understanding of environmental issues.
Key characteristics	Those combinations of elements which are particularly important to the current character of the landscape and help to give an area its particularly distinctive sense of place.
LANDMAP	LANDMAP is a whole landscape approach that covers all landscapes, designated and non-designated, it covers the natural, rural, peri-urban and urban areas in Wales, (excluding the Cities of Cardiff and Swansea), it includes inland waters and coastal areas to the low water mark. LANDMAP is an all-Wales GIS (Geographical Information System) based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set. In Wales, LANDMAP is the formally adopted methodology for landscape assessment and is advocated by Planning Policy Wales.
Land cover	The surface cover of the land, usually expressed in terms of vegetation cover or lack of it. Related to but not the same as land use.
Landscape and Visual Impact Assessment (LVIA)	A tool used to identify and assess the likely significance of the effects of change resulting from development both on the landscape as an environmental resource in its own right and on people's views and visual amenity.

Term/abbreviation	Definition
Landscape Character Assessment	The process of identifying and describing variation in the character of the landscape, and using this information to assist in managing change in the landscape. It seeks to identify and explain the unique combination of elements and features that make landscapes distinctive. The process results in the production of a Landscape Character Assessment.
Landscape character*	A distinct, recognisable, and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape classification	A process of sorting the landscape into different types using selected criteria but without attaching relative values to different sorts of landscape.
Landscape constraints	Components of the landscape resource such as views or mature trees recognised as constraints to development. Often associated with landscape opportunities.
Landscape effects*	<p>Effects on the landscape as a resource in its own right.</p> <p>An assessment of landscape effects deals with the effects of change and development on landscape as a resource. The concern here is with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. (GLVIA3¹, Para 5.1).</p>
Landscape fit	The relationship of a development to identified landscape opportunities and constraints in its setting.
Landscape patterns	Spatial distributions of landscape elements combining to form patterns, which may be distinctive, recognisable, and describable e.g. hedgerows and stream patterns.
Landscape quality (condition)*	A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Landscape qualities	A term used to describe the aesthetic or perceptual and intangible characteristics of the landscape such as scenic quality, tranquillity, sense of wildness or remoteness. Cultural and artistic references may also be described here.
Landscape receptors *	Defined aspects of the landscape resource that have the potential to be affected by a proposal
Landscape resource	The combination of elements that contribute to landscape context, character, and value.
Landscape sensitivity	The sensitivity of the landscape to a particular development considers the susceptibility of the landscape and its value.
Landscape strategy	The overall vision and objectives for what the landscape should be like in the future, and what is thought to be desirable for a particular landscape type or

Term/abbreviation	Definition
	area as a whole, usually expressed in formally adopted plans and programmes or related documents.
Landscape value*	<p>The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a whole variety of reasons.</p> <p>The value of the landscape units that may be affected, based on review of any designations at both national and local levels, and, where there are no designations, judgements based on criteria that can be used to establish landscape value.</p>
Level of effect	Determined through the combination of sensitivity of the receptor and the proposed magnitude of change brought about by the development.
Lux	A unit of illumination, the amount of light on a surface per unit area.
Magnitude (of effect)*	A term that combines judgements about the size and scale of the effect, the extent of the area over which it occurs, whether it is reversible or irreversible and whether it is short term or long term in duration.
Mitigation	Measures which are proposed to prevent, reduce and where possible offset any significant adverse effects (or to avoid, reduce and if possible remedy identified effects. (GLVIA3 ¹ , Para 3.37).
NRW	Natural Resources Wales
Natural light	Light supplied by the sun, directly or indirectly, the moon and stars.
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Perceptual Aspects	A landscape may be valued for its perceptual qualities, notably wildness and/or tranquillity. (GLVIA3 ¹ , Box 5.1)
Photomontage*	A visualisation which superimposes an image of the proposed development upon a photograph or series of photographs.
Beneficial or Adverse Types of Landscape Effect	<p>The landscape effects may be beneficial, neutral, or adverse.</p> <p>In landscape terms – a beneficial effect would require development to add to the landscape quality and character of an area. Neutral landscape effects would include low or negligible changes that may be considered as part of the ‘normal’ landscape processes such as maintenance or harvesting activities. A adverse effect may include the loss of landscape elements such as mature trees and hedgerows as part of construction leading to a reduction in the landscape quality and character of an area.</p>
Beneficial or Adverse Types of Visual Effect	<p>The visual effects may be beneficial, neutral, or adverse.</p> <p>In visual terms – beneficial or adverse effects are less easy to define or quantify and require a subjective consideration of a number of factors affecting the view, which may be beneficial, neutral, or adverse. Opinions as to the visual effects of wind energy developments vary widely, however it is not the assumption of this assessment that all change, including substantial levels of</p>

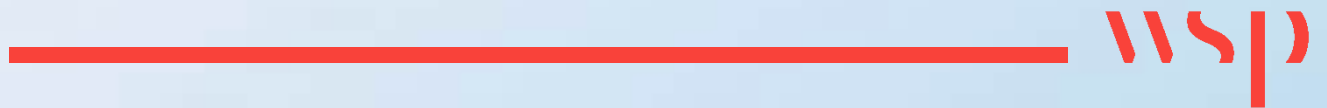
Term/abbreviation	Definition
	change is a adverse experience. Rather this assessment has considered factors such as the visual composition of the landscape in the view together with the design and composition, which may or may not be reasonably, accommodated within the scale and character of the landscape as perceived from the receptor location.
Probability of Effect	The probability of a landscape and visual effect occurring as a result of this Development should be regarded as certain, subject to the stated project design and the continuance of the existing, baseline landscape resource, including known changes such as other permitted wind farm development. The probability of cumulative effects however is variable. Whereas those effects related to existing wind energy development and those under construction are considered as certain, effects related to development with planning consent are only considered as likely. Wind energy development sites for which there is a submitted planning application are considered as uncertain and other wind energy development for which no planning application has been made are considered as uncertain / unknown, as the level of uncertainty would be greater.
Proximity activated lighting	Lighting which is turned on by the detection of moving objects, such as aircraft detected by radar.
Rarity	The presence of rare elements or features in the landscape or the presence of a rare Landscape Character Type. (GLVIA3 ¹ , Box 5.1)
RD	Rotor Diameter
Receptor	Physical landscape resource, special interest, or viewer group that will experience an effect.
Recreation Value*	Evidence that the landscape is valued for recreational activity where experience of the landscape is important. (GLVIA3 ¹ , Box 5.1)
Representativeness*	Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.
Residual effects	Likely environmental effects, remaining after mitigation.
Scale Indicators	Landscape elements and features of a known or recognisable scale such as houses, trees, and vehicles that may be compared to other objects, where the scale of height is less familiar, to indicate their true scale.
Scenic quality	Depends upon perception and reflects the particular combination and pattern of elements in the landscape, its aesthetic qualities, its more intangible sense of place or 'genius loci' and other more intangible qualities. (GLVIA3 ¹ , Box 5.1)
Seascape	Landscapes with views of the coast or seas, and coasts and adjacent marine environments with cultural, historical and archaeological links with each other.
Sense of Place (genius loci)	The essential character and spirit of an area: 'genius loci' literally means 'spirit of the place'.

Term/abbreviation	Definition
Sensitivity*	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value associated to that receptor.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Significant Effects	<p>It is a requirement of the EIA Regulations to determine the likely significant effects of the development on the environment which should relate to the level of an effect and the type of effect.</p> <p>The significance of an effect gives an indication as to the degree of importance (based on the magnitude of the effect and the sensitivity of the receptor) that should be attached to the impact described.</p> <p>Whether or not an effect should be considered significant is not absolute and requires the application of professional judgement.</p> <p>Significant – ‘noteworthy, of considerable amount or effect or importance, not insignificant or negligible’. The Concise Oxford Dictionary.</p> <p>Those levels and types of landscape and visual effect likely to have a major or important / noteworthy or special effect of which a decision maker should take particular note.</p>
Sky glow	The brightness of the night sky in a built-up area as a result of light pollution, apparent as a diffuse artificial light in the sky above major towns and cities.
SNH	Scottish Natural Heritage
Susceptibility*	The ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences.
Sustainability*	The principle that the environment should be protected in such a condition and to such a degree that ensures new development meets the needs of the present without compromising the ability of future generations to meet their own needs.
Temporary or permanent effects	Effects may be considered as temporary or permanent. In the case of wind energy development the application is for a 30-year period after which the assessment assumes that decommissioning will occur and that the site will be restored. For these reasons the development is referred to as long term and reversible.
Time depth	Historical layering – the idea of landscape as a ‘palimpsest’, a much written-over asset of landscape.
Townscape	The character and composition of the built environment including the buildings and the relationships between them, the different types of urban open space, including green spaces, and the relationship between buildings and open spaces.
True View Visuals	A mobile 3D augmented reality (AR) tool used to aid with the assessment. The True View Visuals tool indicates visibility of the Proposed Development to assist in confirming viewpoint positions as well as indicating limited or no visibility of turbines in particular locations. Whilst the images are indicative

Term/abbreviation	Definition
	only, the AR tool provides a comparable image to the accurate wirelines produced.
Type or Nature of effect	Whether an effect is direct or indirect, temporary or permanent, beneficial (positive), neutral or adverse (negative) solus or cumulative.
Viewpoints	<p>Selected for illustration of the visual effects fall broadly into three groups:</p> <p>Representative Viewpoints: selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example certain points may be chosen to represent the view of users of particular public footpaths and bridleways;</p> <p>Specific Viewpoints: chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, such as landscapes with statutory landscape designations or viewpoints with particular cultural landscape associations.</p> <p>Illustrative Viewpoints: chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations. (GLVIA3¹, Para 6.19)</p>
Visual amenity	The overall views and surroundings, which provide a visual setting or backdrop to the activities of people living, working, participating in recreational activities, visiting or travelling through an area.
Visual dominance	A visual effect often referred to in respect of residential properties that in relation to development would be subject to blocking of views, or reduction of light / shadowing, and high levels of visual intrusion.
Visual effect*	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors*	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual sensitivity	The sensitivity of visual receptors such as residents, relative to their location and context, to visual change proposed by development.
Visualisation	Computer visualisation, photomontage, or other technique to illustrate the appearance of the development from a known location.
Wireline / Wireframe	A computer-generated line drawing of the DTM (digital terrain model) and the proposed development from a known location.
Zone of Theoretical Visibility (ZTV)*	A map, usually digitally produced, showing areas of land within which, a development is theoretical visible.

Appendix B

NON-DESIGNATED HERITAGE ASSETS



Appendix B

Non-Designated Heritage Assets

Table B1 Non-Designated historic assets within 1km study area (GGAT HER)

HER Ref.	Name	Easting	Northing	Period	Type
GGAT00124g	Pont-mynach Bridge	321580	193680	Medieval	Bridge
GGAT00125m	Former Dam of Cwncarn Canal Reservoir	322243	193541	POST MEDIEVAL	Dam
GGAT00127g	Chapel Farm, Abercarn (Trefcarn Grange Chapel)	321590	193840	Medieval	Chapel
GGAT00128g	Barn / Chapel, Abercarn	321620	193890	Medieval	Barn
GGAT00129g	17th Century Outer Kitchen	321630	193870	Medieval	Building
GGAT00130g	Human Remains, Skeleton Row	321680	193700	Medieval	Inhumation
GGAT00132g	Aber-carn Grange	322100	193600	Medieval	Grange
GGAT02205g	Blaen Gotappy; Rhyswg Ganol	323840	194800	POST MEDIEVAL	House
GGAT02936g	the Ranks, Abercarn	321550	194960	POST MEDIEVAL	House
GGAT03658g	Rhyswg Fawr Farmhouse and Barrow	322650	194580	POST MEDIEVAL	Farmhouse
GGAT04335g	St Luke's Church, Abercarn	321640	195080	Modern	Church
GGAT04366g	Craig Furnace	324000	196000	POST MEDIEVAL	Furnace
GGAT04874g	Abercarn, Charcoal Blast Furnace	321622	194866	POST MEDIEVAL	Furnace
GGAT04930g	Quarry	324350	195600	Unknown	Quarry
GGAT04938g	Cnwc Hillside	323249	193949	POST MEDIEVAL	Farm
GGAT04939g	Pen-y-pant	323800	194100	POST MEDIEVAL	Farmhouse
GGAT04940g	Rhyswg Fach Farmstead	324100	194100	Unknown	Farmhouse
GGAT04941g	Ty'n-y-ffynon, Henllys	324700	194000	POST MEDIEVAL	Farmhouse
GGAT04942g	Coed Odyn Quarry	324500	194000	Unknown	Quarry
GGAT04943g	Medart	323200	193700	Not Applicable	Natural feature
GGAT04952g	Building, Penbwrch / Pantygwyn	325000	194300	Unknown	Building
GGAT04974g	Small Building, Abercarn	322700	195600	Unknown	Building
GGAT05029g	Colliery, Cwm Carn	323500	193500	POST MEDIEVAL	Colliery
GGAT05030g	Ruined Barn, Abercarn	322200	194300	POST MEDIEVAL	Barn
GGAT05031g	Ruined Barn, Abercarn	323300	194800	POST MEDIEVAL	Barn
GGAT07168g	Quarry, Abercarn	322249	194931	Modern	Quarry
GGAT07198g	Barn, Abercarn	324086	194138	POST MEDIEVAL	Barn
GGAT07199.0g	Cwncarn Colliery Inclined Tramway	323238	193624	POST MEDIEVAL	Tramway
GGAT07283g	Quarry, Abercarn	321218	194235	Modern	Quarry
GGAT07285g	Reservoir, Abercarn	321160	194084	Modern	Reservoir
GGAT07286g	Structure, Abercarn	321116	194046	Modern	Structure

GGAT07288g	Quarry, Abercarn	321926	193931	Modern	Quarry
GGAT07290g	Quarry, Abercarn	321868	194231	Modern	Quarry
GGAT07291g	Quarry, Abercarn	321940	194109	Modern	Quarry
GGAT07330g	House, Abercarn, Caerphilly	322427	195206	POST MEDIEVAL	House
GGAT07331g	Quarry, Abercarn, Caerphilly	322454	194823	Modern	Quarry
GGAT07332g	Reservoir, Abercarn, Caerphilly	322448	195100	Modern	Reservoir
GGAT07333g	Footbridge, Abercarn, Caerphilly	323754	195945	Modern	Footbridge
GGAT07334g	Structure, Abercarn, Caerphilly	323413	195483	POST MEDIEVAL	Structure
GGAT07336g	Boundary Stones, Abercarn, Caerphilly	324144	195327	UNKNOWN	Stone
GGAT07338g	Stones, Abercarn, Caerphilly	324766	195424	POST MEDIEVAL	Stone
GGAT07339g	Stone, Abercarn, Caerphilly	324896	195224	POST MEDIEVAL	Stone
GGAT07340g	Stone, Abercarn, Caerphilly	324541	194532	POST MEDIEVAL	Stone
GGAT07341g	Stones, Abercarn, Caerphilly	324534	194750	POST MEDIEVAL	Stone
GGAT07342g	Former Trig point, Abercarn, Caerphilly	324346	195028	Modern	Triangulation point
GGAT07345g	Quarry	324974	194606	POST MEDIEVAL	Quarry
GGAT07346g	Level, Henllys	324941	194554	POST MEDIEVAL	Colliery
GGAT07354g	Quarry, Abercarn, Caerphilly	322215	194785	Modern	Quarry
GGAT07355g	Trial Level, Abercarn, Caerphilly	322519	195078	Modern	Colliery
GGAT07405g	Rock Cottage	324002	193527	Modern	COTTAGE
GGAT07406g	Quarry, Henllys, Torfaen	324280	193716	POST MEDIEVAL	Quarry
GGAT07407g	Quarry, Henllys, Torfaen	324381	193836	POST MEDIEVAL	Quarry
GGAT07408g	Quarry, Henllys, Torfaen	324825	194165	POST MEDIEVAL	Quarry
GGAT07409g	Quarry, Abercarn, Caerphilly	324454	194089	POST MEDIEVAL	Quarry
GGAT07410g	Rectangular structure, Abercarn	323059	194023	POST MEDIEVAL	Structure
GGAT07411g	House, Abercarn, Caerphilly	322904	193949	POST MEDIEVAL	House
GGAT07412g	Trackway	323124	193985	POST MEDIEVAL	Trackway
GGAT07439g	Quarry, Abercarn, Caerphilly	321915	194459	Modern	Quarry
GGAT07509m	Drill Hall, Abercarn	321680	193835	Modern	Drill hall
GGAT07514g	Coed Odyn Well I	324578	193848	POST MEDIEVAL	Well
GGAT07515g	Well, Henllys, Torfaen	324599	193772	POST MEDIEVAL	Well
GGAT07725g	Welsh Presbyterian Church, Abercarn	321730	195010	POST MEDIEVAL	Church
GGAT08326g	Rhyswg Grange	322700	194600	Medieval	Grange
GGAT08370g	Trefcarn Grange	321600	193800	Medieval	Grange

GGAT08562g	Abercarn War Memorial, Market Square	321600	194950	Modern	War memorial
GGAT08563g	English Baptist Church, Abercarn, Caerphilly	321740	194180	POST MEDIEVAL	Church
GGAT08564g	Cwmcarn War Memorial, Abercarn	322045	193495	Modern	War memorial
GGAT08566g	The Gables House and Terraced Steps, Abercarn	321610	194770	Modern	House
GGAT09417g	Varman's Yard	321630	194820	POST MEDIEVAL	wall
GGAT09418g	Quarry, Abercarn	321745	194820	POST MEDIEVAL	quarry
GGAT11380g	Weir, Pont-y-warn	321955	193120	POST MEDIEVAL	WEIR
GGAT12188g	Lower Tin Plate Works, Abercarn	321370	194598	POST MEDIEVAL	TINPLATE WORKS
GGAT12199g	Upper Tin Plate Works	321600	195250	POST MEDIEVAL	TINPLATE WORKS
GGAT12281g	Cefn-rhyswg Ridge	323300	194800	UNKNOWN	UNASSIGNED
GGAT12282g	Coed-y-rhiw Wood	322500	194300	UNKNOWN	MANAGED WOODLAND
GGAT12283g	Craig-lapi Wood	323700	194600	UNKNOWN	MANAGED WOODLAND
GGAT12284g	Craig-llwyfas Wood	321900	194500	UNKNOWN	MANAGED WOODLAND
GGAT12285g	Cwm-caer-lapi Valley	323100	194400	UNKNOWN	UNASSIGNED
GGAT12286g	Graig-ddu Wood	322800	194900	UNKNOWN	MANAGED WOODLAND
GGAT12288g	Abergwyddon Mill	321400	195000	MEDIEVAL	MILL
GGAT15408g	Weir, Aber Carn	321879	193143	UNKNOWN	WEIR
GGAT16164g	Cottage Coachhouse, Caerphilly	321744	194933	MODERN	COACH HOUSE
GGAT16533g	Full Gospel Mission, Commercial Road, Abercarn	321640	194380	POST MEDIEVAL	CHAPEL
GGAT17031g	Stone, Greatoak	324073	193882	UNKNOWN	STONE
GGAT17052g	Quarry, Craig y Darren	321116	194923	POST MEDIEVAL	QUARRY
GGAT17063g	Tramway, Abercarn	321575	193564	POST MEDIEVAL	TRAMWAY
GGAT17084g	Spring, Abercarn	323723	196030	POST MEDIEVAL	SPRING
GGAT17085g	Spring, Abercarn	323742	196009	POST MEDIEVAL	SPRING
GGAT17086g	Structure, Abercarn	323809	196097	POST MEDIEVAL	STRUCTURE
GGAT17087g	Structure, Abercarn	324167	196059	POST MEDIEVAL	STRUCTURE
GGAT17088g	Spring, Abercarn	323962	195339	POST MEDIEVAL	SPRING
GGAT17089g	Spring, Abercarn	323997	195332	POST MEDIEVAL	SPRING
GGAT17090g	Structure, Abercarn	322732	194063	POST MEDIEVAL	STRUCTURE
GGAT17091g	Spring, Abercarn	323306	193762	POST MEDIEVAL	SPRING
GGAT17092g	Spring, Abercarn	323407	194410	POST MEDIEVAL	SPRING
GGAT17093g	Stone, Abercarn	324073	193882	UNKNOWN	STONE

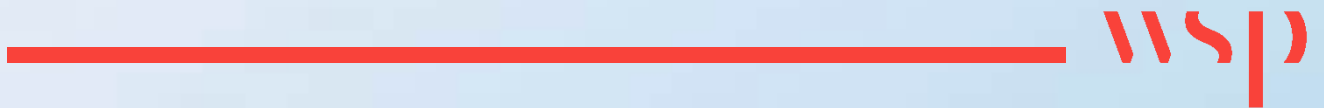
GGAT17094g	Stone	324100	193903	UNKNOWN	STONE
GGAT17095g	Stone	324138	193939	UNKNOWN	STONE
GGAT17096g	Stone	324187	193988	UNKNOWN	STONE
GGAT17097g	Stone	324234	194023	UNKNOWN	STONE
GGAT17098g	Stone	324281	194064	UNKNOWN	STONE
GGAT17099g	Stone	324330	194104	UNKNOWN	STONE
GGAT17100g	Stone	324350	194140	UNKNOWN	STONE
GGAT17101g	Stone	324381	194188	UNKNOWN	STONE
GGAT17102g	Stone	324417	194238	UNKNOWN	STONE
GGAT17103g	Stone	324450	194290	UNKNOWN	STONE
GGAT17104g	Stone	324482	194338	UNKNOWN	STONE
GGAT17105g	Stone	324535	194324	UNKNOWN	STONE
GGAT17106g	Spring	324485	194569	POST MEDIEVAL	SPRING
GGAT17107g	Stone	324555	194636	UNKNOWN	STONE
GGAT17108g	Stone	324543	194665	UNKNOWN	STONE
GGAT17109g	Stone	324540	194686	UNKNOWN	STONE
GGAT17110g	Stone	324528	194785	UNKNOWN	STONE
GGAT17111g	Stone	324524	194837	UNKNOWN	STONE
GGAT17112g	Stone	324513	194885	UNKNOWN	STONE
GGAT17113g	Stone	324506	194945	UNKNOWN	STONE
GGAT17114g	Spring	324682	195119	UNKNOWN	STONE
GGAT17115g	Sheep Fold	324993	194810	POST MEDIEVAL	SHEEP FOLD
GGAT17116g	Footbridge	325005	194768	POST MEDIEVAL	FOOTBRIDGE
GGAT17117g:	Spring	325036	194793	POST MEDIEVAL	SPRING
GGAT17130g	Spring	322684	195213	POST MEDIEVAL	SPRING
GGAT17131g	Spring	323974	193532	POST MEDIEVAL	SPRING
GGAT17132g	Spring	324562	194489	POST MEDIEVAL	SPRING
GGAT17137g	Rifle Range	322338	194973	MODERN	FIRING RANGE
GGAT17138g	Structure	322546	194305	MODERN	STRUCTURE
GGAT17139g	Stone	324716	195409	UNKNOWN	STONE
GGAT17140g	Stone	324841	195438	UNKNOWN	STONE
GGAT17147g	Quarry, Abercarn	323872	194142	MODERN	QUARRY
GGAT17153g	Stone, Abercarn	322995	193792	UNKNOWN	STONE
GGAT17156g	Ford	325005	194768	MODERN	FORD
GGAT17158g	Spring, Abercarn	322739	193660	POST MEDIEVAL	SPRING
GGAT17159g	Structure, Abercarn	322799	193649	POST MEDIEVAL	STRUCTURE
GGAT17160g	Structure, Abercarn	322807	193653	POST MEDIEVAL	STRUCTURE
GGAT17161g	Structure, Abercarn	322815	193656	POST MEDIEVAL	STRUCTURE
GGAT17172g	Sheepwash	325033	194796	POST MEDIEVAL	SHEEP WASH
GGAT17173g	Sheepwash	325041	194802	POST MEDIEVAL	SHEEP WASH
GGAT17200g	Weir, Ebbw	321495	195193	UNKNOWN	WEIR
GGAT17201g	Abercarn Railway Bridge	321363	195180	UNKNOWN	RAILWAY BRIDGE

Table B.2 Events recorded within 1km study area (GGAT HER)

HER Ref.	Name	Event Type	Easting	Northing
GGATE007091	Risca Flood Management Scheme, Caerphilly/Newport	FIELD VISIT	321610	193690
GGATE007091	Risca Flood Management Scheme, Caerphilly/Newport	FIELD VISIT	320710	191290
GGATE007091	Risca Flood Management Scheme, Caerphilly/Newport	FIELD VISIT	325960	188760
GGATE007090	Risca Flood Management Scheme, Caerphilly/Newport	DESK BASED ASSESSMENT	321610	193690
GGATE007090	Risca Flood Management Scheme, Caerphilly/Newport	DESK BASED ASSESSMENT	320710	191290
GGATE007090	Risca Flood Management Scheme, Caerphilly/Newport	DESK BASED ASSESSMENT	325960	188760
GGATE006037	Cwmcarn Forest Drive, Caerphilly	DESK BASED ASSESSMENT	322977	193663
GGATE006037	Cwmcarn Forest Drive, Caerphilly	DESK BASED ASSESSMENT	325647	195928
GGATE005647	Monmouthshire and Brecon Canal	DESK BASED ASSESSMENT	321990	192690

Appendix C

DESIGNATED HISTORIC ASSETS WITHIN 1-5KM



Appendix C

Designated Historic Assets Within 1-5km

Table B1 Designated historic assets within 1 to 5km of the Site

Record	Listed Buildings			
	Name	Grade	Easting	Northing
1880	Gelli-groes Mill	II*	317791	194715
1881	Penllwyn, former manor house now Penllwyn Arms public house	II*	317406	195592
1882	Church of St Tudor Mynyddislwyn	II*	319335	193917
1883	Beulah Baptist Church and attached wing and gateway	II	321039	197103
1884	Crumlin Viaduct E Abutment Ebbw Valley	II	321470	198637
1885	Former Barn at Croespenmaen	II	319566	198599
1886	Capel y Babell	II	318568	191411
1887	Former School Room, New Bethel, and attached wall	II	319247	195418
1889	Former Navigation Colliery Offices	II	321146	198725
1890	Former Navigation Colliery Chimney	II*	321107	198790
1891	Former Navigation Colliery South Winding Engine House	II*	321140	198740
1892	Former Navigation Colliery Lamp Room	II	321114	198776
1893	Former Navigation Colliery Workshops and Stores	II	321089	198829
1894	Former Navigation Colliery North Winding Engine House	II*	321105	198841
1895	Former Navigation Colliery Electrical Outbuilding	II	321080	198860
1896	Former Navigation Colliery Power House and Pump House	II*	321120	198860
1897	Former Navigation Colliery Fan House and Fan Drift	II*	321160	198750
1898	Crumlin Old Farmhouse and abutting barn	II	320196	199066
1899	Cwmdows Farmhouse	II*	320480	196923
1900	Rhyswg Fawr Farmhouse and walled forecourt	II	322657	194604
1901	Caerllwyn Isaf and attached byre/stable	II	318616	193410
1902	Cyncoed Farm Cottage	II	319063	197689
1903	Church of St Luke	II*	321640	195077
1904	Gelli-groes Millhouse and attached Barn	II	317773	194696
1905	Bridge over Sirhowy River at Gelligroes	II	317812	194694
1906	Cwmbrynar aka Cwmbraenar Cottage	II	318795	195999
1908	No 2 Garden Suburbs,,Pont-y-Waun Garden Suburb,,GWENT,	II	322217	193062
1909	No 6 Garden Suburbs,,Pont-y-Waun Garden Suburb,,GWENT,	II	322207	193046
1910	No 10 Garden Suburbs,,Pont-y-Waun Garden Suburb,,GWENT,	II	322205	193027
1911	No 22 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,GWENT,	II	322192	192983
1912	No 30 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,GWENT,	II	322193	192942
1913	No 38 Garden Suburbs,,Pont-y-Waun Garden Suburb,,GWENT,	II	322171	192903
1914	No 41 Garden Suburbs, Circus,,Pont-y-Waun Garden Suburb,,GWENT,	II	322167	192992

1915	No 49 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,GWENT,	II	322142	192960
1916	No 57 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II	322127	192869
1917	No 65 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,GWENT,	II	322122	192824
2915	Church of Saint Peter	II*	326771	191038
3134	Capel-Ilwyd	II	327820	198004
3148	Llanderfel Farmhouse	II	326579	195374
3149	Glyn Bran Farmhouse	II	327391	196980
16425	Former Navigation Colliery Powder Store and adjoining N Rear Revetment Wall	II	321079	198903
16426	Former Navigation Colliery Heapstead and Main Revetment Wall	II	321106	198861
16427	Former Navigation Colliery Middle Revetment Wall	II	321089	198886
16428	Former Navigation Colliery Baths	II	321098	199010
20183	Zoar Baptist Chapel	II	327343	192461
20995	Welsh Presbyterian Church	II	321729	195012
20996	Abercarn War Memorial	II	321607	194950
20997	Cwmcarn War Memorial and surrounding railings	II	322058	193498
20998	Barn at Rhyswg Fawr	II	322677	194578
20999	English Baptist Church and walled forecourt	II	321736	194175
21000	English Baptist Church Sunday School	II	321736	194148
21001	Abercarn Aqueduct and bridge (partly in Crosskeys Community)	II	321966	193062
21002	Ty Mynydd	II	320119	195186
21003	Hall's Bridge, Railway Viaduct over River Ebbw and Western Valleys Railway Line	II	321797	192965
21005	Trinity Congregational Church and attached Sunday School	II	322101	192539
21006	Canal Bridge over Monmouthshire and Brecon Canal E of Cwmyr	II	323192	191678
21007	Canal Bridge over Monmouthshire and Brecon Canal at Darren Road	II	323428	191575
21008	Hall's Bridge, Railway Viaduct over River Ebbw and Western Valleys Railway Line	II	321813	192954
21009	Former Railway bridge over canal outfall	II	321940	192728
21010	Homestead	II	322270	192820
21011	Generator Tower	II	322300	192796
21012	Abercarn Aqueduct and Bridge (partly in Abercarn Community)	II	321974	193063
21013	No 1 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322239	193103
21014	No 13 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322197	193084
21015	No 21 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322181	193061
21016	No 29 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322177	193034
21017	No 3 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322233	193102
21018	No 5 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322228	193102
21019	No 7 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322223	193098
21020	No 9 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322219	193098
21021	No 11 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322214	193098
21022	No 15 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322193	193080
21023	No 17 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322191	193075
21024	No 19 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322188	193072
21025	No 23 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322180	193057
21026	No 25 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322179	193052

21027	No 27 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322178	193046
21028	No 31 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322177	193030
21029	No 33 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322175	193024
21030	No 35 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322174	193019
21031	No 37 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322173	193014
21032	No 39 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322172	193010
21033	No 4 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322211	193056
21034	No 8 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322207	193038
21035	No 12 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322203	193024
21036	No 14 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322202	193019
21037	No 16 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322201	193013
21038	No 18 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322200	193009
21039	No 20 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322198	193003
21040	No 43 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322167	192883
21041	No 45 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322157	192986
21042	No 47 Garden Suburbs, Circus	II	322152	192982
21043	No 24 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322195	192977
21044	No 26 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322199	192971
21045	No 28 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322200	192967
21046	No 51 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322143	192951
21047	No 53 Garden Suburbs, Circus	II	322147	192947
21048	No 55 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322152	192942
21049	No 32 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322187	192939
21050	,34 Garden Suburbs, Circus,Pont-y-Waun Garden Suburb,,	II	322181	192935
21051	No 36 Garden Suburbs, Circus,,,Pont-y-Waun Garden Suburb,,,	II	322175	192933
21052	No 59 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322127	192860
21053	No 61 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322125	192852
21054	No 63 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322126	192842
21055	No 67 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322121	192816
21056	No 69 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322120	192809
21057	No 71 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322119	192798
21058	No 40 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322169	192894
21059	No 42 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322168	192885
21060	No 44 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322166	192877
21061	No 46 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322165	192871
21062	No 48 Garden Suburbs,,,Pont-y-Waun Garden Suburb,,,	II	322164	192859
21254	Crumlin Viaduct W Abutment Ebbw Valley	II	321134	198510
21255	Crumlin Viaduct NE Abutment Cwm Kendon	II	321169	198524
21256	Crumlin Viaduct SW Abutment Cwm Kendon	II	321031	198418
21257	Crumlin Old Bridge over River Ebbw	II	321333	198443
21258	Penrhiwlas	II	319828	198497
21262	Viaduct Cottage	II	321127	198568
21265	Pentref-y-Groes	II	319605	198041
21266	Barn and byre range at Pen-y-groes 3	II	319615	198032
21267	Rear Revetment Wall S	II	321149	198699

21308	Church of St John	II	321254	189307
21498	Church of St Paul	II	320709	196793
21499	Church of Our Lady of Peace and attached Presbytery	II*	321067	197620
21500	Celyn Collieries Workmen's Institute	II	320749	196763
21501	Preswylfa	II	320211	196666
21502	Former Hall's tramroad and railway tunnel E portal	II	319791	196386
21503	Former Hall's tramroad and railway tunnel W portal	II	319580	196344
21504	Pentwyn-isaf	II	319925	197165
21513	Former Tramroad Bridge (partly in Pontllanfraith Community)	II	318274	196709
21620	Former Mynyddislwyn Urban District Council Offices	II	317727	195563
21621	Shangri-la	II	317212	195210
21622	War Memorial	II	317783	196028
21623	Siloh Presbyterian Church	II	317633	194761
21624	Pair of chest tombs at Siloh Presbyterian Church	II	317635	194753
21625	Heather Cottage	II	317662	194733
21626	New Bethel Chapel	II	319217	195427
21627	Wall, railings and gates at New Bethel Chapel graveyard	II	319217	195377
21628	Tyle-gwyn	II	317411	194052
21629	Stable range at Tyle-gwyn	II	317404	194072
21630	Garden Wall at Penllwyn	II	317371	195573
21631	Former Tramroad Bridge (partly in Penmaen Community)	II	318269	196714
21632	Monuments to James Thomas and family at New Bethel	II	319222	195411
21633	Monument to Martha Williams at New Bethel	II	319217	195417
21634	Monument to Margaret Williams at New Bethel	II	319209	195418
21635	Monument to Elizabeth Jones at New Bethel	II	319209	195429
21636	Nicholas monument at New Bethel	II	319219	195434
21637	Monument to Rosser Williams at New Bethel	II	319228	195428
21638	Monument to Thomas Henry Thomas at New Bethel	II	319213	195414
22313	Islwyn Monument in Babell Cemetery	II	318578	191410
22314	Former Penllwyn Tramroad Viaduct at Nine Mile Point	II	320350	191088
22315	Lychgate at St Tudor's Church Mynyddislwyn	II	319350	193960
22316	Glebe Farm	II	318616	192925
22317	Brynsgawen and attached farm range	II	317296	192688
22318	Stable block at Brynsgawen	II	317280	192701
22319	The Pioneer Hotel	II	318479	191751
22320	Telephone Call-box outside Pioneer Hotel	II	318499	191742
22321	Ty'n-y-ffynnon	II	320698	190892
22322	Ton-eithin	II	319911	192850
22506	Bethany English Baptist Church and attached Sunday School	II	323922	190269
22507	Moriah Baptist Church	II	323898	190491
22508	Pont Y Mister	II	324579	189563
22509	Canal Bridge over Monmouthshire and Brecon Canal E of Cwmyr (partly in Crosskeys Community)	II	323189	191673
22510	Canal Bridge over Monmouthshire and Brecon Canal W of Penrhiw	II	324025	190991
22511	Canal Bridge over Monmouthshire and Brecon Canal by Moriah Hill	II	324070	190634
22512	Canal Bridge over Monmouthshire and Brecon Canal S of Ty Sign	II	325498	190043
22514	Church of St Mary Risca	II	323668	191177

22515	Entrance Gateway at Churchyard of St Mary Risca	II	323635	191188
22516	Entrance to Tredegar Grounds	II	323895	190401
22517	Jubilee Statue in Tredegar Grounds	II	323940	190415
22518	Former Risca Collieries Workmen's Institute	II	323787	190836
22519	Church of St Mary and St Mercurius	II	323828	190914
22520	Pen-y-van including attached range to left	II	325705	189806
22521	Canal Bridge over Monmouthshire and Brecon Canal at Darran Road (partly in Crosskeys Community)	II	323434	191574
22522	Remains of churchyard cross in St Mary's churchyard	II	323643	191150
22523	Former Risca Palace Cinema	II	323900	190303
22673	Swffryd-ganol including front garden wall	II	322327	199363
22674	Barn Range including cow-house at Swffryd-ganol	II	322337	199334
23533	Church of the Holy Trinity	II	328727	196269
25737	The Gables	II	321609	194769
25738	Terraced steps at The Gables	II	321592	194771
26986	Glan-y-nant Farm	II	328554	194039
27059	Ty'r Ywen Farmhouse	II	326634	194914
27060	Barn at Ty'r Ywen Farm	II	326646	194936
80858	Barn at Capel-Ilwyd	II	327820	198025
80859	Barn at Glyn Bran Farm	II	327375	196989
80860	Outside kitchen at Glyn Bran Farm	II	327390	197000
81033	Cwrt Henllys	II	325680	192124
81034	Pandy-mawr and attached barn	II	326201	192706
81035	Remains of churchyard cross, Church of Saint Peter	II	326763	191017
81859	Aqueduct over Dowlais Brook on Monmouthshire and Brecon Canal, partly in Cwmbran Central Community	II	329051	194006
81869	Lime kiln to N of Pentre-Bach (partly in Cwmbran Central)	II	328542	192286
82034	Lime kiln on S side of Garth Road	II	328721	193956
82035	Aqueduct over Dowlais Brook on Monmouthshire and Brecon Canal (partly in the Llantarnam community)	II	329048	194008
82036	Lime kiln N of Pentre-Bach (partly in the Llantarnam community)	II	328537	192290
82346	Celynen Collieries Workmen's Memorial Hall, including forecourt wall and gates	II*	320739	196737
87492	Iron Bridge in grounds of Woodfield Park	II	317925	197235
87740	St Mary Street War Memorial	II	323402	191402
87741	Commercial Street War Memorial	II	323973	190271
87742	Railings and gates at St Mary Street War Memorial	II	323396	191394
87787	Milepost east of Lower Wyndham Terrace	II	324630	190469

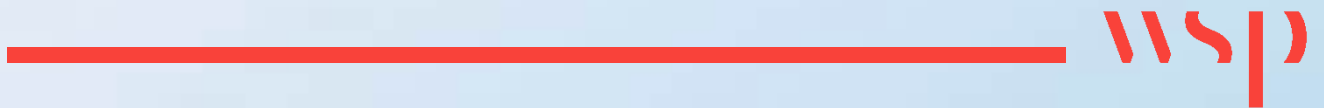
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		Name	easting	northing
589	MM071	Begwns Round Barrow, Mynydd Machen	322376	190010
1033	MM309	St. Peter's Churchyard Cross, Henllys	326764	191017
1096	MM337	House Platforms to W of Mynydd Machen	322190	190091
1441	MM250	Charcoal Blast Furnace at Abercarn	321622	194866
1561	MM271	Llanderfel Church	326394	195299
2349	MM044	Twm-Barlwm Mound and Bailey Castle	324222	192610

2350	MM046	Round Cairn 315m S of Upper Wenallt	325634	190561
2968	MM045	Cairns West of Craig y Dyffryn	325100	192742
2972	MM035	Twyn Tudor	319335	193814
2981	MM096	Fort South of Pen-Llwyn-Fawr	317420	195355
3487	MM256	Iron Ore Scours at Upper Race, Pontypool	327519	198531
3493	MM259	Former Dam of Cwmcarn Canal Reservoir	322243	193536

Local plan area	Conservation Area
CAERPHILLY	Oakdale
TORFAEN	Mon and Brecon Canal
TORFAEN	Upper Cwmbran
CAERPHILLY	Gelligroes
CAERPHILLY	Cwmcarn Memorial Park
CAERPHILLY	Pontywaun Garden Suburbs
CAERPHILLY	Newbridge

Appendix D

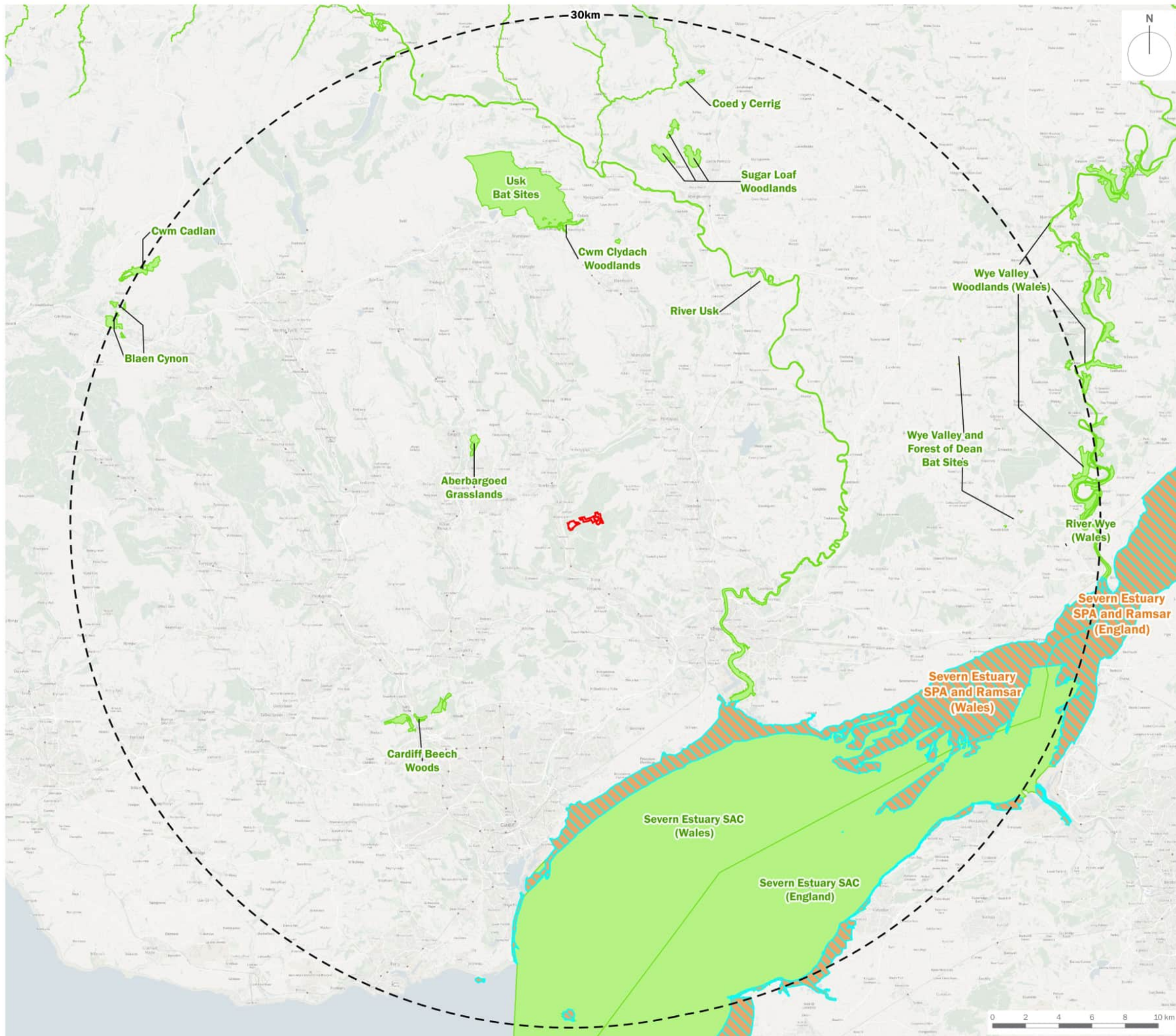
DESIGNATED SITES, PHASE 1 AND POND LOCATIONS



Appendix D.1

DESIGNATED SITES





client
Pennant Walters

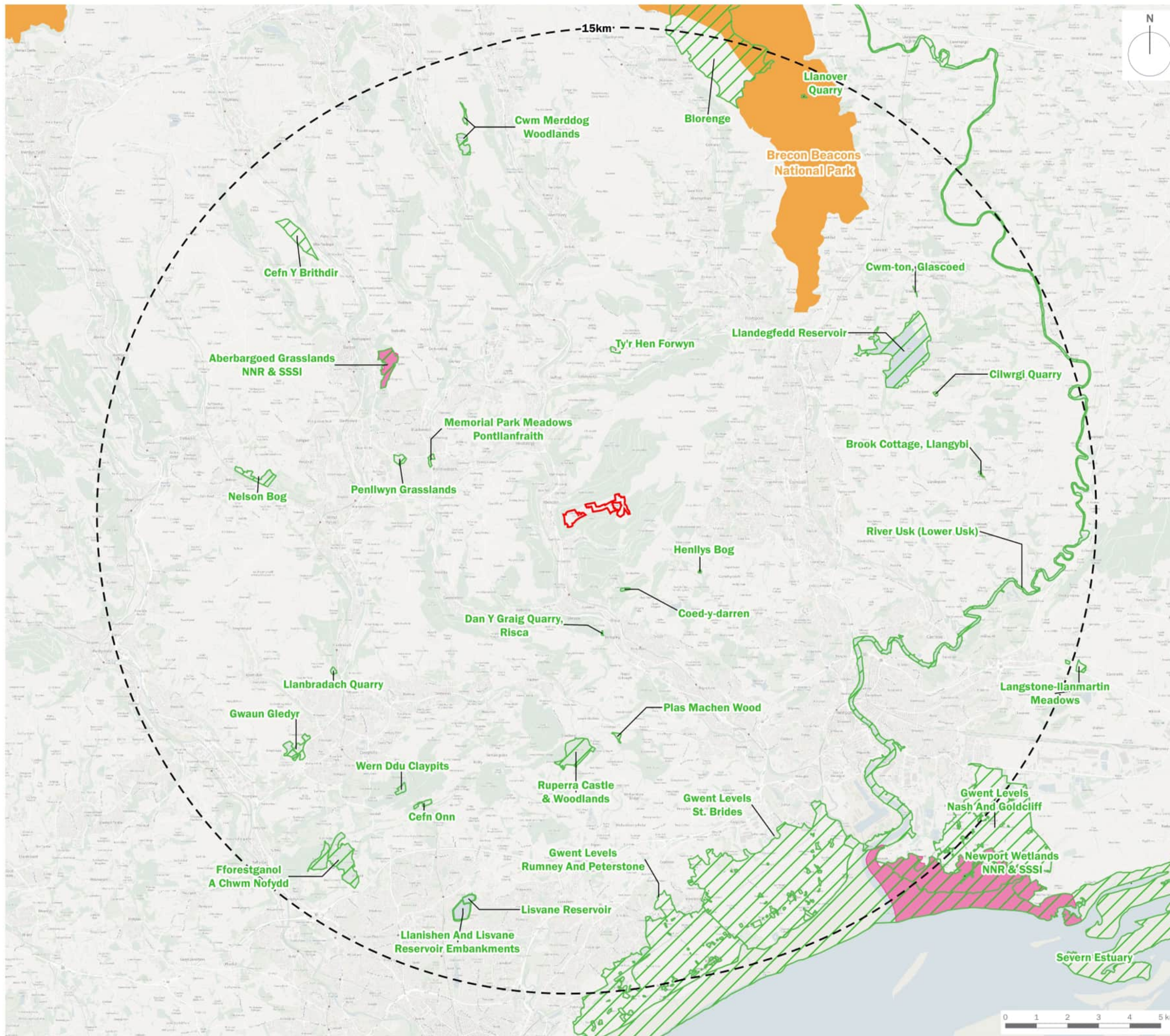
project title
Rhyswg Wind Farm

drawing title
International Designated Sites

date **09 SEPTEMBER 2024** drawn by **MCa**
drawing number **edp6611_d017a** checked **KHe**
scale **1:225,000 @ A3** QA **GYo**



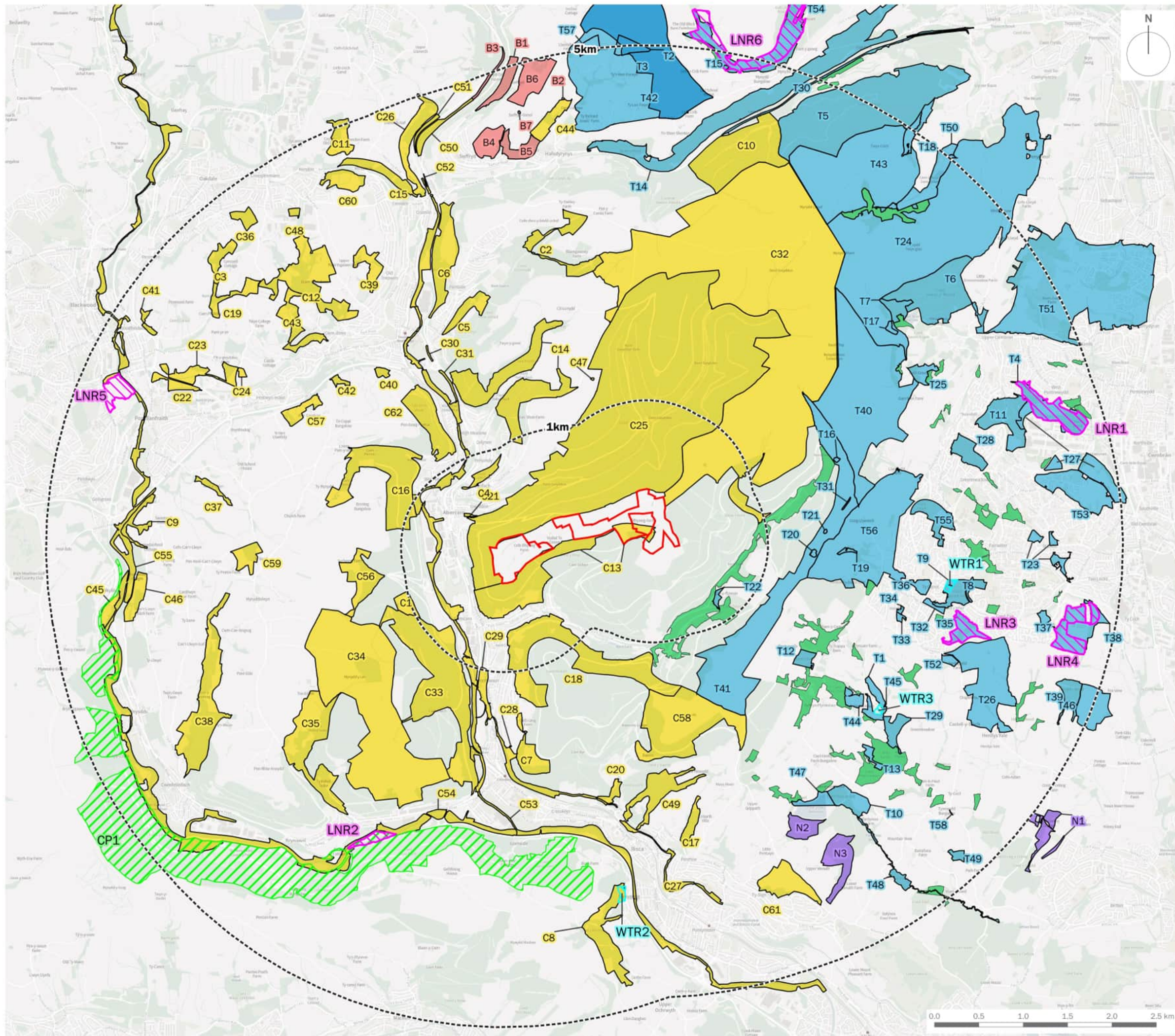
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client	Pennant Walters		
project title	Rhyswg Wind Farm		
drawing title	National Designated Sites		
date	09 SEPTEMBER 2024	drawn by	MCa
drawing number	edp6611_d018a	checked	KHe
scale	1:120,000 @ A3	QA	GYo







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-  Site Boundary
-  Range Ring (1km and 5km)
-  Country Park
-  Local Nature Reserve (LNR)
-  Wildlife Trust Reserve
-  Ancient Semi Natural Woodland

**Sites of Importance for Nature Conservation (SINCs)
(by Local Authority)**

-  Blaenau Gwent
-  Caerphilly
-  Newport
-  Torfaen

- Key to Labels:**
- B - Blaenau Gwent SINC
 - C - Caerphilly SINC
 - CP - Country Park
 - LNR - Local Nature Reserve
 - N - Newport SINC
 - T - Torfaen SINC
 - WTR - Wildlife Trust Reserve

See Sheet 2 for list of site names

client
Pennant Walters

project title
Rhyswg Wind Farm

drawing title
**Non-statutory Designated Sites
(Sheet 1 of 2)**

date **09 SEPTEMBER 2024** drawn by **MCa**
drawing number **edp6611_d019a** checked **KHe**
scale **1:42,000 @ A3** QA **RBa**



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Blaenau Gwent SINC

Label	Name
B1	Craig Swffryd
B2	Cwm Farm Pond
B3	Ebbw River South Tip Section
B4	Sofrydd Quarry
B5	Swffryd Wood
B6	Swffryd-fach
B7	Swyffryd Ganol Pond

Caerphilly SINC

Label	Name
C1	Cil-Fynydd, Cwmcarn
C2	Coed Cil-Lonydd, East of Newbridge
C3	Coed Cwm Philkins, East of Penmaen
C4	Coed Ffordd-Fawr, Abercarn
C5	Coed Gawni, East of Newbridge
C6	Coed Goferau, Crumlin
C7	Coed Mam-Gu, Crosskeys
C8	Coed y Mochyn, Risca
C9	Coedcae Newydd, Gelligroes
C10	Coedcae Watkin Dafydd, East of Crumlin
C11	Crumlin Old Farm Meadows, Crumlin
C12	Cwm Dows Valley, East of Penmaen
C13	Cwm Gofapi Woods, Cwmcarn
C14	Cwm Hafod-Fach Woodlands, North of Abercarn
C15	Cwm Kendon, Crumlin
C16	Cwm Pennar, Abercarn
C17	Cwm-y-Nant, Risca
C18	Cwmcarn Slopes, Cwmcarn
C19	Cyncoed Fields, East of Penmaen
C20	Darran Woodland, Fernlea
C21	Distillery Pond, Abercarn
C22	Enterprise Way Grasslands, Pontllanfraith
C23	Glan-Brynar Woodlands, Pentwynmawr
C24	Greenlands Meadow, Pentwynmawr
C25	Gwydon Valley Woodlands, Abercarn
C26	Llanerch-Isaf Woodland, Crumlin
C27	Monmouth to Brecon Canal
C28	Monmouth to Brecon Canal
C29	Monmouth to Brecon Canal
C30	Monmouth to Brecon Canal
C31	Monmouth to Brecon Canal
C32	Mynydd Maen, East of Newbridge
C33	Mynydd y Lan Woodlands, Cwmcarn
C34	Mynydd y Lan, West of Cwmcarn
C35	Nant Hafod Tudor, East of Cwmfelinfach
C36	Nant Philkins Fields, Oakdale
C37	Nant yr Odyn, East of Pontllanfraith
C38	Nant-y-Draenog, East of Wyllie
C39	Pant-Ysgawen Fields, Treowen
C40	Pen-Rhiw-Bica, South of Newbridge

Caerphilly SINC (continued)

Label	Name
C41	Penmaen Carr, East of Blackwood
C42	Pennar-Ganol, South of Newbridge
C43	Pentwyn-Isaf Woodlands, Pentwynmawr
C44	Pontbren, North of Crumlin
C45	Pontgam Terrace Meadows, Wyllie
C46	Pontgam Terrace Meadows, Wyllie
C47	Pwllgwinau, East of Newbridge
C48	Remploy Factory Grounds, Oakdale
C49	Risca Quarry, Fernlea
C50	River Ebbw
C51	River Ebbw
C52	River Ebbw
C53	River Ebbw
C54	River Sirhowy
C55	River Sirhowy
C56	Sychpant Farm, West of Cwmcarn
C57	Ton-y-Pistyll Fields, Pentwynmawr
C58	Twmbarlwm, North of Risca
C59	Ty Bach Marsh, East of Wyllie
C60	Ty-Mawr Wood, Rhiw
C61	Ty-Sign Meadows, Risca
C62	Tyle-Coch Wood, North of Abercarn

Newport SINC

Label	Name
N1	Bettws West
N2	Craig Y Merchant
N3	Craig y Wenalt

Torfaen SINC

Label	Name
T1	Bank above Nant Y Pandy
T2	Cefn Crib Bog
T3	Cefn y Crib
T4	Church Wood amd Springvale Ponds
T5	Coed Golynos Mixed Woodland
T6	Coed Gwaun-y-fferiad
T7	Coed Gwaun-y-fferiad grasslands
T8	Coed Meyrick Moel
T9	Coed Meyrick Moel grassland
T10	Coed Pant-yr-Eos
T11	Coed-y-Graig Fawr
T12	Coed-y-Moch
T13	Coed-y-Twyrch Pasture
T14	Craig Gwent Wood Ancient Woodland
T15	Disused Quarries - Mynydd Henllys Common
T16	Disused Quarries - Mynydd Henllys Common
T17	Disused Quarries - Mynydd Henllys Common
T18	Disused Quarries - Mynydd Henllys Common
T19	Disused Quarries - Mynydd Henllys Common

Torfaen SINC (continued)

Label	Name
T20	Disused Quarries - Mynydd Henllys Common
T21	Disused Quarries - Mynydd Henllys Common
T22	Disused Quarries - Mynydd Henllys Common
T23	Dowlais Brook and surrounding buffer habitat
T24	Edlogan Common
T25	Gelli Gravog Pastures
T26	Green Court Meadows
T27	Greenmeadow Community Farm
T28	Greenmeadow Wood
T29	Greenmeadow Wood, Henllys
T30	Hafodyrynys Road Verge
T31	Henllys Industrial Balancing Ponds
T32	Henllys Link Meadow
T33	Henllys Meadow - Sycamore Court
T34	Henllys Meadow - Sycamore Court
T35	Henllys Open Space LNR
T36	Henllys Village Fields
T37	Hollybush Meadow
T38	Hollybush Heights (Pentre Fields)
T39	Limekiln Wood
T40	Magna Porta Common
T41	Mynydd Henllys Common
T42	Mynydd Llanhilleth Common
T43	Mynydd Maen and Mynydd Llwyd Common
T44	Pandy Mawr Pasture 1
T45	Pandy Mawr Pasture 2
T46	Pant Glas
T47	Pant yr Rheos
T48	Pantyreos Brook
T49	Park Farm Wood
T50	Penyrheol Marshes
T51	South Sebastopol Grasslands (Fields 2,3,4,5,6 and 14) and Streams
T52	Springfield Meadow
T53	St Dials Meadows/Police Training College
T54	Tirpentwys LNR
T55	Tranch Wood, Cwmbran
T56	Ty Canol Combination SINC - Inc Tyr Y Wen Farm, Penmaes Road Meadow and Land West of Penmaes Road
T57	Ty'r y-wen Farm
T58	Tynewydd Roadside Verge

client

Pennant Walters

project title

Rhyswg Wind Farm

drawing title

**Non-statutory Designated Sites
(Sheet 2 of 2)**

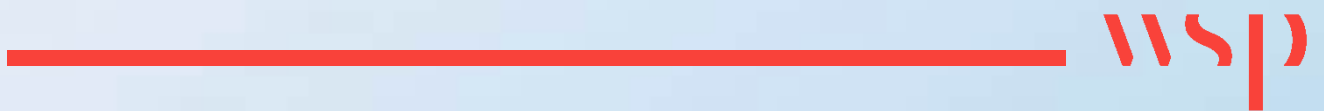
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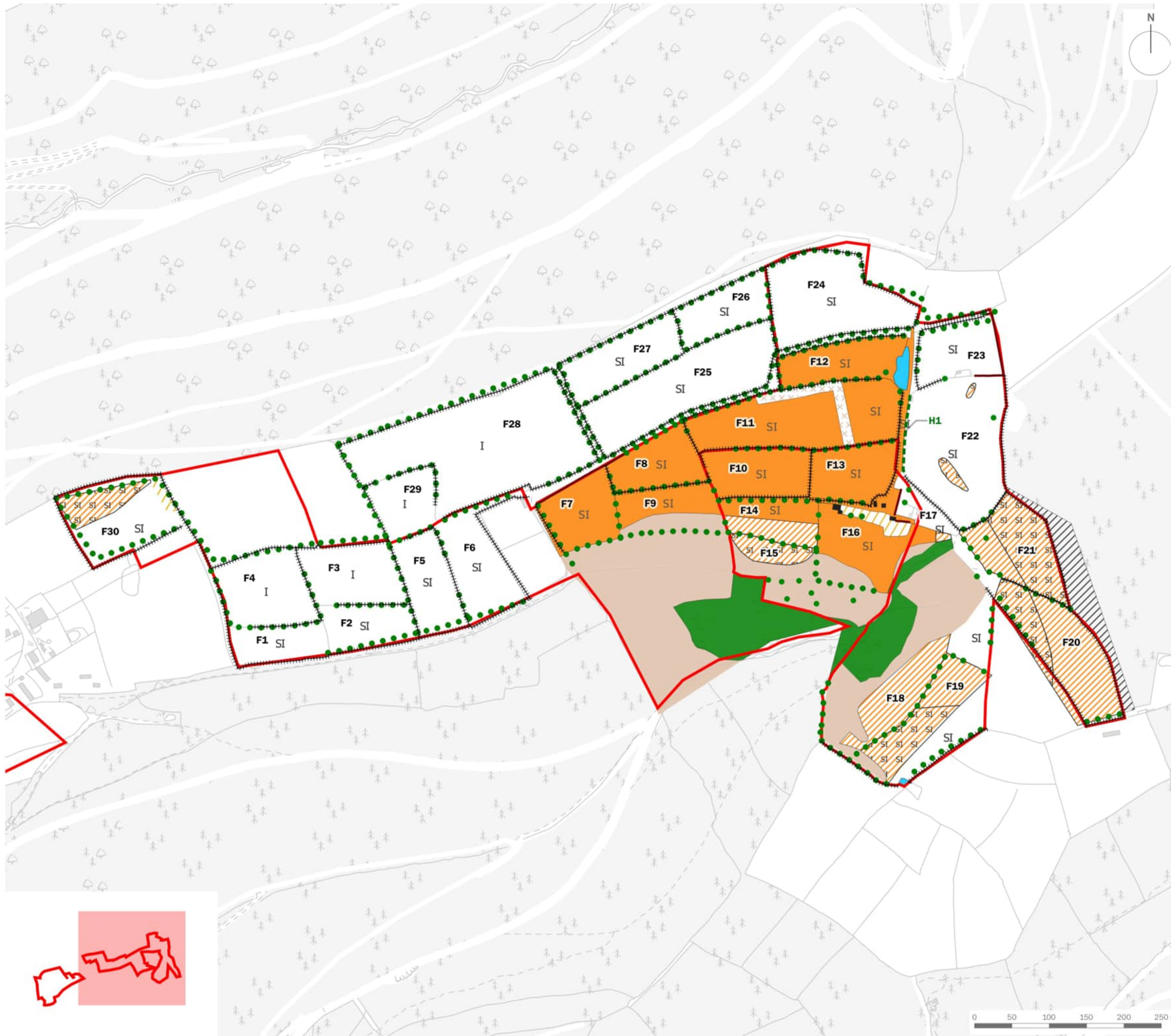









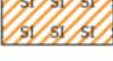

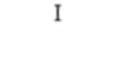








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Appendix D.2

PHASE 1 HABITAT PLAN





-  Site Boundary
-  Broadleaved Semi-natural Woodland
-  Coniferous Plantation Woodland
-  Tall Ruderal
-  Continuous Bracken
-  Scattered Bracken
-  Unimproved Acid Grassland
-  Semi-improved Acid Grassland
-  Semi-improved Neutral Grassland
-  Improved Grassland
-  Poor Semi-improved Grassland
-  Standing Water
-  Building
-  Scattered Trees
-  Defunct Species-poor Hedgerow
-  Wall
-  Fence
-  Scattered Trees (Broadleaved)

client
Pennant Walters

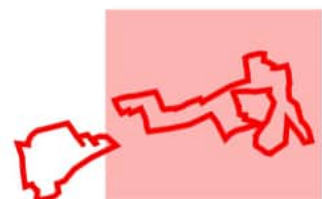
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drawing title
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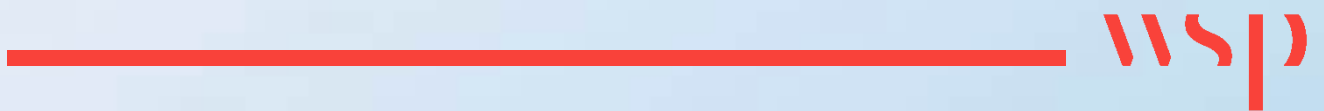


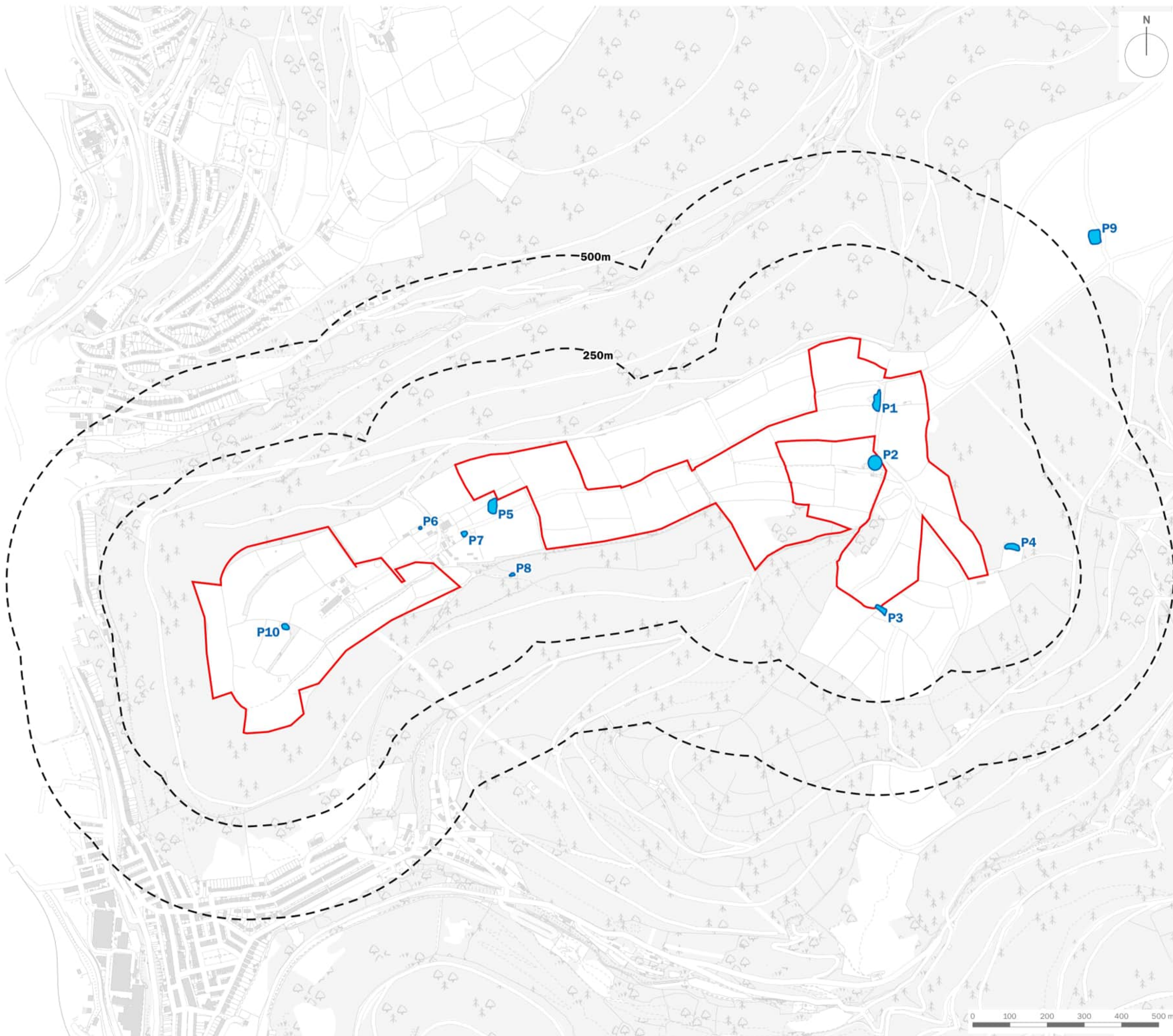
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Appendix D.3

POND LOCATIONS AND GCN





-  Site Boundary
-  Range Rings (at 250m intervals)
-  Pond
- P1** Pond Number

Presence/Absence Survey Results (eDNA), 2020:

- Great crested newt presence confirmed for P5;
- Great crested newt absence inferred for P1, P4 and P9;
- No survey possible in respect of P3 and P8 (dry) or P2, P6 and P7 (inaccessible);
- P10 not subject to survey.

Presence/Absence Survey Results (eDNA), 2021:

- Great crested newt presence confirmed for P4 and P5;
- Great crested newt absence inferred for P1 and P6;
- No survey possible in respect of P2, P3 and P8 (dry) or P7 (inaccessible);
- P9 and P10 not subject to survey.

Population Assessment Survey Results (P4 and P5), 2021:

- A small breeding population of great crested newt confirmed for P4;
- No evidence of great crested newt recorded for P5.

Presence/Absence Survey Results (eDNA), 2023:

- Great crested newt presence confirmed for P1 and P5;
- Great crested newt absence inferred for P4 and P6;
- No survey possible in respect of P2, P3 and P8 (dry) or P7 (inaccessible);
- P9 and P10 not subject to survey.

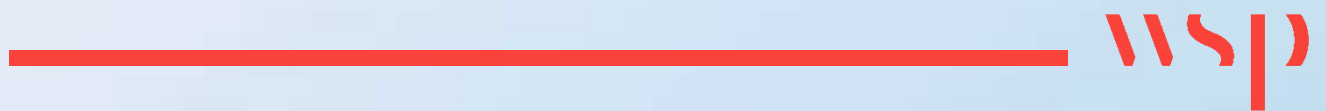
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project title	Rhyswg Wind Farm		
drawing title	Great Crested Newt Survey Results		
date	09 SEPTEMBER 2024	drawn by	MCa
drawing number	edp6611_d006b	checked	KHe
scale	1:10,000 @ A3	QA	GYo



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Appendix E

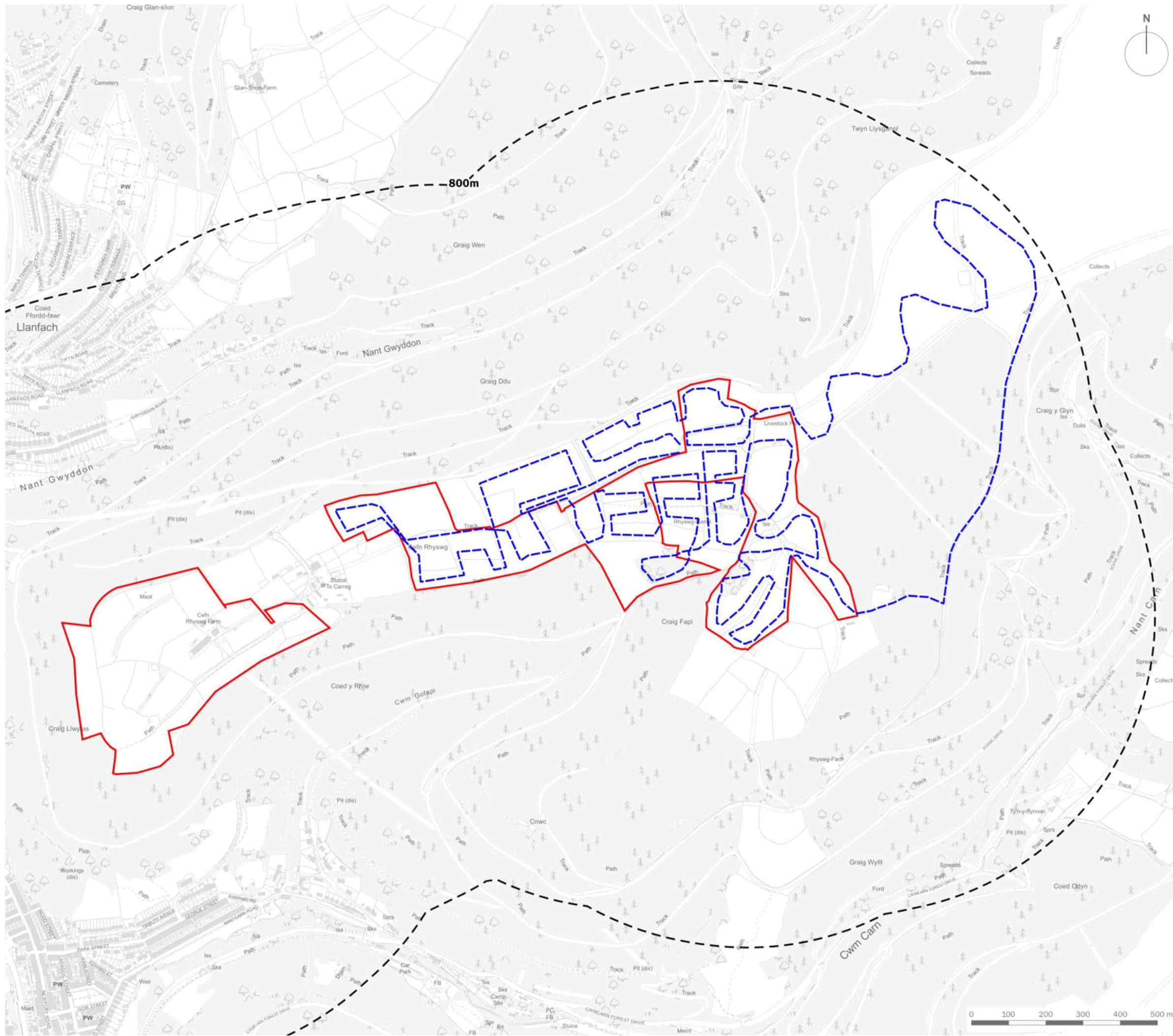
ORNITHOLOGY SURVEY


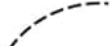



Appendix E.1

BREEDING AND WINTER BIRD TRANSECT ROUTE





-  Site Boundary
-  800m Range Ring
-  Breeding and Winter Bird Transect Route

client
Pennant Walters

project title
Rhyswg Wind Farm

drawing title
Breeding and Winter Bird Transect Route

date **09 SEPTEMBER 2024** drawn by **MCa**
drawing number **edp6611_d009a** checked **KHe**
scale **1:10,000 @ A3** QA **RBa**

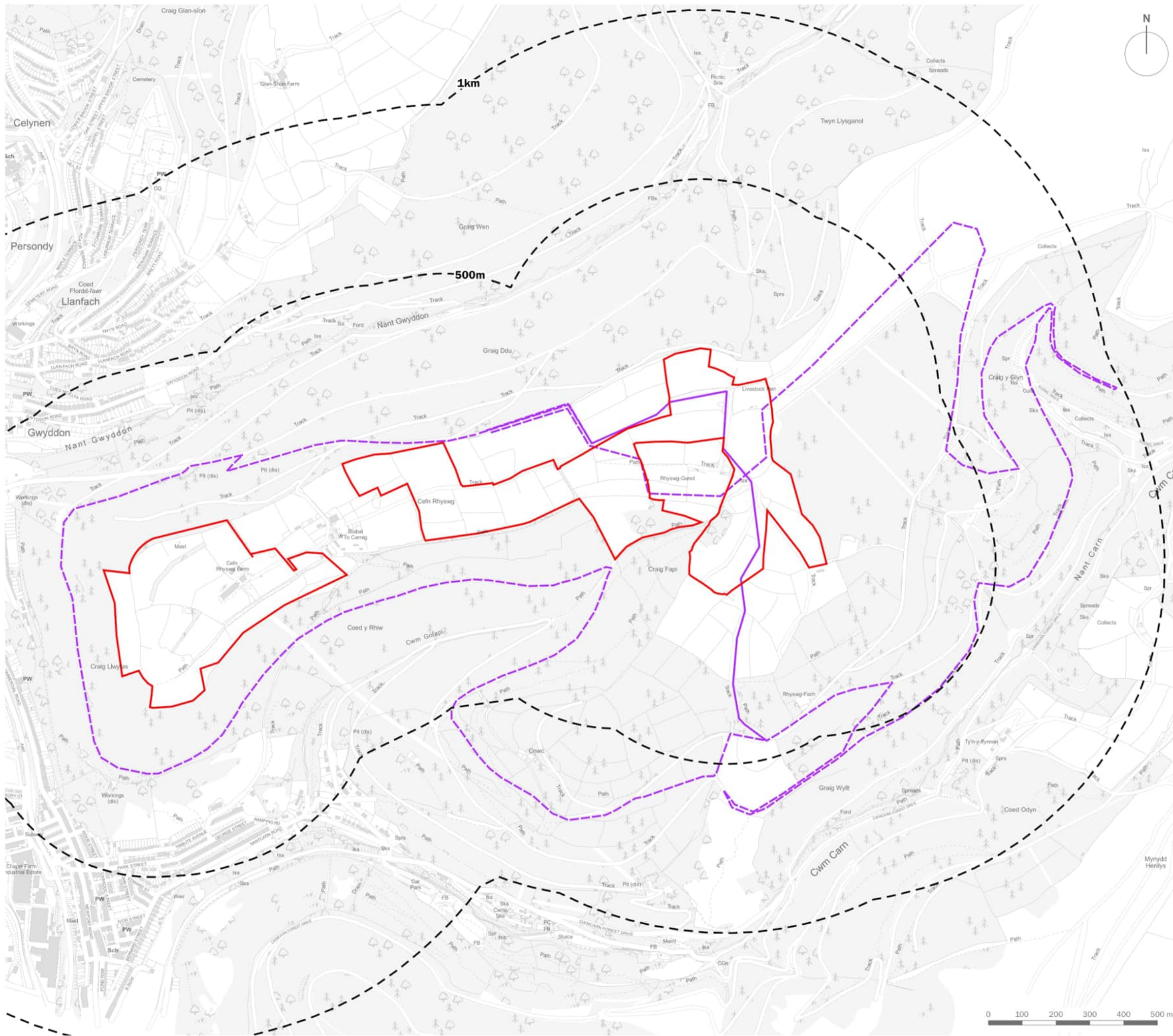


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Appendix E.2

NIGHTJAR/OWL SURVEY ROUTE





- Site Boundary
- Range Rings (at 500m intervals)
- Nightjar and Owl Survey Routes

client	Pennant Walters	
project title	Rhyswg Wind Farm	
drawing title	Nightjar and Owl Survey Routes	
date	09 SEPTEMBER 2024	drawn by MCa
drawing number	edp6611_d008a	checked KHe
scale	1:11,000 @ A3	QA RBa

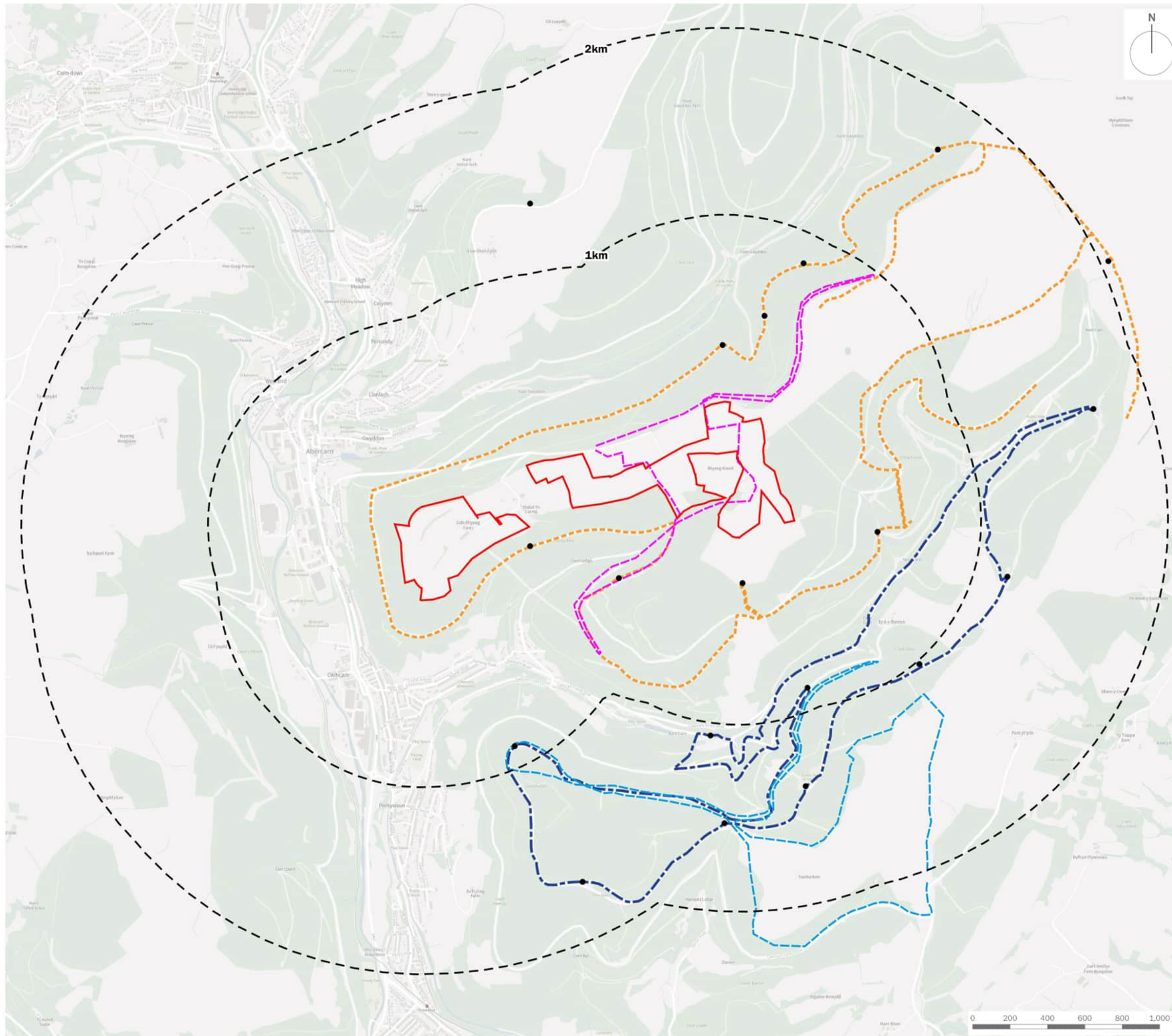


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Appendix E.3

RAPTOR SURVEY ROUTE





- Survey Boundary
- Range Rings (at 1km intervals)

Transect Routes 2024

- Walked Route
- Driving Route
- Vantage Point Location

Walked Transect Routes 2020/2021

- Northern Route
- Southern Route

Note: Raptor and other bird surveys were completed by EDP between 2020 and 2022 to inform Trcelyn Wind Farm that covers the northern extent of the search area and were therefore not repeated.

Walked routes illustrate the indicative core/main transect routes surveyed. Additional coverage was also provided through driven routes to potential nesting sites in the survey area, as identified through the preliminary investigations and using professional judgement.

client	Pennant Walters		
project title	Rhywng Wind Farm		
drawing title	Raptor Survey Routes		
date	09 SEPTEMBER 2024	drawn by	MCa
drawing number	edp6611_d007a	checked	KHe
scale	1:20,000 @ A3	QA	RBa

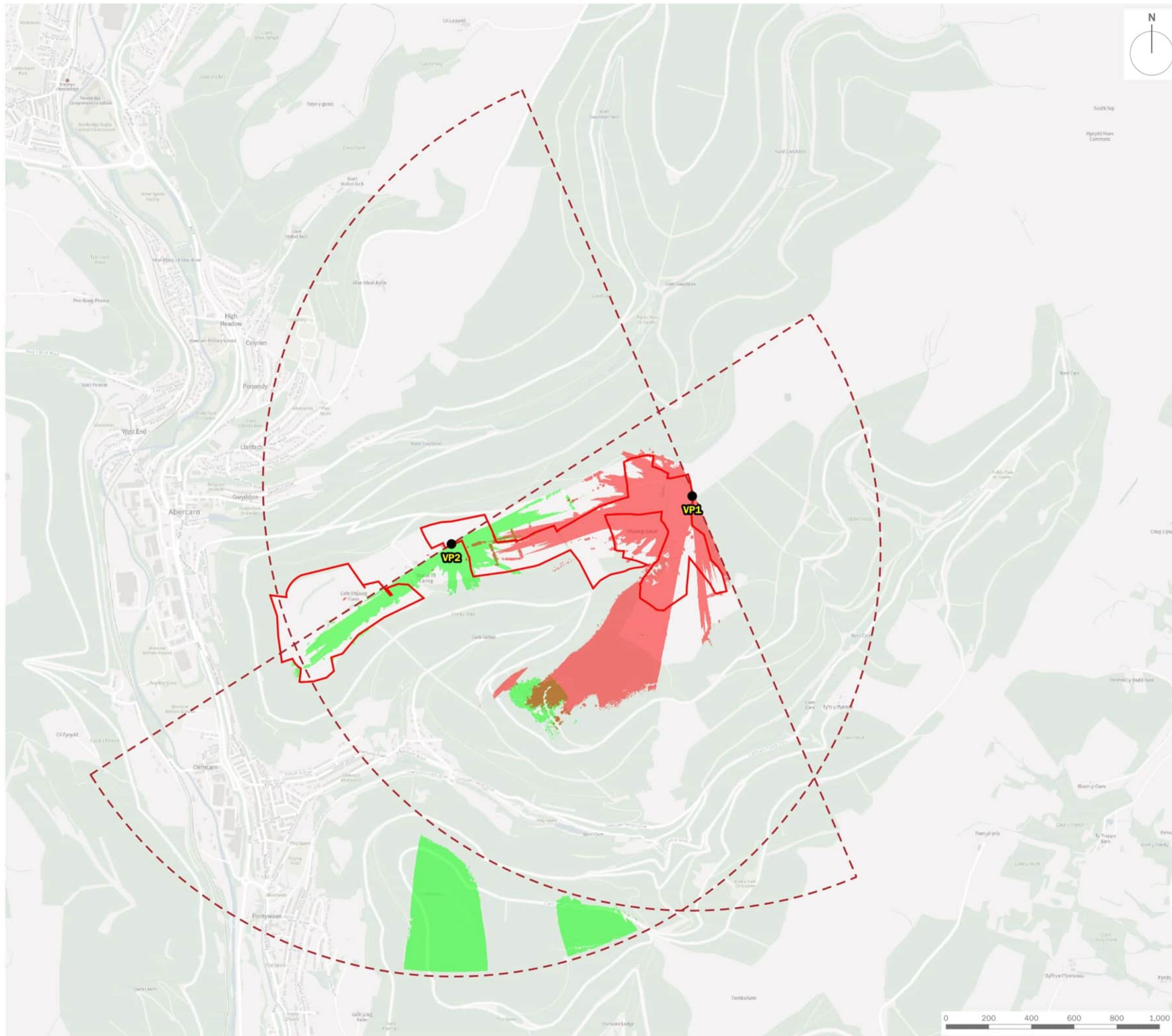


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Appendix E.4

VANTAGE POINT LOCATIONS AND ZTV





- Site Boundary
- Vantage Point Location
- Field of View at 2km Range
- Zone of Theoretical Visibility from Vantage Point 1
- Zone of Theoretical Visibility from Vantage Point 2

Zone of Theoretical Visibility (ZTV) was calculated using a spatial modelling algorithm which considers the following parameters:

- 1.75m Receptor Elevation (Observer Height)
- Visibility at 25m above ground
- 180 Degree Field of View
- LiDAR 1m Digital Surface Model (DSM) (vertical accuracy of +/- 5cm)

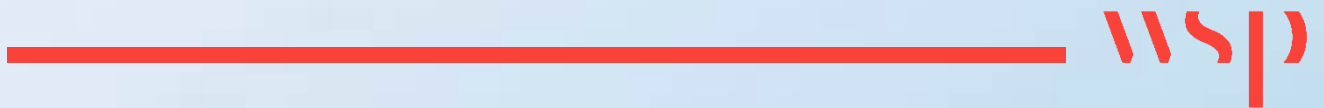
client	Pennant Walters		
project title	Rhyswg Wind Farm		
drawing title	Vantage Point Locations with Zones of Theoretical Visibility (ZTV)		
date	09 SEPTEMBER 2024	drawn by	MCa
drawing number	edp6611_d004a	checked	KHe
scale	1:17,500 @ A3	QA	RBa



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Appendix F

PEAT SURVEY FACTUAL REPORT



Technical note:

Trecelyn Wind Farm – Peat Depth Survey Report

1. Introduction

Wood Group UK Limited (Wood) were commissioned by Pennant Walters Limited to complete peat depth probing at the site of the proposed Trecelyn Wind Farm, located over four separate areas approximately 1.5 to 3.0km to the east of Newbridge in Caerphilly, as illustrated in **Figure 1**. The National Grid Reference (NGR) for the four site centres are recorded in Table 1.1.

Table 1. Site Area Locations

Area	Easting	Northing	Topography
1 (Northern Plot)	323240	198230	Set on an area of sloping ground on the western flanks of Mynydd Llwyd ranging from approximately 330m Above Ordnance Datum (AOD) in the west of the site and 410m AOD in the east.
2 (Central Plot – North)	323190	196920	Gently sloping ground at approximately 350m AOD.
3 (Central Plot – South)	323040	196320	The site is situated on gently sloping ground. Ground elevation ranges between 350m AOD in the east and 290m AOD in the west.
4 (Southern Plot)	323750	194780	The site is situated on gently sloping ground along Cefn Rhyswg. Ground elevation ranges between 390m AOD in the east and 350m AOD in the west.

1.1 Scope of Works

The design of the peat survey was developed in general accordance with the Guidance on Developments on Peatland¹.

The Phase 1 survey was undertaken on a 100m x 100m grid of points across the site with peat depth measurement taken at each survey point. This factual report details the findings of the survey works and illustrates the survey points on a peat spot depth plan (included as **Figure 2**).

1.2 Limitations

The peat depth survey was undertaken in accordance with best practice guidance to characterise peat depths across the site. It should be recognised that the survey provides information characterising the variation of peat depths and that different conditions may be present between survey locations.

¹ Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland, on-line version only.

Where utilities were identified a 50m exclusion zone was applied. Therefore, in some localised areas the grid spacing could not be fully adhered to. A Wales and West Utilities Engineer and BT engineer attended site with Wood's site manager to mark out the high-pressure gas main prior to any intrusive works.

2. Desk Study Information

2.1 Pedology

The Cranfield Soil and Agrifood Institute Soilscales map² indicates that the site is covered by freely draining acid loamy soils over rock.

2.2 Geology

The British Geological Survey Geoindex³ indicates no superficial deposits underlie the site.

The bedrock underlying the site is recorded as sandstone of the Hughes Member.

3. Survey Work

3.1 Methodology

The peat probing survey was undertaken in accordance with the locations and frequencies outlined in Section 1.1 and included the recording of the surveyed peat depths. The survey was undertaken using an extendable carbon fibre utility probe with lengths of probe carried to record depths of up to 8m below ground level (bgl). The probes are pushed into the ground by hand, until refusal on a hard stratum or obstruction.

The recorded depths were inputted into a personal digital assistant (PDA) with global position system (GPS) functionality to allow for a six figure NGR for each location.

The survey records the depth of any soft deposits (including peat) but is not exclusively related to peat depth and may include soft deposits that could also impact windfarm design and construction. No samples were obtained as part of this investigation.

3.2 Survey Findings

The Phase 1 peat depth survey was undertaken by Wood on the 16th September 2021 during a period of relatively dry weather. The survey comprised a total of 143 probes taken across the four site areas, revealing potential peat depths in the range of between 0.00m and 0.10m. The Welsh Government define true peat as being ≥ 0.4 m in depth. Therefore, the site can generally be considered as not being underlain by peat.

The peat survey data is enclosed in appendix A.

² Cranfield Soil and Agrifood Institute, Soilscales Map, <http://www.landis.org.uk/soilscales/>, accessed October 2021.

³ British Geological Survey Geoindex, <http://mapapps2.bgs.ac.uk/geoindex/home.html>, accessed October 2021.

4. Summary

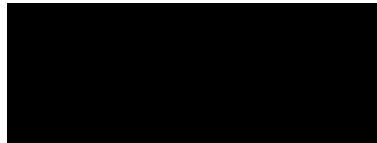
The survey indicated that the site is not underlain by peat with the peat probe refusing on hard stratum within the initial 0.1m bgl. The findings of the survey results are illustrated in Figure 2. The majority of the site is considered to be directly underlain by bedrock. However, this should be confirmed with an intrusive ground investigation. A Phase 2 peat survey is not considered necessary.

Prepared / Issued by



Rich Bagnall

Reviewed / Approved by



Ouarda Boumendjel-Game

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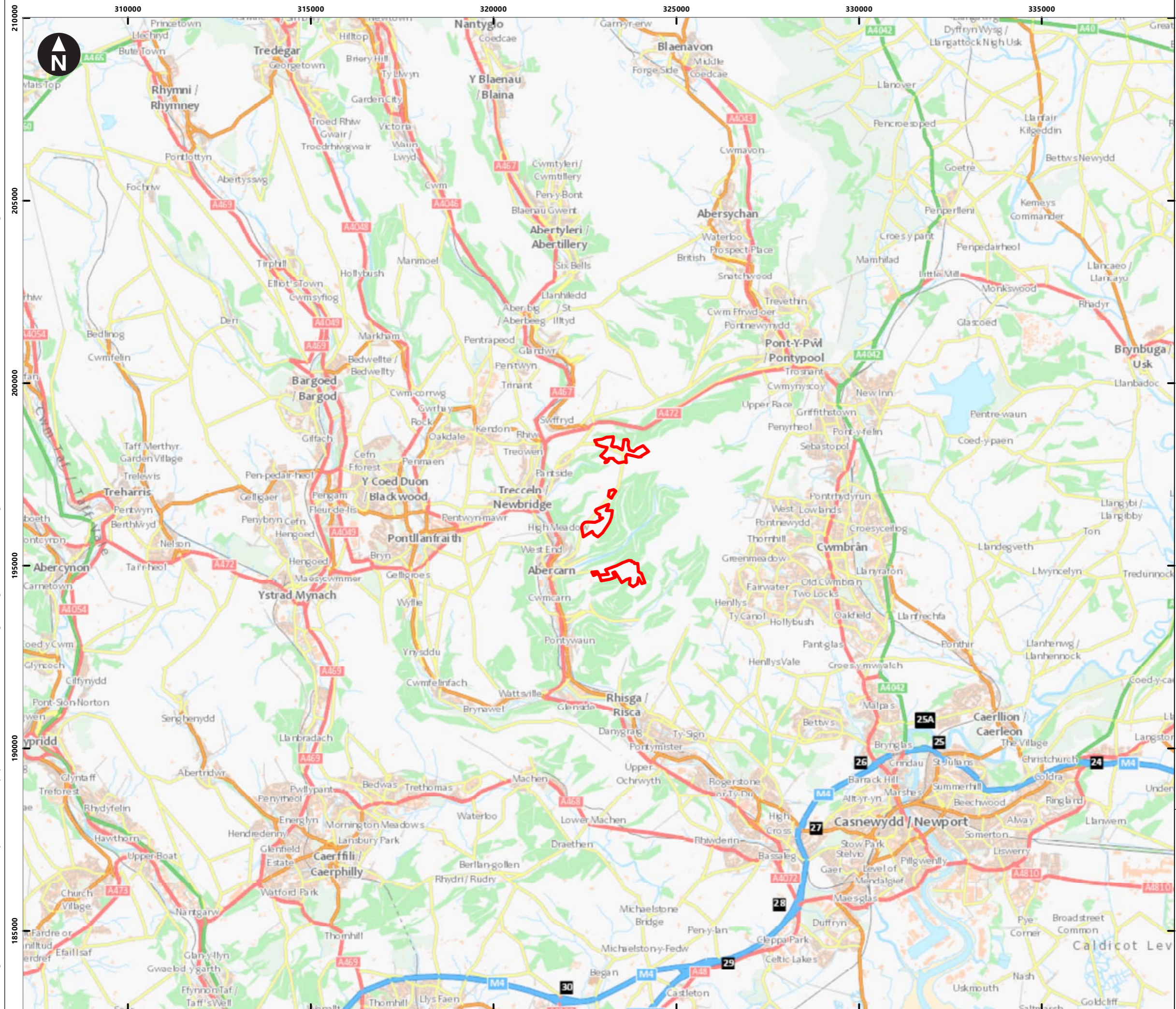
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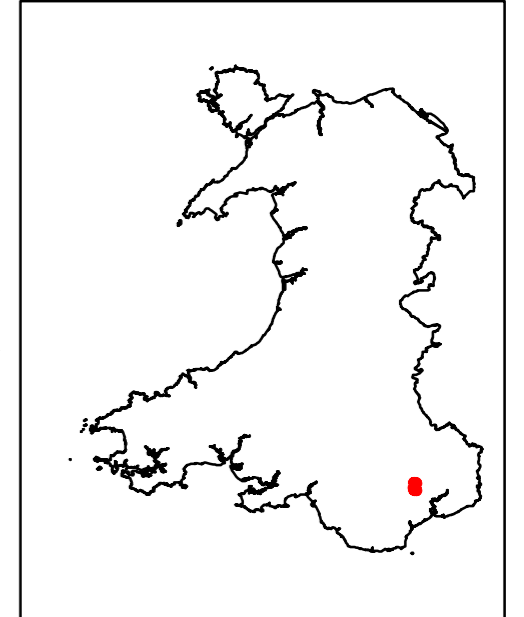
Figures



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Key
 Site Boundary



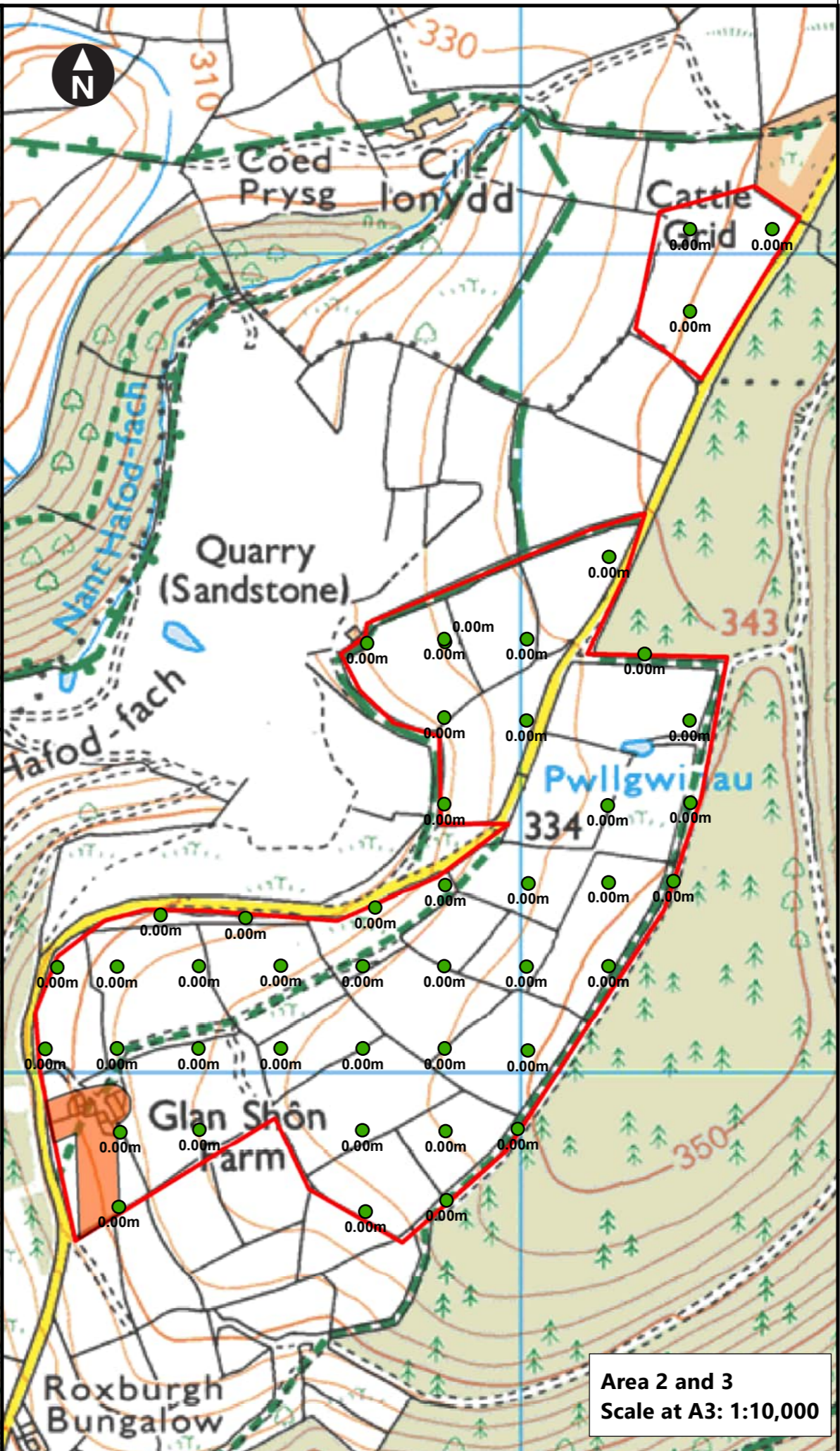
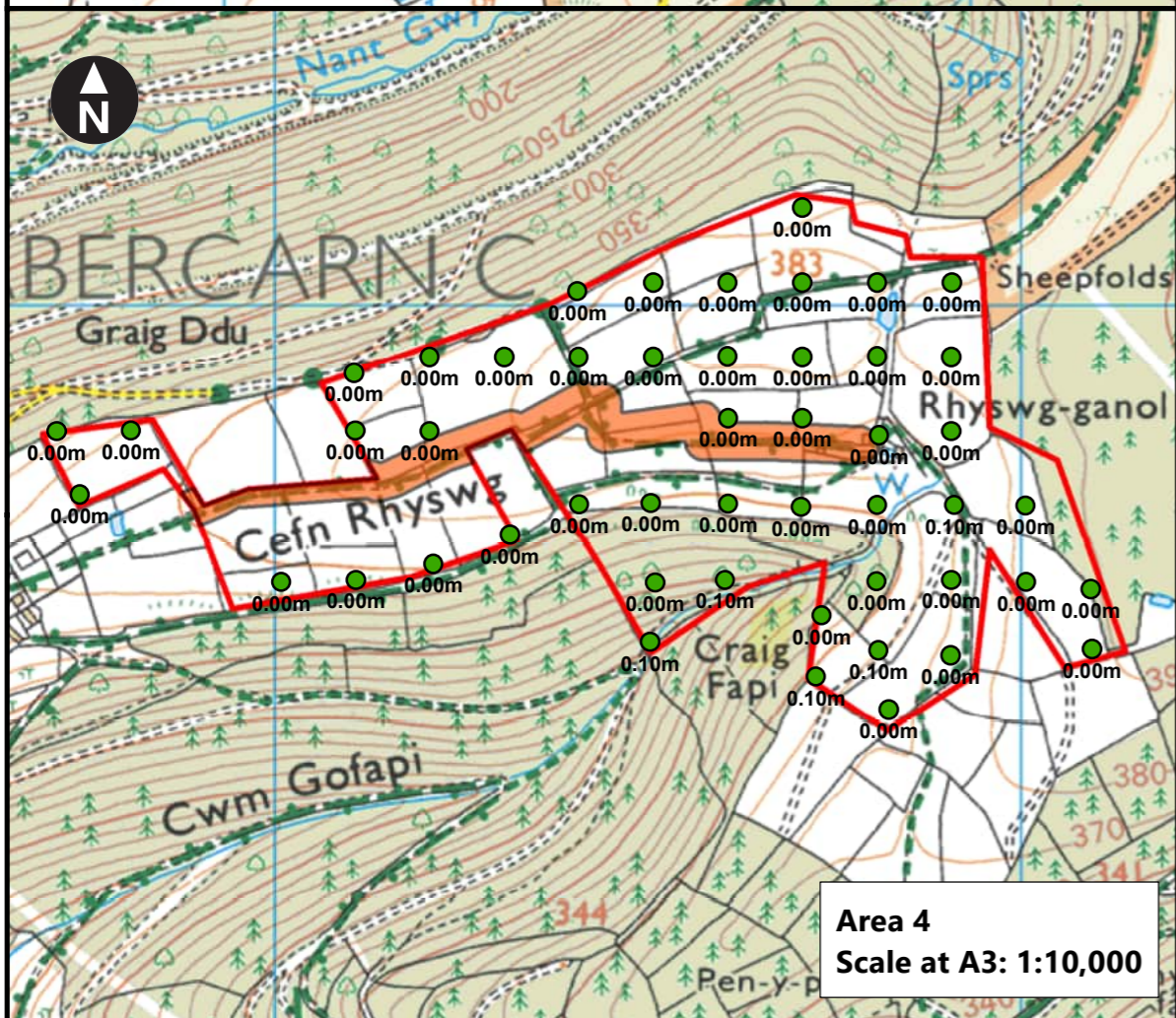
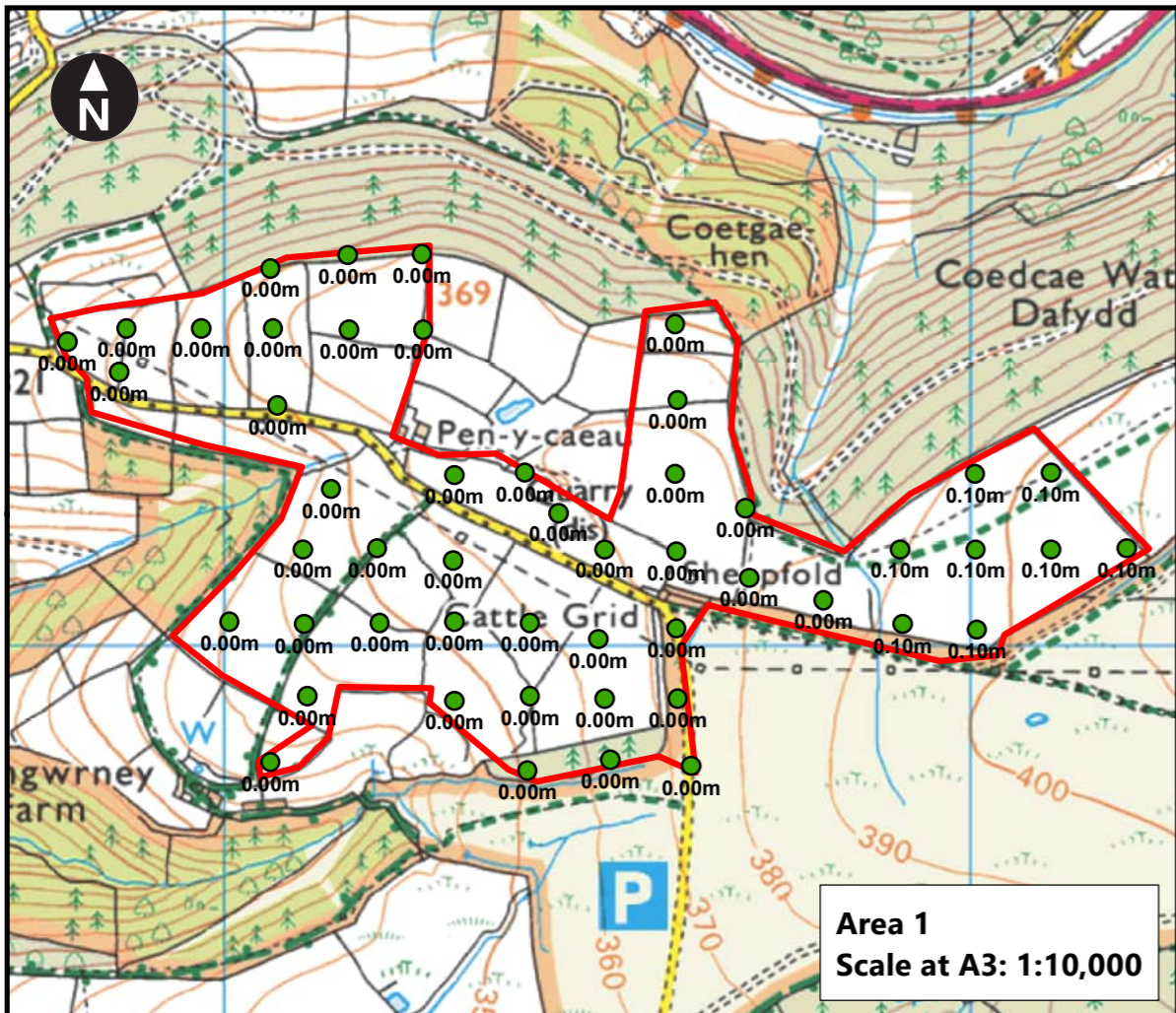
0 1.5 3 4.5 6 km
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Mynydd Maen Wind Farm
Phase 1 Peat Depth Survey Report

Figure 1.0
Site Location

October 2021 

\\sai-fs12.global.amec.com\shared\Projects\807379 Mynydd Maen Wind Farm\Deliver Stage\Design Technical\Drawings\GIS\MXD\201002-WOOD-XX-XX-FG-R-00001_S0_P01_1.mxd Originator: laura.morales



Key

- Site Boundary
- Survey Constraints
- Utilities
- Peat Depth (m)
 - 0.0 - 0.1

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Mynydd Maen Wind Farm
Phase 1 Peat Depth Survey Report

Figure 2
Phase 1 Peat Depth Results



Appendix A – Peat Probing Data



Appendix A
Mynydd Maen
Peat Depth Survey Results

Probe ID	Date	Peat Depth (m)	Easting	Northing
1	16/09/2021	0	322908	196526
2	16/09/2021	0	322813	196525
3	16/09/2021	0	322907	196434
4	16/09/2021	0	322907	196328
5	16/09/2021	0	323151	196511
6	16/09/2021	0	323207	196430
7	16/09/2021	0	323208	196330
8	16/09/2021	0	323106	196327
9	16/09/2021	0	323009	196231
10	16/09/2021	0	323107	196232
11	16/09/2021	0	323187	196234
12	16/09/2021	0	323107	196130
13	16/09/2021	0	323009	196027
14	16/09/2021	0	322997	195931
15	16/09/2021	0	322908	195929
16	16/09/2021	0	322910	195844
17	16/09/2021	0	322811	195830
18	16/09/2021	0	322608	195930
19	16/09/2021	0	322509	195836
20	16/09/2021	0	322511	195927
21	16/09/2021	0	322420	196029
22	16/09/2021	0	322435	196129
23	16/09/2021	0	322561	196193
24	16/09/2021	0	322664	196189
25	16/09/2021	0	323409	194731
26	16/09/2021	0	323315	194690
27	16/09/2021	0	323213	194652
28	16/09/2021	0	323109	194630
29	16/09/2021	0	323009	194627
30	16/09/2021	0.1	323503	194546
31	16/09/2021	0	323510	194626
32	16/09/2021	0.1	323604	194630
33	16/09/2021	0	323734	194582
34	16/09/2021	0.1	323726	194500
35	16/09/2021	0.1	323810	194536
36	16/09/2021	0	323823	194456
37	16/09/2021	0	323907	194529
38	16/09/2021	0	323907	194630
39	16/09/2021	0	323807	194627
40	16/09/2021	0	323504	194733
41	16/09/2021	0	323608	194732
42	16/09/2021	0	323706	194727
43	16/09/2021	0.1	323911	194731
44	16/09/2021	0	323808	194730
45	16/09/2021	0	323811	194824

Probe ID	Date	Peat Depth (m)	Easting	Northing
46	16/09/2021	0	323307	197030
47	16/09/2021	0	323207	197030
48	16/09/2021	0	323207	196930
49	16/09/2021	0	323108	196630
50	16/09/2021	0	323007	196530
51	16/09/2021	0	323007	196430
52	16/09/2021	0	322907	196530
53	16/09/2021	0	322908	196229
54	16/09/2021	0	323007	196130
55	16/09/2021	0	322907	196130
56	16/09/2021	0	322807	196130
57	16/09/2021	0	322907	196030
58	16/09/2021	0	322807	195929
59	16/09/2021	0	322807	196030
60	16/09/2021	0	322707	196030
61	16/09/2021	0	322607	196030
62	16/09/2021	0	322607	196130
63	16/09/2021	0	322707	196130
64	16/09/2021	0	322507	196129
65	16/09/2021	0	322507	196029
66	16/09/2021	0	323106	194908
67	16/09/2021	0	323108	194830
68	16/09/2021	0	322738	194745
69	16/09/2021	0	322707	194830
70	16/09/2021	0	322807	194830
71	16/09/2021	0	323208	194930
72	16/09/2021	0	323207	194830
73	16/09/2021	0	323307	194930
74	16/09/2021	0	323406	195017
75	16/09/2021	0	323407	194930
76	16/09/2021	0	323507	195029
77	16/09/2021	0	323508	194929
78	16/09/2021	0	323607	195030
79	16/09/2021	0	323707	195130
80	16/09/2021	0	323707	195030
81	16/09/2021	0	322823	196201
82	16/09/2021	0	323808	195029
83	16/09/2021	0	323908	195029
84	16/09/2021	0	323907	194930
85	16/09/2021	0	324096	194537
86	16/09/2021	0	324095	194618
87	16/09/2021	0	324008	194627
88	16/09/2021	0	324007	194729
89	16/09/2021	0	323907	194829
90	16/09/2021	0	323808	194930
91	16/09/2021	0	323608	194847
92	16/09/2021	0	323707	194847
93	16/09/2021	0	323607	194930
94	16/09/2021	0	323707	194929

Probe ID	Date	Peat Depth (m)	Easting	Northing
95	16/09/2021	0.1	324210	198130
96	16/09/2021	0.1	324109	198231
97	16/09/2021	0.1	324109	198128
98	16/09/2021	0.1	324007	198230
99	16/09/2021	0.1	324009	198128
100	16/09/2021	0.1	324010	198020
101	16/09/2021	0.1	323907	198128
102	16/09/2021	0.1	323910	198028
103	16/09/2021	0	323804	198060
104	16/09/2021	0	323704	198090
105	16/09/2021	0	323699	198184
106	16/09/2021	0	323605	198431
107	16/09/2021	0	323609	198328
108	16/09/2021	0	323605	198230
109	16/09/2021	0	323607	198125
110	16/09/2021	0	323510	198128
111	16/09/2021	0	323448	198177
112	16/09/2021	0	323404	198231
113	16/09/2021	0	323308	198228
114	16/09/2021	0	323266	198525
115	16/09/2021	0	323267	198423
116	16/09/2021	0	323167	198423
117	16/09/2021	0	323166	198523
118	16/09/2021	0	323062	198506
119	16/09/2021	0	323066	198425
120	16/09/2021	0	323072	198322
121	16/09/2021	0	322969	198425
122	16/09/2021	0	322869	198425
123	16/09/2021	0	322789	198407
124	16/09/2021	0	322859	198366
125	16/09/2021	0	323143	198209
126	16/09/2021	0	323105	198128
127	16/09/2021	0	323007	198031
128	16/09/2021	0	323107	198028
129	16/09/2021	0	323205	198130
130	16/09/2021	0	323307	198114
131	16/09/2021	0	323208	198030
132	16/09/2021	0	323112	197931
133	16/09/2021	0	323062	197842
134	16/09/2021	0	323308	198031
135	16/09/2021	0	323308	197925
136	16/09/2021	0	323410	198030
137	16/09/2021	0	323410	197931
138	16/09/2021	0	323407	197831
139	16/09/2021	0	323518	197845
140	16/09/2021	0	323510	197928
141	16/09/2021	0	323502	198007
142	16/09/2021	0	323607	198022
143	16/09/2021	0	323609	197928

Probe ID	Date	Peat Depth (m)	Easting	Northing
144	16/09/2021	0	323626	197838



Canon Court West
Abbey Lawn
Shrewsbury
SY2 5DE

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