

3. Proposed Development

3.1 Introduction

- 3.1.1 This chapter describes the Proposed Development known as Fferm Wynt Nant y Maen Wind Farm, a wind energy project located in Ceredigion, Wales. The description is provided to support a request for a Scoping Direction under the Significant Infrastructure Projects (SIP) regime established by the Infrastructure (Wales) Act 2024 (Senedd Cymru, 2024), for which Infrastructure Consent (in the form of an Infrastructure Consent Order) will be sought from the Welsh Ministers. The Environmental Impact Assessment will be undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended) (Welsh Government, 2017).
- 3.1.2 The purpose of this chapter is to present sufficient information to enable consultees to understand the nature and scale of the Proposed Development and to identify the likely significant environmental effects to be assessed within the Environmental Statement. The description reflects the current stage of design development and has been prepared to be proportionate for scoping, identifying those elements of the Proposed Development that will be assessed within the EIA and clarifying where specific elements fall outside the scope of the Infrastructure Consent application.
- 3.1.3 The Proposed Development will be defined using a Rochdale Envelope approach, with environmental effects assessed against clearly defined realistic worst-case parameters. The assessment will identify, for each environmental topic, the specific parameters that represent the realistic worst case for effects (including turbine tip height, rotor diameter, turbine number and layout flexibility, access track width and extent, and indicative construction programme assumptions) and will demonstrate how the final design will remain within the assessed envelope for the purposes of Infrastructure Consent (Planning Inspectorate , 2018).

3.2 Consent Context and Application Strategy

- 3.2.1 The Proposed Development comprises an onshore wind generating station with an installed capacity of up to 150 MW.
- 3.2.2 Consent will be sought from the Welsh Ministers, with the application administered by Planning and Environment Decisions Wales (PEDW). The Proposed Development lies within the administrative area of Ceredigion County Council, which will act as a statutory consultee, including in relation to highways and local planning matters. The Applicant will continue to engage with statutory consultees throughout pre-application, including Natural Resources Wales, Cadw and relevant aviation and telecommunications stakeholders, to agree the scope and approach to the EIA and topic-specific assessment methodologies.

- 3.2.3 The application will be made as a single application for an Infrastructure Consent Order (ICO) under the Infrastructure (Wales) Act 2024 (Senedd Cymru, 2024), comprising a wind generating station qualifying (the 'Proposed Development') as a Significant Infrastructure Project, together with associated development and ancillary works. The Proposed Development will include the principal generating station and ancillary infrastructure required for its construction, operation, maintenance and decommissioning. This is anticipated to include relevant access works, on-site tracks, crane hardstandings, temporary construction compounds, electrical infrastructure, drainage features, on-site borrow pits (where required), habitat management and enhancement measures, and other ancillary works.
- 3.2.4 A Battery Energy Storage System (BESS) forms part of the Proposed Development; the location will be determined through the iterative design process.
- 3.2.5 The detailed Order Limits for the Proposed Development, which may comprise more than one discrete area of land and include both permanent and temporary works, are currently being refined and will be confirmed at application stage. Any works outside the Order Limits, including off-site highway works (if applicable) will be clearly identified and the relevant consenting route set out within this Scoping Report.
- 3.2.6 The Proposed Development has a connection agreement with the National Energy System Operator (NESO). The export cable and point of connection substation are not proposed to form part of the Infrastructure Consent Order application, as the connection infrastructure is subject to separate consents by the relevant electricity undertaker.
- 3.2.7 The scope of this application does not rely on the delivery of such infrastructure. Where relevant, the EIA will consider the potential for cumulative effects arising from other consented and reasonably foreseeable infrastructure projects in the surrounding area, including electricity network infrastructure promoted by third parties.
- 3.2.8 The powers proposed in the Order will be identified as the Proposed Development progresses. At this stage, these may include (where applicable) water environment permits and approvals for works affecting ordinary watercourses, protected species licences, and permissions relating to forestry felling and habitat management. The EIA will assess the likely significant environmental effects of the Proposed Development on the basis that such regulatory requirements and good practice measures will be secured and complied with.

3.3 Site Location and Context

- 3.3.1 The location, extent and environmental context of the Proposed Development are described in detail within Chapter 2: Site Location and Description of this Scoping Report. In summary, the Proposed Development is located within an upland landscape with areas of hydrological and peat sensitivity and a rural settlement context, and these constraints have informed the evolving layout and will inform the scope of the EIA.

- 3.3.2 That chapter sets out the site's geographical location, land use, surrounding landscape character, settlement context and relevant environmental designations. This Proposed Development chapter focuses on the nature and components of the Proposed Development, in order to avoid unnecessary repetition across chapters.

3.4 Description of the Proposed Development

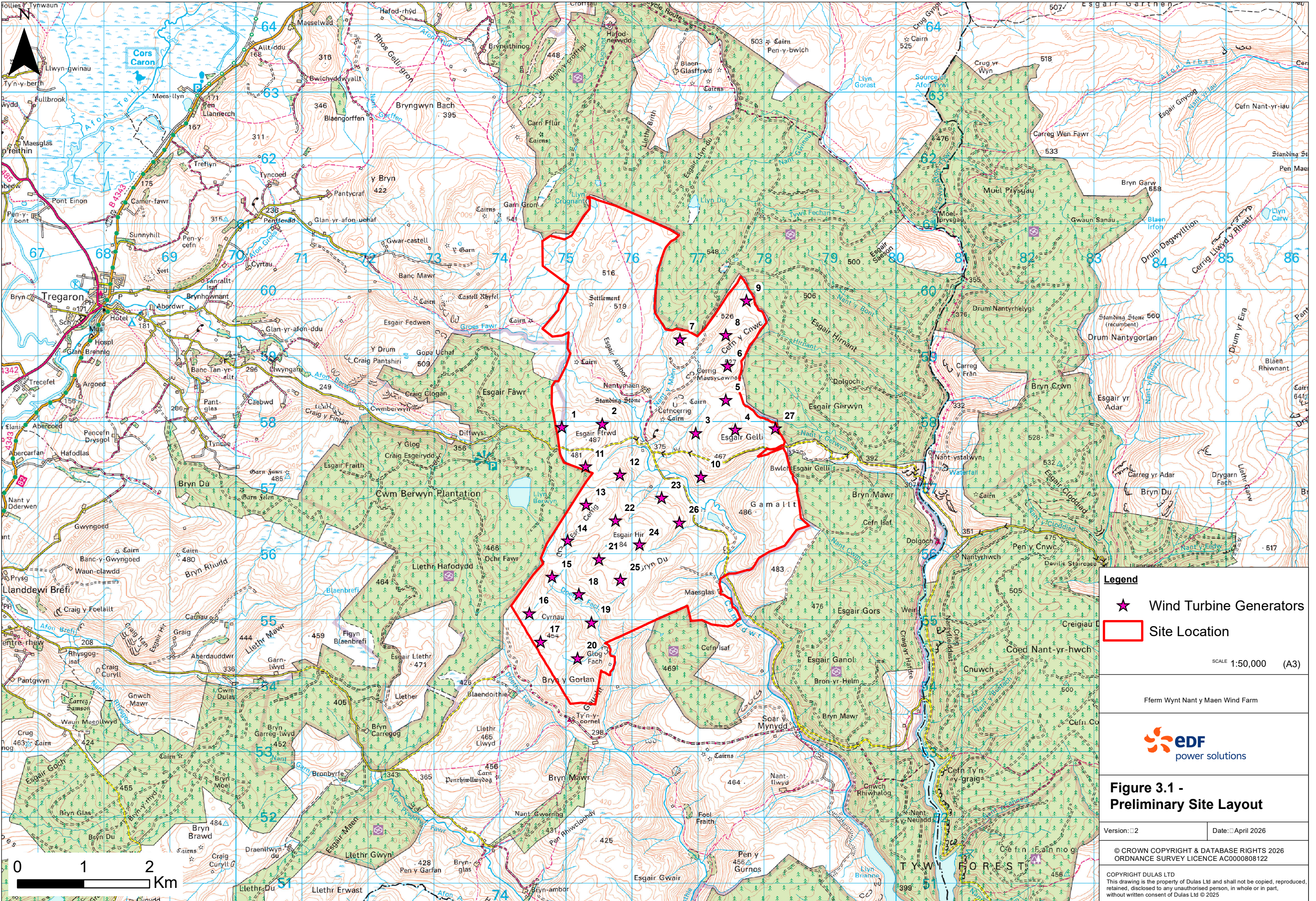
Wind Turbines (Rochdale Envelope)

- 3.4.1 The Proposed Development will comprise up to 27 wind turbines, assessed within the parameters set out in Table 3.1. The Preliminary Site Layout (Figure 3.1) is indicative at this scoping stage and will be refined through iterative design, informed by consultation and environmental and technical constraints. The EIA will apply the parameters in Table 3.1 to define realistic worst case scenarios for each topic, including the preparation of ZTVs and viewpoint assessment for landscape and visual effects, and worst case inputs for noise and shadow flicker assessment.
- 3.4.2 Micrositing will be proposed for turbines and other on-site infrastructure, including access tracks where localised adjustments may be required to accommodate turbine delivery and installation, with any permitted deviation from consented locations defined on an element-specific basis and informed by design requirements and site-specific environmental and technical sensitivities.

Table 3.1 - Wind Turbine Parameters (Maximum Assessed)

Parameter	Maximum
Number of turbines	Up to 27
Maximum hub height	149 m
Maximum rotor diameter	163 m
Maximum blade tip height	230 m

- 3.4.3 In addition to the maximum turbine parameters presented in Table 3.1, the Rochdale Envelope for the Proposed Development will also define: (i) the maximum turbine number to be assessed; (ii) the maximum micro-siting tolerance for turbine locations, which could be justified as different in each location; and (iii) indicative minimum turbine spacing assumptions used to inform layout development and topic assessments. A worst case scenario within those parameters will be used for all assessments.
- 3.4.4 Each turbine will be supported by a reinforced concrete foundation with an associated crane hardstanding. Foundation dimensions and design will vary subject to turbine specification and ground conditions; for assessment purposes the EIA will adopt realistic



Legend

- ★ Wind Turbine Generators
- Site Location

SCALE 1:50,000 (A3)

Fferm Wynt Nant y Maen Wind Farm



Figure 3.1 - Preliminary Site Layout

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worst-case assumptions for foundation footprint and excavation depth, crane hardstanding area and associated temporary working areas. These assumptions will inform the assessment of ground conditions, peat disturbance, hydrology and hydrogeology, and construction traffic associated with concrete deliveries.

Associated and Ancillary Development

- 3.4.5 A range of ancillary infrastructure and, where applicable, associated development may be required to enable the construction, operation, maintenance and decommissioning of the Proposed Development. At this stage, these elements are described at a high level and remain subject to refinement; however, the key associated development likely to influence environmental effects includes site access works, internal access tracks, turning areas, passing areas, electrical cabling and cable trenches, an on-site substation(s) and control building, Battery Energy Storage System (BESS), temporary construction compounds, storage / laydown areas, drainage features and watercourse crossings or diversions, borrow pits (where required) and ecological / environmental enhancements and mitigations.
- 3.4.6 Associated and ancillary development may include the temporary and permanent works required to construct, operate and maintain the Proposed Development.

Construction Phase Infrastructure

- 3.4.7 Construction Phase Infrastructure may include (in addition to the above): temporary laydown areas at turbine locations; Abnormal Indivisible Load (AIL) route options, temporary construction drainage and silt management measures; temporary fuel storage and refuelling areas; and temporary wheel washing facilities, all to be designed and operated in accordance with agreed pollution prevention and water protection measures.
- 3.4.8 Where borrow pits are proposed, the EIA will define the realistic worst case number, extent and depth of borrow pits within the site and will assess associated effects on landscape, geology, peat, hydrology and hydrogeology. Borrow pit location and design will be informed by ground investigation and environmental constraints and will include a defined restoration strategy and reinstatement to an agreed landform and habitat specification.

Operational Phase Infrastructure

- 3.4.9 Operational Phase Infrastructure may include an on-site substation and associated control building. For assessment purposes, the EIA will adopt realistic worst case assumptions for the substation compound area, control building height, external electrical plant and security fencing, and will assess associated landscape and visual effects, operational noise (where relevant), drainage and biodiversity effects.
- 3.4.10 The operational phase of the Proposed Development would comprise a range of permanent infrastructure elements required for electricity generation, control, monitoring, access and site security, which may include the following components:
- On site substation, including control building, switchgear and transformers;

- Battery Energy Storage System (BESS), which forms part of the Proposed Development; the location will be determined through the iterative design process.
- Electrical cabling between turbines (Overground / Underground);
- Fibre optic communications infrastructure;
- Permanent access tracks and maintenance parking areas;
- Permanent security fencing, CCTV and signage;
- Permanent Meteorological Mast; and
- Fire suppression and emergency backup systems where required.

Access and Transport Infrastructure

3.4.11 Access and Transport Infrastructure for the construction and operational phases may include new and upgraded site access works and internal access tracks. The EIA will assess realistic worst case assumptions for access track width and construction method (including cut-and-fill and floating road construction where required), the extent of passing places and turning heads, and any bridge upgrades or highway improvements required to facilitate abnormal loads. The Proposed Development would incorporate permanent and temporary access and transport infrastructure to support construction, site access and ongoing operational requirements, which may include the following:

- New permanent site access(es) from the public highway;
- Localised widening or improvement of existing roads;
- New internal access tracks;
- Bridge upgrades and passing bays; and
- Temporary construction access points.

Drainage and Water Management

3.4.12 Drainage and Water Management measures will be developed to protect the water environment during construction and operation. The EIA will describe and assess realistic worst case assumptions for construction drainage and silt management, permanent drainage and attenuation features (including SuDS where applicable), and the number and type of watercourse crossings. Watercourse crossings will be designed to maintain hydromorphology and fish passage where relevant, and to minimise in-channel works.

3.4.13 Accordingly, the Proposed Development may include the following drainage and water management infrastructure components to support construction and operational requirements:

- Permanent site drainage systems;
- Attenuation features and Sustainable Drainage Systems (SuDS); and

- Culverts and watercourse crossings or diversions.

Environmental Mitigation and Enhancement

- 3.4.14 The Proposed Development will incorporate embedded mitigation and opportunities for habitat enhancement. A Net Benefit for Biodiversity target will be defined and evidenced using an agreed biodiversity metric, with the baseline and proposed interventions described and assessed within Chapter 6 (Ecology and Biodiversity). Delivery and long-term management measures will be set out within an outline Habitat Management Plan, to be refined through consultation and secured through the Infrastructure Consent Order as appropriate.
- 3.4.15 In this context, the environmental mitigation and enhancement measures associated with the Proposed Development may include the following embedded measures and outcomes:
- Net Benefit for Biodiversity

Grid Connection – Assessment Scope and Cumulative Considerations

- 3.4.16 The grid connection required to export electricity from the Proposed Development will be delivered by the relevant network operator and does not form part of the development to be authorised by the Infrastructure Consent Order. Accordingly, grid connection infrastructure beyond the Order Limits is excluded from the Proposed Development and will be promoted and consented as a separate project through the appropriate statutory processes.
- 3.4.17 Grid connection infrastructure beyond the Order Limits does not form part of the Proposed Development to be authorised by the Infrastructure Consent Order and will be promoted as a separate project by the relevant network operator. The Proposed Development does include on-site electrical infrastructure within the Order Limits (including the on-site substation(s) and internal cabling). The EIA will consider the potential for cumulative and combined effects with a reasonable worst case grid connection route corridor where sufficient information is available, to support proportionate scoping and to inform cumulative assessment.
- 3.4.18 There is a grid connection offer and the EIA will identify and assess, on a proportionate basis, the potential implications of these voltage options where relevant to cumulative and combined effects (for example, where the voltage affects the likely type of network infrastructure and associated corridor requirements).
- 3.4.19 The location and configuration of any grid connection substation(s) and associated off-site infrastructure have not yet been confirmed and are subject to separate strategic network planning processes led by the relevant network operator. The Proposed Development will be assessed on a stand-alone basis for the purposes of the Infrastructure Consent application. Notwithstanding this, the EIA will identify, so far as reasonably practicable at scoping stage, the potential for cumulative and combined effects associated with a

reasonable worst case grid connection route corridor and related network infrastructure options, and will set out any assumptions and limitations clearly.

- 3.4.20 Where limited information is available at the time of assessment a high-level overview of the environmental and technical constraints along a reasonable likely grid connection route corridor will be included as an appendix to the ES. Where a grid connection project or elements of it are in the public domain and sufficient detail is available, a more detailed assessment of the potential cumulative and combined effects of the turbines and grid connection will be assessed on a proportionate basis, with any assumptions and limitations clearly stated.
- 3.4.21 The assessment will define a reasonable likely grid route corridor for the purposes of cumulative and combined effects assessment and will identify the key environmental and technical constraints that would influence routeing, construction and operation.
- 3.4.22 The assessment scope will be aligned with the relevant topic chapters of this Scoping Report, including Chapter 5 (Landscape and Visual Impact Assessment), Chapter 6 (Ecology and Biodiversity), Chapter 7 (Ornithology), Chapter 9 (Archaeology and Cultural Heritage), Chapter 10 (Hydrology, Hydrogeology and Flood Risk), Chapter 11 (Transport and Access), Chapter 12 (Telecommunications and Aviation), Chapter 14 (Socio-economics) and Chapter 19 (Cumulative Effects). Chapters 13 (Shadow Flicker), 15 (Air Quality), 16 (Climate Change), 17 (Human Population and Health) and 18 (Accidents and Disasters) are intended to be scoped out.

3.5 Construction Phase Description

- 3.5.1 Construction of the Proposed Development is anticipated to take approximately 24 months, subject to final design and programming. Construction working hours and any requirement for out-of-hours working (for example, during abnormal load deliveries or specific construction activities) will be defined within the construction strategy and will be assessed within the EIA. The construction programme will also take account of seasonal environmental constraints where relevant (for example, breeding bird seasons and periods of higher hydrological sensitivity).
- 3.5.2 Indicative construction phases include: pre-construction surveys and enabling works (including vegetation clearance, and pre-construction environmental protection measures); site access and works to enable AIL access and internal track construction; ground improvement and earthworks (including borrow pit development where required); establishment of compounds; welfare areas; turbine foundation excavation and construction; electrical cabling, cable trenching and substation works; watercourse crossings and drainage installation; turbine component delivery and erection; commissioning and testing; and reinstatement, restoration and habitat management.
- 3.5.3 Peak construction workforce numbers are anticipated to be in the order of 200–350 personnel, varying by construction phase. The construction strategy will identify the

approach to worker accommodation and welfare (including whether any temporary on-site accommodation is proposed or whether the workforce will be accommodated within the local and regional area), and the EIA will assess any associated traffic ; including Heavy Good Vehicles (HGV's) abnormal loads and abnormal indivisible load movements associated with deliveries, socio-economic and population and human health effects.

- 3.5.4 Earthworks volumes for the wind farm infrastructure are currently estimated to be in the range of approximately 130,000–300,000 m³ across the site and will be refined as the layout and ground conditions are confirmed. The EIA will describe the material balance assumptions, including the proposed approach to peat excavation, storage, re-use and restoration where peat is present. Controlled blasting may be required at some turbine locations subject to ground conditions and further investigation; where blasting is proposed, the EIA will assess potential effects (including noise and vibration) with reference to identified receptors and will identify the control measures and monitoring approach that would be applied.
- 3.5.5 Concrete supply arrangements will be confirmed at detailed design stage and may include on site or off site batching, depending on logistics and environmental considerations. For assessment purposes, the EIA will identify a realistic worst case concrete supply scenario and will assess associated construction traffic and transport effects, potential nuisance effects (noise, dust) and pollution risks to the water environment, with embedded mitigation measures defined within the construction environmental management approach.

3.6 Operational Phase Description

- 3.6.1 The operational lifespan of the Proposed Development is anticipated to be up to 35 years. This operational period forms the basis for the EIA assumptions for operation and maintenance, with decommissioning addressed in Section 3.7.
- 3.6.2 During operation, turbine maintenance is expected to involve routine scheduled visits together with reactive maintenance as required. Operational traffic levels are anticipated to be low and intermittent, associated primarily with maintenance activities and habitat management; for assessment purposes, the EIA will describe an indicative annual range of light vehicle and HGV visits associated with routine maintenance. Infrequent abnormal maintenance activities (such as major component replacement requiring specialist vehicles and cranes) will also be described on a realistic worst case basis, to inform assessment of any temporary transport and nuisance effects.
- 3.6.3 Visible aviation lighting is expected to be required in the form of nacelle mounted red lights. Where technically and financially feasible and agreed with the relevant stakeholders, the Applicant will seek to utilise an Aircraft Detection Lighting System (ADLS) such that aviation lighting is activated only when required. For the purposes of the EIA, aviation lighting will be assessed on a clearly defined realistic worst case basis, with the implications for

landscape and visual effects and, where relevant, ecological receptors and population and human health described.

- 3.6.4 The Proposed Development is expected to generate approximately 450–520 GWh of electricity per annum, contributing to the delivery of a low carbon, resilient energy system in Wales.

3.7 Decommissioning and repowering

- 3.7.1 At the end of the operational life, the Proposed Development would be fully decommissioned, unless otherwise agreed. Decommissioning activities would be temporary and time limited and are anticipated to be comparable to or less intensive than the construction phase.

3.8 Embedded Design Principles

- 3.8.1 The design of the Proposed Development will be informed by the following principles, with the aim of avoiding and reducing potential environmental effects through iterative design and embedded mitigation:

- Turbine and on-site infrastructure micro siting flexibility;
- Access tracks designed to follow natural contours where practicable;
- A precautionary approach to peat and ground conditions;
- Layout evolution informed by landscape character and known environmental constraints; and
- Commitment to recognised good practice during construction and operation.

- 3.8.2 Any micrositing will be undertaken within clearly defined parameters and will be subject to assessment within the EIA, which will consider the potential environmental effects of reasonable worst-case micrositing scenarios. This will ensure that any micrositing remains within the scope of the Proposed Development and does not give rise to materially different effects from those reported.

3.9 Reasonable Alternatives Considered

- 3.9.1 In accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (Welsh Government, 2017), the EIA will consider reasonable alternatives relevant to the Proposed Development, taking into account the nature of the project, its location, and the stage of design. The consideration of alternatives has been informed by previous feasibility and constraints work undertaken for the site and its surroundings, alongside national and local policy objectives for renewable energy development. At this stage, the Proposed Development remains subject to further design refinement and consultation, and no final layout or design solution has been fixed.

Site Selection Alternatives

- 3.9.2 The selection of the site for the Proposed Development has been informed by an initial review of wind resource, land availability, access, and proximity to environmental and planning constraints. Wider alternative locations were considered at a strategic level; however, many areas within the wider region are subject to significant environmental designations, landscape sensitivities, or policy constraints that would be likely to preclude large-scale onshore wind development. The selected site was identified as having the potential to accommodate a wind energy development, subject to careful design and mitigation, and was therefore taken forward for further consideration.

Layout and Design Alternatives

- 3.9.3 A range of alternative layout and design approaches have been considered at a high level to understand how the Proposed Development could respond to environmental, technical, and operational constraints. These have included variations in turbine siting, distribution across the site, and the extent of development within different parts of the site. This work has demonstrated that landscape, visual, ecological, cultural heritage, hydrological, and residential amenity considerations are likely to influence where development could be accommodated and where areas may need to be avoided or constrained.
- 3.9.4 The design of the Proposed Development is not fixed and will continue to evolve through an iterative process. This process will be informed by detailed technical assessment, baseline surveys, and ongoing engagement with statutory consultees, stakeholders, and local communities. Reasonable alternatives relating to layout, scale, and design will therefore continue to be considered as part of the EIA, with the aim of avoiding or reducing likely significant environmental effects where practicable.

Technology and Scale Alternatives

- 3.9.5 At this stage, the consideration of alternatives has focused on the principle of onshore wind energy as the most appropriate technology to deliver renewable energy generation at the site, given its wind resource and characteristics. Alternative technologies were not progressed further, as they would not meet the project objectives or would be less compatible with the site's physical and environmental context.
- 3.9.6 The scale of the Proposed Development remains subject to refinement. Alternative development scales, including variations in turbine number and arrangement within the agreed design envelope, will be considered through the EIA process to ensure that environmental effects are appropriately assessed and that the final scheme represents a balanced response to policy objectives and environmental constraints.

Ongoing Consideration of Alternatives

- 3.9.7 The assessment of reasonable alternatives will be reported transparently within the Environmental Statement, including an explanation of the main reasons for the selection of the Proposed Development as taken forward. As the design develops, further

alternatives may be identified and assessed where this would assist in avoiding or reducing environmental effects or responding to consultee feedback. The EIA will therefore reflect an iterative design process, proportionate to the scoping stage and consistent with the requirements of the EIA Regulations.

3.10 Cumulative Related Development

- 3.10.1 A number of operational, consented and proposed wind energy developments are located within the wider region, including Nant Mithil Llandinam, Bryn Du and Llanbrynmair. These schemes will be considered as part of the cumulative effects assessment. The cumulative assessment will also consider, where relevant, other consented and reasonably foreseeable developments and land management activities that could act in combination with the Proposed Development, including electricity network infrastructure, and replanting, peatland restoration and other renewable energy proposals.
- 3.10.2 Details of the proposed cumulative assessment methodology is provided in Chapter 19 (Cumulative Effects). The cumulative assessment will address both intra-development cumulative effects (considering the combined effects of the turbines, on-site substation and associated infrastructure) and inter-development cumulative effects with other developments. Where sufficient information is available, the approach will also consider cumulative and combined effects associated with a reasonable worst case grid connection route corridor as described in Section 3.4.
- 3.10.3 A long list of potential cumulative schemes will be compiled as the initial stage of the cumulative effects assessment, drawing on available planning information and consultee input to capture all reasonably foreseeable developments. The approach to identifying, refining and assessing cumulative schemes will be detailed in Chapter 19 of the ES.

3.11 References

Planning Inspectorate, 2018. *Advice Note Nine: Rochdale Envelope*. [Online]

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