
Mynydd Maen Wind Farm

Environmental Impact Assessment Scoping Report

November 2021

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Prepared on behalf of Renewable Energy Systems Ltd

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1 INTRODUCTION

- 1.1 This report has been prepared by Barton Willmore¹, on behalf of Renewable Energy Systems Ltd ("RES" or the "Applicant"). The report accompanies a request for an Environmental Impact Assessment (EIA) Scoping Direction from Welsh Ministers in accordance with Regulation 33 of the *Town and Country Planning (EIA) (Wales) Regulations 2017*² (the "EIA Regulations") with respect to the proposed wind farm on land between Cwmbran, Newbridge and Pontypool, at Mynydd Maen in South Wales.
- 1.2 As the scheme comprises an electricity generating station with an installed generating capacity of between 10 and 350 MW, it falls within the definition of a 'Development of National Significance' (DNS) under section 4(1) of the Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016 (as amended), for the purposes of s62(D) of the Town and Country Planning Act 1990, as amended by s19 of the Planning (Wales) Act 2015.
- 1.3 In accordance with the EIA Regulations, a person who is minded to make an application for planning permission for a potential DNS may ask the Welsh Ministers to state in writing the scope and level of detail of the information to be provided in the Environmental Statement (ES) (a "Scoping Direction").
- 1.4 Regulation 33 (2) of the EIA Regulations states that a scoping request must be accompanied by:
- (i) a plan sufficient to identify the land;
 - (ii) a brief description of the nature and purpose of the development, including its location and technical capacity;
 - (iii) an explanation of the likely significant effects of the development on the environment;
 - (iv) a statement that the request is made in relation to a development of national significance for the purposes of section 62D of the Town and Country Planning Act 1990; and
 - (v) such other information or representations as the person making the request may wish to provide or make.
- 1.5 In addition to the above, Appendix 3 of Planning and Environment Decisions Wales (PEDW)

¹ Institute of Environmental Management and Assessment (IEMA) qualified assessors and Environmental Impact Assessment (EIA) Quality Mark registrants

² WSI 2017/567

Procedural Guidance³ sets out that a Scoping Report should include the following 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 (for example, a high level assessment of the grid connection where this does not form part of the proposed development for a power station);
- 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; and
- Key topics covered as part of applicants' scoping exercise; and
- An outline of the structure of the proposed ES.

1.6 In accordance with the requirements of Regulation 33, this request for a Scoping Direction is made in relation to a DNS for the purposes of section 62D of the Town and Country Planning Act 1990.

³ PEDW Procedural Guidance – Appendix 3: Environmental Impact Assessment (guidance prepared by the Planning Inspectorate prior to the establishment of PEDW)

2 THE SITE AND PROPOSED DEVELOPMENT

Site Context

- 2.1 The site (shown at **Appendix 1**) is located adjacent to the south of Pontypool, adjacent to the west of Cwmbran, approximately 1.6km to the north of Risca and approximately 2km to the east of Newbridge. In addition, the city of Newport is located approximately 5km south of the site at its nearest extent. The wider road network surrounding the site includes the A467, A4042 and A4051, which form connections between the areas of settlement. The site is divided broadly east-west by the administrative boundaries separating Caerphilly County Borough Council (CCBC) and Torfaen County Borough Council (TCBC).
- 2.2 The Prince of Wales Industrial Estate lies approximately 2km to the south west of the site in Abercarn. The site is situated within close proximity to a network of electricity transmission pylons which follow a broadly north-south alignment. The remainder of the land surrounding the site primarily comprises agricultural fields and woodland.
- 2.3 Wind farm development within the surrounding area consists of a two turbine scheme at Oakdale Business Park, located approximately 4.6 km to the north west. Two single turbines to the south of Newport, overlooking the mouth of the River Severn, lie over 10km from the site.
- 2.4 The Brecon Beacons National Park is located approximately 2km to the northeast of the site, at the nearest extent. The Blaenavon Industrial Landscape, situated approximately 10km north of the site is designated as a World Heritage Site. There are a number of scheduled monuments, including Twm-Barlwm Mound and Bailey Caste within 5km of the site.

Site Description

- 2.5 The site (shown on **Appendix 1**) extends to approximately 2,029 ha and predominantly comprises rough pastoral grassland, scrub and scattered deciduous woodland. The north western portion of the site includes pockets of coniferous woodland. The site lies approximately 472 m above ordnance datum (AOD) at its highest point. Telecommunication masts are present in the northern portion of the site. Settlement within the site is limited to dispersed dwellings located within Penyrheol, including Hill Farm.
- 2.6 A number of Public Rights of Way (PRoW) cross the site, forming wider connections with surrounding residential areas and the local road network. A section of the Celtic Way long

distance walking route also follows the southernmost boundary of the site. The corridor of the A472 forms a short section of the north western boundary of the site. However, the site itself forms remote upland that includes steep upper valley slopes with access limited to single track roads.

- 2.7 The site is drained by a series of watercourses, with those in the south westerly portion of the site forming tributaries of the River Ebbw. Streams in the northern section of the site fall into Cwm Lickey and the Afon Lwyd to the north. A number of disused quarries and shafts characterise the landscape within both the northern and southern extents of the site.

The Development

- 2.8 An application will be submitted for a wind farm of up to 15 turbines (with a generating capacity of up to approximately 75MW), with a maximum tip height of 149.9m from ground level.
- 2.9 The Project is still in the design stage, as such the infrastructure requirements and layout will evolve throughout the EIA process. However, to ensure that an accurate response to this EIA scoping request can be provided by Welsh Ministers (and Statutory Consultees), the main components of the Project, as outlined in this section, are considered worst case.
- 2.10 Based on the initial constraints work which has been carried out, the Project is considered to have sufficient capacity for up to 15 horizontal-axis wind turbines and associated infrastructure. An indicative layout has been established to provide a basis for this report in **Appendix 1**. This initial design will, of course, be subject to change based on any technical and environmental constraints that become evident throughout the EIA process.
- 2.11 The following components would form permanent features throughout the life of the Project:
- Wind turbines;
 - Wind turbine transformers and switchgear (if located outside the wind turbine tower);
 - Turbine foundations;
 - Crane hardstandings;
 - Control building, substation, and storage compound;
 - Electrical cabling; and
 - On-site access tracks, entrances, and exits.

Wind turbines

- 2.12 The wind turbine industry is evolving at a significant rate. Designs continue to improve technically and economically. The most suitable turbine model for a particular location can change with time and, therefore, a final choice of turbine for the Project has not yet been made. The most suitable machine would be chosen before construction, within the overall height limit assessed as part of the EIA and consented as part of the DNS application.
- 2.13 For the purposes of this report, indicative turbine dimensions would be: a hub height of 89.9m and a rotor diameter of 120m; giving an overall tip height of 149.9m from ground level. The indicative capacity of each wind turbine is 5 Megawatts (MW). The turbines would be painted in a visually recessive colour, typically a light grey or white.

Wind turbine transformers and switchgear

- 2.14 For most current wind turbine models, the transformer and switchgear is located alongside the base of each tower, although for larger turbines some manufacturers install the transformer in the nacelle or tower base. At this stage it is unknown if an internal or external transformer would be used, but the latter has been selected for the purpose of a worst case assessment (i.e. from a land-take and visual perspective).

Turbine foundations

- 2.15 The wind turbines would be supported on steel reinforced concrete foundations. A typical gravity-base foundation will be used if the ground conditions are found to be suitable. The exact quantities of concrete, reinforcement, diameters and depths would vary depending on the actual make of turbine used. Different turbine foundations may also be considered for different turbine locations depending on the local ground conditions. The dimensions, materials, and construction processes associated with the turbine foundations considered as part of the EIA will be clearly outlined within the ES.

Crane hardstanding

- 2.16 The turbines will be erected using mobile cranes. These require areas of permanent hardstanding adjacent to the turbine locations, which can support the load of the cranes on their outriggers. Typically, these consist of one main permanent area adjacent to the turbine position where the main turbine erection crane would be located. The dimensions, materials, and construction processes associated with the crane hardstanding considered as part of the EIA will be clearly outlined within the ES.

Control building, substation, and storage compound

- 2.17 The control building compound would accommodate metering equipment, switchgear, the central computer system, and electrical control panels. A spare-parts store room, toilet and wash basin along with a kitchenette would also be located in the control building. Although not permanently staffed, the buildings would be visited periodically by maintenance personnel.
- 2.18 The sub-station compound would contain power quality improvement equipment, up to two auxiliary transformers, and possibly a spare turbine transformer.
- 2.19 The energy storage devices will consist of a number of permanent containers mounted on small concrete foundations.
- 2.20 The location, overall size, and individual structures contained within the compound will be clearly defined within the ES.

Electrical Cabling

- 2.21 The turbines would be electrically connected to the substation by means of 33kV cables. These cables would be laid underground (where possible) in trenches running adjacent to the on-site access tracks.

On-site access tracks, entrances, and exits

- 2.22 A network of access tracks will be required to provide access to each turbine location within the Project. Existing tracks will be utilised wherever reasonably practicable and upgraded as required. Tracks will typically be 5m wide with appropriate widening at corners and passing places, as required. RES will consult with appropriate consultees regarding the location of new access tracks which interact with areas of common land, sensitive habitats, and hydrological features.
- 2.23 The location and design of any Site entrances/exits as part of the Project will be discussed with the relevant Statutory Consultees as part of the iterative design process. Any off-site mitigation works required to facilitate the movements of Abnormal Indivisible Loads (AILs) will be identified by swept path analysis.

Temporary infrastructure

2.24 The following components would form temporary features throughout the construction phase of the Project:

- Temporary enabling works and construction compounds;
- Hardstanding for lay-down areas; and
- Power performance masts.

Temporary enabling works and construction compounds

2.25 Enabling works are erected at the beginning of the construction period. Upon completion of any initial access tracks to the main development area, temporary structures associated with the enabling works would be transferred to a construction compound. The location(s), size, and individual structures contained within the enabling works and construction compound(s) will be clearly defined within the ES. Each temporary construction compound may contain temporary site offices and with services including sealed waste storage toilet facilities; sufficient parking for cars and construction vehicles; containerised storage facilities and a receiving area for incoming vehicles.

Hardstanding for lay-down areas

2.26 Areas of temporary hardstanding would also be required as part of the crane hardstanding general arrangement, this would be required during the erection of the wind turbine for laying down wind turbine components and access.

Power performance masts

2.27 Temporary guyed meteorological masts, known as power performance or calibration masts, up to the final hub height may be required to confirm the detailed wind flow of the Project.

2.28 These masts are raised concurrent to turbine erection and the data they gather is used in the acceptance tests on the turbines.

2.29 If required, the masts will be raised around the same time as the turbine foundations are poured and run for approximately six months during turbine operation.

Access to the Project

- 2.30 The proposed access route to the site originates at the Port of Entry (PoE), the Port of Swansea, and via Baldwin Crescent and the A483 joins the M4 heading east. Turbine component delivery vehicles will exit the M4 at junction 28 and proceed north on the A467 before exiting onto Central Avenue. Abnormal Indivisible Loads (AILs) will continue northeast along Central Avenue, Old Pant Road, and Pant Road before turning east onto an unnamed single track road proceeding for approximately 1.3km towards the site entrance. It's likely that some widening and road upgrade works will be needed to allow safe passage of AILs along the unnamed road.

Grid connection

- 2.31 If overhead lines are necessary, the electrical connection between the Project and the grid network will be subject to a separate DNS application under Regulation 4B of the Developments of National Significance (Specified Criteria and Prescribed Secondary Consents (Wales) Regulations 2016. Detailed environmental studies and reporting will accompany any separate planning application. If sufficient detail is available from the Distribution Network Operator (DNO) at the time of writing, the ES for the Project will include consideration of the environmental effects of the indicative grid route corridor.

Phased lifetime of the Project

Construction phase

- 2.32 It is currently estimated that a construction period of 12-18 months would be scheduled for the Project. The main phases of the construction period would include:
- Access route road improvements;
 - Site entrance construction;
 - Construction/upgrade of on-site access tracks;
 - Construction of temporary construction compound and hardstandings;
 - Construction of turbine foundations, requiring the import of concrete and steel;
 - Construction of the control building, substation, and storage components;
 - Excavation of trenches and laying of cables alongside Site tracks;
 - Connection of distribution cables;
 - Delivery and erection of wind turbines;
 - Commissioning of site equipment; and

- Site demobilisation and restoration.

2.33 Some of these activities will be carried out concurrently in order to reduce the length of the construction programme. Site restoration will be conducted as early as possible.

Vehicle movements during Construction

2.34 Vehicle movements associated with construction works will include:

- Cars and minibuses for transporting construction personnel onto the Site;
- Heavy goods vehicles (HGVs) for pre-construction delivery of site offices and construction equipment;
- AILs transport vehicles for delivery of the turbine components and base rings;
- Two mobile road going cranes, used for the erection of the turbines; and
- Standard HGVs for transporting electrical cable, steel reinforcement for foundations, construction plant fuel and other items and equipment.

2.35 A Traffic Management Plan (TMP) will be prepared in consultation with the local highway authority and other stakeholders to address scheduling and routing of deliveries, and any mitigation measures pertinent to the project.

Operational phase / maintenance

2.36 A wind farm is typically visited up to four times a month by a small maintenance crew. There will also be a requirement for maintenance of the access tracks and substation.

Decommissioning

2.37 Turbines typically have an operational life of 25-30 years and at the end of this period the turbines can be removed, reconditioned or replaced in accordance with planning permission requirements, and appropriate site restoration measures implemented. Effects from decommissioning are generally similar to those associated with construction, and would not be expected to be greater than those identified for construction.

3 SCOPING

- 3.1 This scoping exercise has been informed by desk-based research, professional judgement and other information available for the site. Table 1 provides a summary of the scoping exercise.

Table 1: EIA Scoping Summary

Topics	Potential Construction Phase Effects	Potential Operational Phase Effects	Likely Significant Effects (Pre-Mitigation)	Comments
Socio Economics	✓ - T	✓ - P	✓	Chapter to be prepared.
Landscape and Views	✓ - T	✓ - P	✓	Chapter to be prepared.
Ecology	✓ - T	✓ - P	✓	Chapter to be prepared.
Ornithology	✓ - T	✓ - P	✓	Chapter to be prepared.
Cultural Heritage	✓ - T	✓ - P	✓	Chapter to be prepared.
Transport and Access	✓ - T	✓ - P	✓	Chapter to be prepared.
Noise	✓ - T	✓ - P	✓	Chapter to be prepared.
Shadow Flicker	✓ - T	✓ - P	✓	Chapter to be prepared.
Air Quality	x	x	x	Topic scoped out of the ES
Water Resources and Flood Risk	x	x	x	Topic scoped out of the ES
Ground Conditions and Land Contamination	x	x	x	Topic scoped out of the ES
Human Health	x	x	x	Topic scoped out of the ES
Aviation and Defence	x	x	x	Topic scoped out of the ES
Telecommunications	x	x	x	Topic scoped out of the ES
Wind Microclimate	x	x	x	Topic scoped out of the ES
Agricultural Land	x	x	x	Topic scoped out of the ES
Waste	x	x	x	Topic scoped out of the ES
Accidents and Disasters	x	x	x	Topic scoped out of the ES
Climate Change	x	x	x	Topic scoped out of the ES

Key: ✓ Likely Significant Effect / x No Likely Significant Effect.
T – Temporary Effect / P – Permanent Effect

Environmental Disciplines Scoped Out

- 3.2 Further information on the topics scoped out of the EIA in Table 1 is set out in the following sections.

Air Quality

- 3.3 The effects arising from the proposed development on air quality will be limited to the

construction phase and relate to dust and exhaust emissions from fixed and mobile construction plant and construction vehicles.

- 3.4 Construction works will be localised and short term and effects will be managed by best practice measures implemented through a Construction Environmental Management Plan (CEMP), which would be secured by a planning condition following planning approval.
- 3.5 As stated above, the construction phase will last 12-18 months. During construction, the peak number of construction vehicles will be 60 per day, with an additional 25 vehicles for construction workers. Due to the level of traffic movements and duration of impacts, any effects associated with construction vehicles are not expected to be significant.
- 3.6 For turbine components, a peak of 6 abnormal load vehicles per day will use the proposed access route originating at the Port of Swansea, during turbine delivery times. Those vehicles will pass adjacent to one Air Quality Management Area (AQMA) on their way to the Site (Taibach/Margam AQMA, Neath Port Talbot). Due to the level of additional vehicle movements, any effect on air quality is not expected to be significant
- 3.7 Due to the nature of the proposed development, the operational phase would not result in significant effects on air quality. The vehicle movements associated with the maintenance of the wind turbines will be minimal and would not cause significant effects on air quality due to an increase in traffic at the site. Given the above, including the implementation of the CEMP which will ensure that any adverse impacts on air quality is appropriately mitigated, no significant impacts are predicted, and therefore this topic has been scoped out of the ES.

Water Resources and Flood Risk

- 3.8 Natural Resources Wales Flood Map⁴ shows that the site is largely located within Zone A and is therefore considered to be at little or no risk of fluvial or coastal/tidal flooding. There are limited areas of Zone C2 within the south of the site, which are associated with two brooks (Cwm Gwyddon and Cwmcarn Forest).
- 3.9 Construction impacts on surface water will be managed in accordance with best practice which will be outlined in the future CEMP. Due to the nature of the proposed development, it will not result in an increased demand on clean water supply and on foul drainage networks and existing sewer system capacity.

⁴ <https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en>

- 3.10 The proposed development will result in an increase in impermeable surfacing on the site, in terms of the hardstanding that will be required beneath the turbines and additional areas of hardstanding for the crane that will position the turbines into place. Surface water will be managed through the use of appropriate Sustainable Drainage Systems (SuDS) techniques, which will be secured through a separate application to the SuDS Approving Body (CCBC and TCBC).
- 3.11 The implementation of the CEMP will ensure that any adverse impacts on the water environment and flood risk is appropriately mitigated and as such no significant impacts are predicted, and therefore this topic has been scoped out of the ES.

Ground Conditions and Land Contamination

- 3.12 The site comprises rough pastoral grassland, scrub and scattered deciduous woodland and therefore is not likely to be heavily contaminated. The site is not located on a Principal Aquifer as shown on Natural Resources Wales map⁵ and is not within a Drinking Water Groundwater Safeguard Zone. The site is not located within, or within proximity of, a groundwater Source Protection Zone. The site has historically been used for coal mining. A Coal Mining Risk Assessment (**Appendix 2**) has been undertaken for the site and concludes that mining related ground instability poses very low to negligible risk within the site and no past recorded and no probable (unrecorded) mine working within shallow depth has been identified. The multiple levels of past deep mine working recorded below the hilltop and the site lie too deep to impact surface ground stability at any of the turbine positions. There is no desk top evidence of surface mining disturbance, mine entrances or spoil heaps within the site only quarrying of the Hughes Sandstone which dominates the geology of the site, but the report does include a recommendation for intrusive investigation works to rule out risks. The report concludes that mining stability and mine gas risks posed by the strata beneath the site from historical coal mining can be mitigated by routinely adopted measures and no significant effects are anticipated.
- 3.13 Any hazardous and potentially contaminative substances used during the construction phase would be stored and handled in accordance with all applicable legislation, therefore avoiding likely significant effects. No highly contaminative land uses are proposed and the operation of the development is not anticipated to give rise to likely significant effects with respect to contamination. Therefore, no significant effects are likely, and this topic has been scoped out of the ES.

⁵ <https://maps.cyfoethnaturiolcymru.gov.uk/>

Human Health

- 3.14 The proposed development is for a wind farm and will not increase housing supply in the area, therefore the proposed development will not result in likely significant effects on primary healthcare (GP and dentist provision) and education in terms of increased demand. The proposed development is not likely to result in significant effects on the construction or maintenance workforce, as safe working practices will be adhered to in accordance with the requirements of the Health and Safety Executive and relevant legislation including the Construction (Design and Management) Regulations 2015⁶, which will minimise the potential for accidents and other situations with a detrimental effect on employees' health. The proposed development is not likely to result in significant effects on human health as a result of contamination. Potential effects on human health as a result of air quality and noise will be mitigated through standard mitigation measures implemented through a CEMP, which will be secured by a planning condition following planning approval. These measures will be outlined in the Noise Chapter of the ES and will ensure that significant effects are not likely. On this basis, an assessment of human health has been scoped out of the ES.

Aviation and Defence

- 3.15 Large scale wind farm developments have the potential to have a significant impact on primary radar stations, secondary radar stations, and weather radar stations, and thus affect operational safety. The site is not located within a Low Flying Zone. Consultation will be carried out with NATS En-Route Ltd (NERL), the Ministry of Defence (MoD) and relevant airport operators as part of the design process. Likely significant aviation and defence effects are not anticipated and this topic has been scoped out of the ES.

Telecommunications

- 3.16 Wind farm developments have the potential to interfere with electromagnetic signals passing above ground. Consultation will be carried out with OFCOM, television, telecommunication, and other utility providers to clarify that there are no links crossing the Site that will be impacted by the proposed development. The turbine layout will be designed to avoid direct impact on any identified links, and where this has been a consideration, it will be identified as part of the design evolution of the scheme within the ES. On the basis that a technical mitigation solution can be implemented, likely significant telecommunications effects are not anticipated and a specific chapter on this topic has been scoped out of the ES.

⁶ <https://www.legislation.gov.uk/ukxi/2015/51/contents/made>

Wind Microclimate

- 3.17 The proposed development is for a wind farm, therefore no buildings for public use are proposed and as such, significant wind effects on pedestrian amenity are not likely and the aspect has been scoped out of the ES.

Agricultural Land

- 3.18 The site comprises rough pastoral grassland, scrub and scattered deciduous woodland, and a review of the Lle Portal shows that the proposed development is situated on land classed as Grade 4, Grade 5, and Non Agricultural Land according to the Predictive Agricultural Land Classification (ALC) Map, and would not result in a loss of Best and Most Versatile (BMV) agricultural land. As such, the proposed development will not generate significant effects on agricultural land and this topic has been scoped out of the ES.

Waste

- 3.19 The proposed development is not anticipated to produce significant amounts of waste to the extent that the creation or disposal of which would give rise to significant effects on the environment. The CEMP to be secured by a planning condition following planning approval, would detail the mitigation measures to be implemented during the construction phase to minimise waste and ensure that it is stored, managed, collected and disposed of appropriately. The implementation of the CEMP will ensure that any adverse impacts on waste is appropriately mitigated and as such no significant impacts are predicted, and therefore this topic has been scoped out of the ES.

Accidents and Disasters

- 3.20 The proposed development is for a wind farm which is not considered to be hazardous. The site is not in a location which is at risk of disasters such as, land instability or earthquakes. During the construction phase, the contractor(s) would implement measures in accordance with Health and Safety legislation, and best practice, to minimise the risks of accidents that would have effects on people or the environment. All such measures would form part of the CEMP. As above, a Coal Mining Risk Assessment has been undertaken for the site and concludes that mining stability and mine gas risks from historical coal mining can be mitigated by routinely adopted measures and no significant effects are anticipated. The implementation of the CEMP will ensure that any adverse impacts on accidents and disasters are appropriately mitigated and as such no significant impacts are predicted, and therefore this topic has been scoped out of the ES.

Climate Change

- 3.21 The proposed development will provide a means for generating renewable energy, therefore will contribute to climate change mitigation. The proposed development will include identification of the future climate in assessments within the ES, including Flood Risk. Accordingly, an assessment of climate change and greenhouse gases, as a separate chapter, has been scoped out of the ES. An Energy and Sustainability Statement will be submitted with the planning application. This will include a 'carbon calculation' that will present the carbon emissions associated with the development. Due to the nature of development, significant adverse effects are not considered likely, and therefore the topic has been scoped out of the ES.

Environmental Disciplines Scoped In

- 3.22 For each of the topics scoped into the assessment further information on the details to be included in the assessment and the methodology to be employed are set out below.

4 SOCIO-ECONOMICS

4.1 An assessment of potential social and economic effects of the proposed development on the local and wider area will be undertaken. This will include construction phase (temporary) and operational phase (permanent) effects. The socio-economic issues are anticipated to include changes to, and effects on:

- Employment and job creation; and
- Public access.

4.2 The assessment will identify the potential impacts and set out the socioeconomic baseline of the local (5km), regional (Caerphilly and Torfaen County Boroughs) and national (Wales) area.

4.3 In relation to Public Access, the site is located on common land, and therefore a secondary consent will be required to accompany the DNS application, either under Sections 16 & 17, or Section 38 of the Commons Act 2006.

Baseline

4.4 Baseline data will be collated in various ways. The most up to date, publicly available data will be used wherever possible. The data will be used to generate a picture of the baseline conditions across the study area for context. Data sources will include, but not be limited to:

- Census 2011;
- Annual Population Survey;
- NOMIS (official labour market statistics);
- Business Register and Employment Survey;
- Index of Multiple Deprivation;
- Local authority reporting and statistics.
- Wales Tourism Alliance; and
- Visit Wales

Approach

4.5 There is no standard approach to this element within an EIA; however the general approach will be to outline the areas of the Project where there will be the potential for some economic / social effect within the wider area. This will be undertaken with a view to examining the significance of these effects. Where possible (quantifiable), 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.

Summary

- 4.6 Table 2 summarises the socio-economic effects to be included ('scoped in') for detailed assessment in the ES.

Table 2: Socio-economic Issues

Receptor	Effects	Scoped In
Employment	Increase in short term construction employment and long-term operational employment	✓
Public access	Erection of turbines and associated infrastructure on common land	✓

5 LANDSCAPE AND VISUAL AMENITY

- 5.1 An assessment will be undertaken of the likely significant effects of the proposed development on the environment with respect to landscape and views.

Baseline

- 5.2 The site is located within an elevated area of predominantly rough grassland between the settlements of Newbridge, Pontypool and Cwmbran known as Mynydd Twyn-glas, straddling both Caerphilly and Torfaen County Boroughs.
- 5.3 The turbines will be located within the Pre-Assessed Areas for Wind Energy (Area 10) as designated in Future Wales. Policy 17 of Future Wales states that:

"In Pre-Assessed Areas for Wind Energy 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 (including repowering) in these areas, subject to the criteria in policy 18."

- 5.4 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 follows:
- *"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 Blaenafon 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;*
- *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; and*
- *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."*

5.5 With respect to LANDMAP, the majority of the site lies within the Mynydd Llywd and Mynydd Maen Visual and Sensory aspect area, which is described as *"areas of upland comprising both heath and grassland on the western slopes of both Mynydd Maen and Mynydd Llwyd. These areas are largely flanked by coniferous plantation woodland with more open areas to the east. More westerly areas in valleys have smaller field patterns. Some views to adjacent upland areas and to urban area of Newbridge in the valley to the west"*.

5.6 The site does not lie within any nationally designated landscape, although the Brecon Beacons National Park is located appropriately 2km to the north-east of the site at its nearest point. In addition, the Wye Valley Area of Outstanding Natural Beauty (AONB) lies approximately 20km to the east.

5.7 At a local level, the site lies within the locally designated Abercarn Visually Important Local Landscape (VILL) within Caerphilly, and within the South West Uplands Special Landscape Area (SLA) within Torfaen. A series of other locally designated landscape lie within the wider surroundings to the site, as well as the Blaenavon Industrial Landscape World Heritage Site.

Approach

5.8 The assessment would be undertaken in accordance with Landscape Institute and Institute of Environmental Management and Assessment, 'Guidelines for Landscape and Visual Impact Assessment' (Third Edition, 2013) (GLVIA 3), which relies on professional judgement rather than a matrix assessment of effects, as outlined in the 'Environmental Statement Structure' section of this report. The assessment would include the potential landscape and visual effects of the proposed development, during the construction and operational phases. In addition,

Scottish Natural Heritage (SNH) (now NatureScot) has published a number of documents that have been adopted nationally as industry standard good practice on landscape and visual assessments of wind farm proposals, with Natural Resources Wales providing guidance with respect to LANDMAP.

- 5.9 The Landscape and Visual Impact Assessment (LVIA) will be completed by Chartered Members of the Landscape Institute (CMLIs) that are suitably qualified to undertake the work and in accordance with the relevant best practice guidance.
- 5.10 Baseline information for the study area will be collated, which will include topography, landscape planning policy designations, published sources of landscape character (including LANDMAP), representative views from selected photograph viewpoints and any other relevant information. Assessments will be made at the baseline year 2022, during construction, and on completion. Where the project programme allows, these assessments will relate to the winter period in order to depict the visual baseline without the benefit of leaf cover.
- 5.11 In accordance with current good practice, this assessment will address landscape and visual effects as separate issues. Landscape effects relate to both the effect on the physical features of the site, and on the landscape character of the site and surrounding area. Visual effects relate to typical views of the proposed development from the surrounding area. The LVIA will focus on receptors that are likely to experience significant effects rather than cataloguing every effect that may arise.
- 5.12 In line with the SNH guidance of the Visual Representation of Wind Farms, an initial study area for the proposed development will cover a radius of up to 45km from the outermost turbines. The initial Zone of Theoretical Visibility (ZTV) is provided in **Appendix 3**. From our experience we anticipate that potentially significant effects are unlikely to occur beyond 20km with turbines of the scale and location proposed. In accordance with LANDMAP Guidance Note 3, all five LANDMAP aspect areas will be considered in the LVIA as relevant.
- 5.13 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 landscape officer (or equivalent). A preliminary list of LVIA viewpoints (to be refined through fieldwork and consultation) has been identified, with the locations of viewpoints illustrated on **Appendix 3**. These are the following:
- Viewpoint 1: Cambrian Way Car Park;
 - Viewpoint 2: Presoch Lane;
 - Viewpoint 3: A4042 / New Inn;

- Viewpoint 4: Llandegfedd Reservoir;
- Viewpoint 5: B4236 / Llanfrechfa;
- Viewpoint 6: Twmbarlwm;
- Viewpoint 7: A472 / Newbridge;
- Viewpoint 8: B4471 / Swffryd;
- Viewpoint 9: Pen-y-fan Pond Country Park;
- Viewpoint 10: St Illtyd;
- Viewpoint 11: Cefn Manmoel;
- Viewpoint 12: Pen Garn-Bugail / Gelligaer Common;
- Viewpoint 13: Rhymney Valley Ridgeway Walk;
- Viewpoint 14: Cefn Eglwysilan;
- Viewpoint 15: Mynydd Machen;
- Viewpoint 16: Betws;
- Viewpoint 17: Ridgeway;
- Viewpoint 18: Lodge Hill;
- Viewpoint 19: Pen-y-cae-mawr;
- Viewpoint 20: B4293 / Devauden;
- Viewpoint 21: Llancayo;
- Viewpoint 22: Blorengel;
- Viewpoint 23: B4560;
- Viewpoint 24: Pen y Fan; and
- Viewpoint 25: A4107 / Craig Ogwr.

5.14 In summary, the assessment will:

- Define the study area for the site, identifying key landscape receptors and separately, key visual receptors and their typical/ representative views to be used for the visual impact assessment;
- Assess the value, susceptibility to change and overall sensitivity of the landscape and visual receptors (the receiving environment);
- Assess the magnitude of landscape and visual effects;
- Assess the significance of landscape and visual effects;
- Identify ways in which adverse effects on landscape and/or visual amenity could be avoided, reduced and consider requirements for any mitigation measures;
- Summarise any residual effects following mitigation; and
- Cumulative effects of any known developments.

Summary

- 5.15 Table 3 summarises the landscape and visual receptors identified for inclusion in the assessment.

Table 3: Landscape and Views

Receptor	Effects	Scoped In
Typical views from publicly accessible locations, including roads, footpaths and public open spaces	Visual effects on users	✓
Landscape features, including existing vegetation	Landscape effects on the landscape resource	✓
Landscape Character	Effects on landscape character areas (including LANDMAP aspect areas)	✓

6 ECOLOGY

- 6.1 This section has been written by BSG Ecology and sets out the proposed approach to assessing the potential ecological effects of Mynydd Maen Wind Farm. For the purposes of ecological survey and assessment work the site and the survey area are contiguous and are indicated by the red line in **Appendix 4** 'Phase 1 habitats'.
- 6.2 Ornithological effects are considered in Section 7.

Baseline

Desk-based review

- 6.3 Existing biological records and information on statutory and non-statutory designated sites were provided by South East Wales Biodiversity Records Centre (SEWBReC). This included records of protected, invasive, or otherwise notable species within 2 km of the Site (and 10 km for bats in line with recommendations in industry standard guidance). Freely available aerial photography and Ordnance Survey mapping have been used to identify ponds within 250 m of the Site boundary.

Consultation

- 6.4 Consultation meetings have been held with County Ecologists from TCBC and CCBC on 28 April 2021 and 13 May 2021 respectively. Ecologists from both councils stated that they were happy with the scope of the ecological survey to date. It was agreed that a second year of consultation, with both TCBC and CCBC present at meetings, would be beneficial, particularly to discuss mitigation and enhancement opportunities in order to deliver a net benefit for biodiversity in line with Policy 18 of Future Wales.
- 6.5 Mark Anthoney (Torfaen moth recorder) was consulted on the potential for Silurian moth *Eriopygodes imbecilla* presence on site, as there are suitable areas of supporting habitat.
- 6.6 Several requests have been made to Natural Resources Wales (NRW) for a Discretionary Planning Advice Service (DPAS) meeting to discuss the scope of baseline ecological work required to inform a planning application for the development. To date NRW have been unable to accommodate a meeting.

Survey methods

- 6.7 A Phase 1 Habitat Survey of the Site was completed over three days in early to mid-July 2020. The work was based on industry standard (JNCC, 2010) survey guidance and involved mapping all broad habitat types within the Site. The survey was extended to consider the potential of the habitats to support protected species.
- 6.8 To provide more detailed habitat information, the surveyor also attributed all areas of grassland, heath and mire habitat within the survey area to plant communities published within the National Vegetation Classification (NVC) (Rodwell 1991; 1992). NVC communities were assigned based on the experience of the surveyor, and with reference to the community descriptions and keys in Rodwell (1991,1992).
- 6.9 In addition, a great crested newt (GCN) eDNA sample collection from five ponds (ponds 3, 6, 10,11 and 12) was completed on the 3rd and 4th of June 2020 (the remaining seven ponds were dry at the time of survey and therefore unsuitable for sampling). Although eDNA returned a negative result, the desk study returned records for GCN in 3 ponds on site, so eDNA sampling was repeated earlier in the season on 15 April 2021 at ponds 1-6 and 9-12 (Ponds 7 and 8 were dry at the time of survey). Ponds are shown on **Appendix 5** 'Pond locations'.

Statutory sites

- 6.10 There is one Site of Special Scientific Interest (SSSIs) within 2 km of the Site; Ty'r Hen Forwyn approximately 1.4 km to the north-west. This SSSI is notified for its habitats including species-rich neutral grassland and a population of the nationally scarce plant wood bitter-vetch *Vicia orobus*. Within the wider landscape there are additional SSSIs. These include Henllys Bog, 3.2 km to the south, and Coed-y-Darren, 4 km to the south south-west, of the turbine array. These SSSIs were notified for their rich fen habitat (Henllys Bog) and geological interest respectively. It is unlikely that there will be significant effects on the ecological interest of statutory designated sites (alone or cumulatively) as a result of the proposed wind farm, so statutory designated sites will be scoped out.

Non-statutory sites

- 6.11 There are 57 Sites of Importance for Nature Conservation (SINC) within 2 km of the site. This includes a series of SINC's which together cover the entire Site boundary as follows:

- a. *Within the Caerphilly County Borough Council boundary, Mynydd Maen (east of Newbridge) is designated for its extensive area of*

upland with semi-natural habitats, including acid grassland and heath and for locally significant bryophyte species (the latter located in woodland outside the Site boundary). The Gwydon Valley is designated for conifer plantation which retains some semi-natural ground flora and is noted as containing some areas of habitat potentially suitable for dormouse Muscardinus avellanarius

- b. In Torfaen, Mynydd Henllys Common is designated for disused quarries, and Mynydd Maen/Mynydd Llwyd Common and Edlogan Common are designated for common land.*

- 6.12 SINC directly adjacent to the northern Site boundary include Coedcae Watkin Dafydd and Coed Golynos, semi-natural woodland. These are plantation woodland areas on ancient woodland sites (PAWS) retaining a range of semi-natural woodland indicator species. Penyrheol Marshes SINC is located approximately 350 m from the eastern Site boundary. No further information was provided on this SINC in the desk study but it is likely to be designated for wetland habitats and has hydrological connectivity to the Site via Cwm Lickey.
- 6.13 There are 49 additional SINC located within 2 km of the site boundary, and there are 197 ancient woodland compartments within 2 km of the Site. SINC that were designated for their habitat features and are not within the Site, adjacent to the Site boundary or likely to be hydrologically connected to the Site will be scoped out, as there is no clear effect pathway for impacts on these Sites.

Habitats

- 6.14 Phase 1 habitat survey results are shown on **Appendix 4** 'Phase 1 Habitats'.
- 6.15 The predominant habitat type within the Site is dry heath, which occurs on most of the higher ground. The condition and dominant species vary across the Site, which is likely to be attributable to a combination of previous management and current grazing levels. The NVC communities present (H12a and c) are both included in Annex 1 priority habitat 4030 European dry heaths. Impacts on dry heath are likely to be subject to detailed assessment unless impacts can be limited through design.
- 6.16 Acid grassland occurs on the western and southern edges of the Site, with a smaller area around the mast at Mynydd Twyn-glas. The vegetation is a good fit to the U5, U4, and in small areas U6 NVC grassland communities. The acid grassland on Site does not conform to any priority habitat descriptions. Impacts on acid grassland are unlikely to be subject to detailed assessment.
- 6.17 Wet heath is present in a few localised areas, most frequently in the southern and western

parts of the Site. The habitats best fit with NVC community M25a. Wet heath on Site does not fit the definition for the Annex 1 priority habitat '4010 Northern Atlantic wet heaths with *Erica tetralix*'⁷ but does meet the criteria for the Section 7 habitat of principal importance (HPI) 'Upland Heath'. Impacts on wet heath will be avoided through design and are unlikely to be subject to detailed assessment.

- 6.18 Marshy grassland is infrequent across the Site, typically occurring as localised stands associated with areas of disturbance, such as in places along the gas pipeline easement and edges of trackways. This habitat (NVC community M23b) does not correspond to any priority habitat descriptions. Impacts on marshy grassland are unlikely to be subject to detailed assessment.
- 6.19 Two small acid flushes were recorded within the Site boundary, above Cwm Carn. The vegetation is similar to that described above for marshy grassland, but includes some *Sphagnum fallax* which allows referral to acid flush. This habitat corresponds to the Section 7 HPI 'Upland Flushes, Fens and Swamps'. Impacts on acid flushes will be avoided through design and are unlikely to be subject to detailed assessment.
- 6.20 There are several ponds within the Site boundary (locations are shown on **Appendix 5** 'pond locations'). These are typically heavily poached at the margins where they have been used for drinking by livestock and have limited marginal vegetation.
- 6.21 The rest of the Site comprises infrequent poor semi-improved and improved grasslands, and a mosaic of dry heath and acid grassland where these habitats merge. Bracken and plantation woodland were recorded around the edges of the Site and drystone walls are a common feature marking field boundaries in the northern part of the Site. There are several narrow gullies at the outer edges of the site, which develop into small watercourses further downslope. The sections within and immediately adjacent to the Site boundary held no running water at the time of survey. The vegetation composition of these habitats does not correspond to any priority habitat descriptions.
- 6.22 No non-native invasive species were recorded.

Protected species

- 6.23 The Phase 1 habitat survey and desk study returned the following data on protected species:

⁷ which is limited to the H5 and M14-16 NVC communities

- a. Fourteen records of badger *Meles meles* largely attributed to areas of woodland surrounding the Site to the south and west, and farmland on the edge of Cwmbran to the east. No setts or other evidence were identified during the extended Phase 1 habitat survey. Most of the habitats present provide suitable foraging resources for badger, and woodland at the edges of the Site offer sufficient cover for sett building. Construction phase mitigation measures will need to be included to ensure legislative compliance with regard to badger, but detailed assessment will not be completed.
- b. There were no bat records returned from within the Site boundary, but a large number of records (>3000) from thirteen species were returned within 10 km of the site. The exposed higher ground within the Site is likely to be of limited value for bats, but the surrounding slopes are generally more sheltered and contain woodland, watercourses, mature trees and acid flushes, which are likely to offer good foraging and commuting habitat. The derelict building at TN4 has low potential roost features (PRF), such as gaps under the door lintels which could support low numbers of bats. No bats were recorded using these features during an emergence survey in June 2021. Potential impacts on bats during construction and operational phases will be subject to detailed assessment.
- c. Two records of dormouse *Muscardinus avellanarius* were returned within 2 km of the Site (850 m from south-western boundary in plantation around Cwm Gwyddon, and 1.7 km from south boundary in woodland near Twmbarlwm). Habitats on the high ground and slopes of the common are unsuitable for dormice, consisting of open grassland, heath and bracken. Plantation woodland at the fringes of the Site is suitable, albeit suboptimal, habitat for this species, and has connectivity to areas of broadleaved woodland in the wider landscape which are likely to provide more suitable habitat. There is no requirement for removal of broad-leaved woodland which could support dormouse, and no impact is anticipated. Therefore, impacts on dormouse can be scoped out of the detailed assessment.
- d. SEWBRc holds ten records of great crested newt *Triturus cristatus* within 2 km of the Site, including records from ponds within the Site boundary (ponds 2, 3 and 4, Appendix 5 'Pond locations'). The most recent of these dates from April 2019 and is attributed to pond 3. The eDNA survey returned a negative result for five ponds sampled within the Site boundary in early June 2020 (those that held enough water were sampled). In 2021, eDNA surveys were repeated in mid-April (when 10 of the ponds held water). Ponds 1 and 3 returned a positive result for GCN, the rest were negative. Ponds 1, 2 and 3 were subsequently surveyed (by torch, terrestrial search, net, bottle trap and egg searching). GCN were recorded breeding in Pond 1 and 2, a juvenile GCN was recorded during terrestrial searches adjacent to Pond 3 on two visits. The combined peak count of GCN for the three ponds was 16 individuals. Potential impacts on GCN will be subject to detailed assessment.
- e. Fourteen records of reptiles were returned within 2 km of the Site. This includes records of slow worm *Anguis fragilis*, common lizard *Zootoca vivipara*, adder *Vipera berus* and grass snake *Natrix helvetica*. The mosaic of habitats within the Site are likely to support widespread species of reptile including slow worm, common lizard, and adder, particularly where vegetation or

ground is less homogeneous in structure. Construction phase mitigation measures will need to be included to ensure legislative compliance with regard to reptiles, but detailed assessment will not be completed.

- f. Nine records of otter *Lutra lutra* was returned within 2 km of the Site. There are no watercourses within the Site, but several streams originate close to the boundary on the surrounding slopes. At their upper reaches these typically offer suboptimal habitat for otter, with limited opportunities for foraging and shelter. Further survey will be completed, but it is unlikely otter will be subject to detailed assessment.*
- g. A single record of water vole *Arvicola amphibius* was returned within 2 km of the Site. The watercourses within the Site are unsuitable for water vole given the lack of marginal vegetation along their upper reaches. Further survey will be completed, but it is unlikely water vole will be subject to detailed assessment.*
- h. No records of Silurian moth were returned within 2 km of the Site. Martin Anthoney (Torfaen moth recorder) confirmed that Silurian moth has not been recorded in the Mynydd Maen area, despite survey work being previously completed as part of a CCW contract in 1996. A 2018 report (Tordof and Williams, 2018), suggests that whilst "The mobility of Silurian adults is largely unknown. Males will clearly wander several kilometres from breeding habitat, even entering light traps in lowland gardens, but very few females have been trapped even in breeding areas.... Female Silurian are particularly heavy-bodied when gravid and their ability to disperse between sites, enabling colonisation of new mountains, would appear to be limited." It is therefore unlikely that Silurian moth is present on site, and as extent of impacts on bilberry dominant habit during the development is limited, detailed assessment of impacts on Silurian moth will not be completed.*

Approach

- 6.24 The approach to the collection of baseline ecological data has been and will be based on industry standard guidance wherever this is available and applicable to the site. For example, the Phase 1 habitat survey has been undertaken in accordance with Joint Nature Conservation Committee (JNCC) (2010) guidelines.
- 6.25 Particular consideration has been given to habitats and species listed under Annexes 1 and 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, Schedules 5, 8 and 9 of the Wildlife and Countryside Act 1981 (as amended), and Section 7 of the Environment Wales Act (2016) in deriving the proposed approach to further work.
- 6.26 A qualitative and quantitative ecological impact assessment will be undertaken, following the principles set out in the CIEEM publication 'Guidelines for Ecological Impact Assessment in the UK and Ireland', and will include an assessment of cumulative effects, details of appropriate mitigation measures and details of any residual effects (should any exist following mitigation).

Further survey

6.27 Further survey will be completed for bats, otter and water vole. Details of survey methods are given below:

- a. Industry standard guidance (SNH et al., 2019) guidance recommends that static bat detectors are deployed at all turbine locations at wind farms of ten turbines or less. It is otherwise left to the professional judgement of the consultant to advise what complementary bat surveys are appropriate based on the characteristics of the site. For Mynydd Maen twelve static acoustic detectors will be deployed at potential turbine locations (based on topography / initial designs or constraints mapping if available) for a minimum of ten nights during spring, summer and autumn. SM4 full spectrum detectors will be used. Weather data will also be collected. No other survey is considered appropriate at this time.*
- b. Survey methods for otter will be based on those recommended in Chanin (2003). Streams (channels and banks) will be systematically surveyed for signs of otter such as droppings ('spraints'), runs and footprints. Particular attention will be given to suitable sprainting areas such as large, flat rocks or areas where otters were likely to leave streams. Surveys will cover an area of 200 m around wind farm infrastructure.*
- c. Survey for water vole will be completed in conjunction with otter survey. Survey will be completed in line with industry standard guidance (Dean et al., 2016), with surveyors searching for field signs along watercourses within 200 m of site infrastructure on two occasions (between mid-April and June, and July and September respectively).*

Summary

6.28 Consideration will be given to the following potential effects:

- Construction
 - Temporary Land-take;
 - Disturbance (visual, noise);
 - Hydrology and pollution (dust generation, pollution of aquatic habitats);
 - Lighting (construction); and
 - Construction site hazards.
- Operation
 - Permanent Land-take;
 - Effects on bats – collision

- Hydrology;
- Permanent Lighting; and
- Visitor pressure (disturbance / trampling) to locally designated sites.

6.29 Table 4 provides a summary of the key issues to be considered in relation to biodiversity.

Table 4: Biodiversity Effects

Receptor	Effects	Scoped In
Statutory Protected Sites	<ul style="list-style-type: none"> • Land-take • Disturbance (visual, noise) • Hydrology and pollution (dust generation, pollution of aquatic habitats) • Lighting • Construction site hazards • Effects on bats – collision • Visitor pressure 	X
Non-statutory Protected Sites		✓
Dry Heath		✓
Badger		Compliance only
Bats		✓
Dormouse		X
Great crested newts		✓
Reptiles		Compliance only

References

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7 ORNITHOLOGY

- 7.1 This section has been written by BSG Ecology and sets out the proposed approach to assessing the potential Ornithological effects of Mynydd Maen Wind Farm. For the purposes of ornithological survey and assessment work the site and the survey area are contiguous and are indicated by the red line in **Appendix 6** 'Site layout, VP locations and viewsheds'.
- 7.2 Ecological effects are considered in Section 6.

Baseline

Desk-based review

- 7.3 Biological records and information on statutory and non-statutory designated sites were provided by South East Wales Biodiversity Records Centre (SEWBReC). A 2 km perimeter search area around the Site is considered sufficient to cover core ranging areas of those target species likely to occur within the region around their nest sites (SNH, 2017). The National Biodiversity Network (NBN) Gateway was also reviewed for publicly accessible biological records relating to birds within 2 km of the Site.

Consultation

- 7.4 Consultation meetings have been held with County Ecologists from TCBC and CCBC on 28 April 2021 and 13 May 2021 respectively. Ecologists from both councils suggested that they were happy with the scope of the ecological survey to date. It was agreed that a second year of consultation, with both TCBC and CCBC present at meetings, would be beneficial, particularly to discuss mitigation and enhancement opportunities in order to deliver a net benefit for biodiversity in line with Policy 18 of Future Wales.
- 7.5 Several requests have been made to Natural Resources Wales (NRW) for a Discretionary Planning Advice Service (DPAS) meeting to discuss the scope of baseline ecological work required to inform a planning application for the development. To date NRW have been unable to accommodate a meeting.

Survey methods

- 7.6 This section provided the methods for the first year of ornithological survey (2020/21), details of survey included in the second year are included in the 'further survey' section.

7.7 Vantage Point (VP) survey methods are given below:

- a. *Vantage Point (VP) surveys were conducted during the 2020 breeding season (April to July inclusive) and winter season (October to March inclusive). The same VP locations have been used during both seasons.*
- b. *Three VP locations were selected to obtain maximum visual coverage of the proposed turbine locations and a suitable perimeter around them. VP locations and viewsheds (modelled in ArcGIS) are shown on **Appendix 6** 'Site layout, VP locations and viewsheds'. The VP viewsheds were scanned constantly until a target species was detected. The flight line and height of the bird was then recorded until it landed or was lost from view.*
- c. *Target species included all Schedule 1 of the Wildlife and Countryside Act, 1981 (as amended) and Annex 1 of Directive 2009/147/EC (often referred to as The Birds Directive) raptors and owls, all waders and all migratory wildfowl. Information on other non-focal species (passerines, ubiquitous and naturalised species) was aggregated and summarised in five minute intervals on the reverse of the VP recording form.*
- d. *A total of 36 hours of survey was completed at each VP location between April and July 2020 inclusive and between October 2020 and March 2021 inclusive.*

7.8 Breeding raptor survey area is shown on **Appendix 7** 'walkover survey areas, location of quarries, and nightjar survey stop points' and methods are given below:

- a. *SNH guidance (SNH, 2017) recommends that surveys for raptors including red kite *Milvus milvus* and peregrine *Falco peregrinus* are completed within 2 km of proposed wind farms. For goshawk *Accipiter gentilis* and hobby *Falco subbuteo*, which often nest in plantation woodland habitats, 1 km is recommended.*
- b. *Several areas of habitat within 1-2 km of the Site that have the potential to support one or more raptor species. These include:*
 - i. *Peregrine (2 km search area). Masts and pylons within the Site, and various disused quarries (such as Hafod Fach Quarry), and the rock escarpment above Penyrheol.*
 - ii. *Red kite (2 km). Mature mixed and coniferous woodland in the adjacent Cwm y Glyn, Cwmcarn and Gwyddon Valleys, and on the slopes above Cwmbran.*
 - iii. *Hobby (1 km). Plantation woodland in the adjacent Cwm y Glyn, Cwmcarn and Gwyddon Valleys, and in more open habitats with scattered trees and small woods to the west, north-west and east.*
 - iv. *Kestrel *Falco tinnunculus* (no specified search area in guidance: taken as 1 km). Buildings at the radio mast complex, a derelict building, masts and pylons on Site, and quarries and mature trees off site.*
- c. *Surveys of potential breeding areas were completed during three visits (per identified area) using a combination of walkover raptor survey and mobile VPs between April and July inclusive. The survey methods were based on recommendations in SNH (2017) guidance and Hardey et al. (2013). The duration of supplementary VP watches were varied by location depending on the extent to which viewsheds covered the areas in question.*

7.9 Breeding wader survey area is shown on **Appendix 7** 'walkover survey areas, location of quarries, and nightjar survey stop points' and methods are given below:

- a. Walkover breeding wader surveys of the moorland habitats extended to approximately 800 m beyond the indicative turbine locations.*
- b. The Brown & Shepherd (1993) method was applied, but surveys were repeated on four occasions (based on recommendations set out in Calladine et al. (2009)) between mid-April and mid-July (with at least seven days between visits). Moorland areas were walked whilst applying a constant search effort for upland waders. The surveyor covered between 250 and 300 ha per day, and all parts of the survey area approached to within approximately 100 m. Frequent stops were made at local viewpoints in order to listen for singing and calling birds and to scan areas around the observer. In addition to records from the breeding wader surveys, any evidence of waders during VP work was systematically recorded.*

7.10 Nightjar survey area is shown on **Appendix 7** 'walkover survey areas, location of quarries, and nightjar survey stop points' and methods are given below:

- a. all areas of potential nightjar breeding habitat within the site and additional suitable habitat within 500 metres of proposed turbine locations have been identified from aerial photography and felling plans, and ground-truthed during site visits. Surveys to locate 'churring' males (which indicate territories) following the industry standard method described by Gilbert et al (1998) were completed in June and July 2020.*

Statutory sites

7.11 There are no statutory designated sites within 2 km of the Site. The nearest internationally designated site is the River Severn Special Protection Area (SPA) and Ramsar site, located approximately 12.5 km south of Mynydd Maen. There is one Site of Special Scientific Interest (SSSI) within 2 km of the Site; Ty'r Hen Forwyn approximately 1.4 km to the north-west. The SSSI is not notified for its ornithological interest. Llandegfedd Reservoir SSSI is located approximately 4.6 km to the east of the Site, and is notified for its population of wintering waterfowl.

Non-statutory sites

7.12 There are 57 Sites of Importance for Nature Conservation (SINC) within 2 km. Details of the SINC are given in Section 5. None of the SINC are within or adjacent to the Site cite ornithological interest as the reason for their designation.

Desk study data

- 7.13 SEWBRc returned twenty records for eight species of Schedule 1 Birds within 2 km of the Site: red kite, osprey *Pandion haliaetus*, goshawk, peregrine, hobby, brambling *Fringilla montifringilla*, kingfisher *Alcedo atthis* and common crossbill *Loxia curvirostra*. Two of these indicate local breeding; the goshawk record was of an adult male and juvenile noted in July and one common crossbill record was of a nest with eggs.
- 7.14 There were also two nightjar records one in each of July 2010 and July 2012. The nearest record being within an area of plantation approximately 1.2 km south-west of the Site.

Breeding bird season survey

- 7.15 A combined total of 108 hours of VP survey was completed between April and July 2020 inclusive. Target species recorded during the breeding VP survey work were; hobby, red kite, kestrel, goshawk, and peregrine. The results of VP surveys were as follows:
- a. *Hobby: four flights were recorded over the Site and adjacent areas. All involved single birds soaring or making hunting flights.*
 - b. *Red kite: Twenty two flights were recorded over the Site and adjacent areas. All flights involved single birds making commuting or foraging flights, with the exception of flights on each of 27 May and 09 July, involving two birds.*
 - c. *Kestrel: 113 flights were recorded over the Site and adjacent areas, particularly the Cwmsychan Valley and over Mynydd Coety. Flights were distributed over moorland habitats within the VP viewsheds, with concentrations of activity over Twyn Calch (34 flights) and Mynydd Twyn-glas (20 flights). Two birds were recorded in flight concurrently on four dates: 11 May (2 flights), 08 June, 09 June and 06 July (2 flights). All other observations were of single birds. More than one flight was recorded per watch on 21 occasions; with up to 10 flights noted on 09 July involving both male and female birds.*
 - d. *Goshawk: Six flights were recorded over five dates (two flights in each of April, June and July). The majority of flights were over plantation woodland outside the Site.*
 - e. *Peregrine: eight flights were recorded within and adjacent to the Site boundary, mostly at the northern boundary of the Site near Mynydd Llwyd, and around the masts at the centre of the Site. All flights involved single birds.*

Breeding raptor surveys

- 7.16 A cumulative total of approximately 28 hours of breeding raptor survey work and 34 hours of upland wader survey was completed between April and July 2020 inclusive.

- 7.17 A peregrine eagle was located approximately 500 m from the Site⁸.
- 7.18 A disused kestrel nest was recorded at a quarry site, approximately 550 m east of the Site, during a survey on 22 April. Subsequent watches of the site, and other local quarry sites on 21 May, 01 June, 01 July and 02 July did not record any evidence of active nests.
- 7.19 No evidence of breeding hobby was recorded during the work.
- 7.20 No other evidence that indicates raptors are nesting locally was recorded.
- 7.21 No waders were recorded during breeding wader surveys or other breeding season work, with the exception of two snipe that were flushed in April 2020 (likely to have been on spring passage).

Nightjar survey

- 7.22 A maximum count of 13 territories were recorded during the nightjar survey work in 2020⁹.

Incidental records

- 7.23 Short-eared owl *Asio flammeus* was recorded on Site during upland wader survey walkover on 07 May within the northern part of the Site near Mynydd Llwyd. A bird was recorded incidentally by a surveyor walking to a VP location in the same area on 27 May. [REDACTED]
[REDACTED] Following the sightings the timings of some VPs were adjusted to ensure surveyors were on site during crepuscular hours when the species is more likely to be seen. There were no further records.
- 7.24 A long-eared owl *Asio otus* juvenile begging call was heard [REDACTED]
[REDACTED] during nightjar survey on 16 June. [REDACTED]

⁸ Details on exact location have not been provided due to potential for persecution but can be provided on request.

⁹ Territory locations can be provided on request.

Winter season survey

7.25 A combined total of 108 hours of VP survey was completed between October and March 2020/21 inclusive. Target species recorded during the breeding VP survey work were: red kite, kestrel, goshawk, kittiwake *Rissa tridactyla*, hen harrier *Circus cyaneus* and peregrine. The results of VP surveys were as follows:

- a. *Red kite*: Sixteen red kite flights were recorded during the winter surveys. All flights involved single birds. Activity was most frequently recorded over Mynydd Lwyd in the northern part of the Site.
- b. *Kestrel*: Kestrel was the most frequently recorded target species during the winter VP survey work. Sixty-nine kestrel flights were recorded during the winter surveys. Flights were distributed over moorland habitats within the VP viewsheds, with concentrations of activity over land to the south of Mynydd Lwyd and over Twyn Calch. Two birds were recorded in flight concurrently on 07 January 2021. All other observations were of single birds.
- c. *Goshawk*: Ten goshawk flights were recorded during the winter surveys. All flights involved single birds, and activity was most frequently recorded over plantation woodland to the west of the Site. Three flights were of unsexed adult birds, two were of adult females, two were of first year birds and three were of unaged and unsexed birds. A brief display flight was recorded over plantation woodland to the west of the Site on 31 March 2021.
- d. *Kittiwake*: A first winter kittiwake was recorded in flight during the winter VP2 survey on 08 February 2021. The bird circled up from Cwm Lleucu and then flew directly south-west.¹⁰
- e. *Hen harrier*: Five flights of hen harrier were recorded during the work; two flights on 26 October 2020, one flight on 06 November 2020 and two flights on 23 November 2020. All flights were made by single birds flying low over heathland in the north and central parts of the Site, over Cwm Lleucu, Twyn Calch and Mynydd Maen.
- f. *Peregrine*: Fourteen peregrine flights were recorded during the winter surveys. Activity was concentrated at the northern and western boundaries of the Site and over Mynydd Llwyd, and around the masts at the centre of the Site. Two flights involved two birds recorded together. An adult male and adult female were soaring together over the valley on the western Site boundary on 25 February 2021. An unsexed bird flying north-east over the Site before joining a second bird on 05 March 2021. All other flights involved single birds.

Non focal species

7.26 Non-focal species recorded during the survey work included red grouse *Lagopus lagopus*, snipe *Gallinago gallinago*, buzzard *Buteo buteo*, sparrowhawk *Accipiter nisus*, lesser black-backed gull *Larus fuscus*, herring gull *Larus argentatus*, cormorant *Phalacrocorax carbo*, grey

¹⁰ This record was unexpected, so the bird was photographed whilst on site.

heron *Ardea cinerea*, carrion crow *Corvus corone*, raven *Corvus corax*, and cuckoo.

- 7.27 Buzzard were the most regularly recorded species on 58 of the 72 VP watches. Raven was noted on 51 watches and carrion crow was noted on 45 watches.
- 7.28 Red grouse were recorded on 10 dates during VP watches during 2020-21 surveys. Observations were most frequent in the northern part of the Site.
- 7.29 Gulls were recorded during 31 watches, with a maximum count of 71 herring gull on 12 December 2020 (feeding / loafing over Hafod-yr-Ynys valley beyond the north-western boundary of the Site). Flights by gulls were typically observed over valleys south and north of the Site.
- 7.30 The breeding passerine community is typical of the upland moorland habitats present within the Site and dominated by Skylark *Alauda arvensis* and meadow pipit *Anthus pratensis* were the most frequently noted passerines. Stonechat *Saxicola rubicola*, whinchat *Saxicola rubetra* and wheatear *Oenanthe oenanthe* present in low numbers. Widespread and ubiquitous species were recorded in the stream valleys. Passerine species recorded during the winter VP work only were common crossbill *Loxia curvirostra*, fieldfare *Turdus pilaris*, redwing *Turdus iliacus* and linnet *Linaria cannabina*.

Further survey

- 7.31 Ornithological work undertaken during the breeding season of 2021 and the winter of 2021/22 will reprise and extend the work completed in the breeding season of 2020 and winter of 2020/21. The following will be completed:
- a. *Vantage point (VP) surveys based on SNH (2017) guidance: 36 hours of survey work at each of 3 VPs during both the 2021 breeding season and the winter of 2021/22 season.*
 - b. *Breeding raptor survey (goshawk survey is considered separately below): surveys for moorland and forest-nesting raptors following methods outlined in Hardey et al (2013) will be completed in 2021. A series of walkover surveys (incorporating watches from additional ad hoc VPs) are being undertaken under licence to confirm territory locations and to gain a clear indication of breeding success for raptors encountered.*
 - c. *Goshawk survey: Flights were recorded over adjacent plantation woodland to the north and west of the site in 2020; both areas comprise potentially suitable breeding habitats. Three VP locations have been identified that overlook this habitat. Three days of focussed survey for goshawk were completed in early spring 2021 (one day in February, and two in March) to complement the more generic raptor survey above. Results will be interpreted at the end of the breeding season and included in year 2 reporting.*

d. Nightjar survey: all areas of potential nightjar breeding habitat within the site and additional suitable habitat within 500 metres of proposed turbine locations have been identified from aerial photography and felling plans, and ground-truthed during site visits. Surveys to locate 'churring' males (which indicate territories) will follow the industry standard method described by Gilbert et al (1998). Two visits will be completed to record nightjars between late May and mid-July in 2021.

- 7.32 A second year of wader surveys will not be completed, as there have been no records of waders using the site (with the exception of wintering / passage common snipe) and targeted survey is considered to be disproportionate to likely impacts. Should waders be recorded in 2021 we would review the need for targeted survey. Local authority ecologists agreed with this approach.

Approach

- 7.33 A qualitative and quantitative ecological impact assessment will be undertaken, following the principles set out in the CIEEM publication 'Guidelines for Ecological Impact Assessment in the UK and Ireland', and will include an assessment of cumulative effects, details of appropriate mitigation measures and details of any residual effects (should any exist following mitigation).
- 7.34 The ornithological impact assessment (OIA) will assess the likely effects of construction, operation and decommissioning of a wind farm at the proposed Mynydd Maen Wind Farm on ornithological receptors. The OIA will be informed by Collision Risk Modelling to determine indicative likelihood of collision of target species. The key consideration within the ornithological impact assessment (OIA) is likely to be disturbance (leading to displacement) and collision of raptors during the construction and operation of the wind farm.

Summary

- 7.35 Consideration will be given to the following potential effects:

- Construction
 - Temporary Land-take;
 - Disturbance (visual, noise);
 - Lighting (construction); and
 - Construction site hazards.
- Operation
 - Permanent Land-take;

- Effects on birds – collision;
- Permanent Lighting; and
- Visitor pressure (disturbance / trampling) to locally designated sites.

7.36 Table 5 provides a summary of the key issues to be considered in relation to ornithology.

Table 5: Ornithology Effects

Receptor	Effects	Scoped In
Statutory Protected Sites	<ul style="list-style-type: none"> • Land-take • Disturbance (visual, noise) • Lighting • Construction site hazards • Effects on birds – collision • Visitor pressure 	X
Hobby		✓
Red kite		✓
Kestrel		✓
Hen harrier		✓
Goshawk		✓
Peregrine		✓
Red grouse		✓
Nightjar		✓
Waders		X
Owls		X
Breeding passerines		Compliance / potential enhancement only

References

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- Calladine, J., Garner, G., Wernham, C. & Thiel, A. (2009) *The influence of survey frequency on population estimates of moorland breeding birds*. Bird Study, 56: 3, 381-388.
- Hardey, J., Crick, H., Riley, H., Etheridge, B., and Thompson, D. (2013). *Raptors: A field guide to surveys and monitoring*. The Stationery Office; 3rd revised edition.
- Gilbert, G., Gibbons, D.W & Evans, J. (1998). Bird monitoring methods. RSPB, Sandy.
- Scottish Natural Heritage (2017). *Recommended bird survey methods to inform impact assessment of onshore wind farms*. Scottish Natural Heritage, Inverness.

8 CULTURAL HERITAGE

- 8.1 This chapter will consider the effects of the proposed development on cultural heritage assets.
- 8.2 A heritage asset may include archaeological remains and components of the historic landscape such as scheduled monuments or listed buildings and conservation areas, non-designated buildings identified as part of a 'local list' maintained by the local planning authority or other physical or intangible components of the environment that contribute to the character or significance of a place in heritage terms.
- 8.3 The Chapter will identify heritage assets with the potential to be affected by the proposed development and assess the likely significance of impact on these receptors following mitigation measures.

Baseline

- 8.4 A desk-based assessment of the heritage baseline will be undertaken, and will consider the following sites within a 10km radius from the centre of the site:
- Sites on the Register of Landscapes of Outstanding and of Special Interest in Wales;
 - Listed buildings;
 - Scheduled Monuments;
 - World Heritage Sites; and
 - Registered Parks and Gardens of Special Historic Interest in Wales.
- 8.5 In addition, the assessment will consider archaeological remains on Site and within a 500m radius of the Site.
- 8.6 The site is not located within a Registered Landscape of Outstanding and of Special Interest in Wales. The Blaenavon Industrial Landscape World Heritage Site is situated approximately 10km north of the site. There are a number of scheduled monuments, including Twm-Barlwm Mound and Bailey Caste within 5km of the site.

Approach

- 8.7 The objectives of the assessment are to:
- Identify all recorded heritage assets within the agreed study area (as set out above) with

the potential to be significantly affected by the proposed development;

- Describe the sensitivity of the identified heritage assets by appraising their value and the contribution of setting to that significance;
- Identify the magnitude of impact on the significance of relevant heritage assets arising from the proposed development;
- Identify mitigation to avoid or minimise adverse impacts, where possible;
- Assess the proposed development's effects on the value of heritage assets, including taking into consideration any mitigation proposed when assessing the significance of the proposed development's residual effects; and
- Assess the cumulative effects of the proposed development in conjunction with other committed developments.

8.8 The assessment will be guided by best practice guidelines at a national and local level, including Cadw's Conservation Principles for the sustainable management of the historic environment in Wales, which are:

- Historic assets will be managed to sustain their values;
- Understanding the significance of historic assets is vital;
- The historic environment is a shared resource;
- Everyone will be able to participate in sustaining the historic environment;
- Decisions about change must be reasonable, transparent and consistent; and
- Documenting and learning from decisions is essential.

8.9 Heritage assets will be scoped into both construction and operational stages of the assessment.

8.10 The likely temporary construction effects on built heritage assets, being short to medium-term, are therefore likely to be less significant than the permanent effects. Construction effects are likely to affect the setting of heritage assets outside the application site. Measures proposed to prevent, reduce or where possible offset any significant adverse effects will be identified and developed as part of the design process and identified within the report. The design mitigation is likely to include careful planning, the siting, access, layout and scale of any necessary buildings, at each project phase.

8.11 There is potential for indirect effects during the operational phase on the setting of all heritage assets within the 1km study area. For those assets that will be affected, the effects will be appraised in terms of changes (if any) caused to their setting. Appropriate assessment of cumulative impacts, suitable mitigation and consequently residual impacts will be provided.

Summary

8.12 Table 6 summarises the built heritage effects identified for inclusion in the assessment.

Table 6: Built Heritage Effects

Receptor	Effects	Scoped In
Sites on the Register of Landscapes of Outstanding and of Special Interest in Wales	Alteration of Setting	✓
Scheduled Monuments	Direct impacts (construction only), Alteration of Setting	✓
Listed Buildings	Alteration of Setting	✓
Blaenavon Industrial Landscape World Heritage Sites	Alteration of Setting	✓
Registered Parks and Gardens of Special Historic Interest in Wales	Alteration of Setting	✓
Below ground archaeology	Direct impacts (construction only)	✓

9 TRANSPORT AND ACCESS

- 9.1 An assessment will be undertaken of the likely significant effects of the proposed development on the environment with respect to transport and access, considering the construction phase of the development.
- 9.2 The traffic and transport assessment will only cover the construction phase of the project. Once operational there will be negligible traffic associated with the site apart from occasional maintenance vehicles, and following the operational phase the site is expected to be decommissioned. Traffic associated with decommissioning would include HGVs, LGVs, abnormal loads and private cars. The number of vehicle trips associated with decommissioning would be significantly less than those associated with construction.
- 9.3 At this stage it is not possible to quantify decommissioning traffic volumes as the precedent for decommissioning has not yet been established. It is also not possible to quantify the effect of decommissioning traffic as the baseline conditions will change over the planning permission period. Traffic and transport impacts and effects associated with operation and decommissioning will therefore not be addressed within the EIA.
- 9.4 Data used in the assessment will be drawn from the Transport Assessment (TA). The TA will provide a detailed assessment of the traffic impact and road safety implications of the proposals and identify measures to mitigate the impact of the development, it will present access arrangements and describe measures to provide access by all modes of transport. A Traffic Management Plan (TMP) will also be provided in support of the planning application.

Baseline

- 9.5 Traffic data and, where appropriate, traffic surveys and modelling will be undertaken to inform the assessment within a defined study area to be agreed with consultees. This transport data will also be used to provide information to determine the baseline for assessment within the EIA.
- 9.6 The assessment will consider a future baseline that will include consideration of the growth in travel demand, including any changes arising from other developments or potential transport network improvements.

Approach

- 9.7 The traffic and transport impact of the proposed development will be assessed in line with guidance contained in the DfT publication 'Guidance on Transport Assessment' (March 2007) and The Institute of Environmental Assessment (now IEMA) Guidelines for the Environmental Assessment of Road Traffic (1993).
- 9.8 The extent of transport impact will be determined using pre-defined significance criteria for each mode of travel. Those criteria will be based on the net change in journeys as a result of the development of the site and any infrastructure improvements delivered as part of the proposals. The significance criteria will establish the magnitude of any beneficial or adverse effects the proposed development will have on the transport network.
- 9.9 The scope of the assessment will be agreed with all relevant local county borough councils, Welsh Government Highways – South (WGHS), and South Wales Trunk Road Agent (SWTRA). The scope is likely to include the following study areas along the route between the proposed (PoE), the Port of Swansea, and the site:
- Egress from the Port of Swansea onto the A483;
 - A483, exiting at junction 42;
 - M4, exiting at junction 28;
 - A467, exiting on Central Avenue;
 - Old Pant Road, and;
 - Pant Road.
- 9.10 The following topics will be assessed for the construction phase:
- Driver severance and delay;
 - Pedestrian severance and delay;
 - Pedestrian amenity;
 - Accidents and safety; and
 - Hazardous and dangerous loads.

Summary

- 9.11 Table 7 summarises the transport and access effects identified for inclusion in the assessment.

Table 7: Transport and Access Effects

Receptor	Effects	Scoped In
Local network road	Driver severance and delay;	✓
	Pedestrian severance and delay	✓
	Pedestrian amenity	✓
	Accidents and safety	✓
	Hazardous and dangerous loads	✓

10 NOISE

- 10.1 An assessment of potential effects of the proposed development with respect to noise and vibration will be undertaken. This will include construction phase (temporary) and operational phase (permanent) effects.

Baseline

- 10.2 The noise character of the area is expected to be typical of a rural environment and consist of wind generated noise along with noise from traffic, farm machinery, birds and the occasional overhead aircraft. Baseline data has not yet been gathered but it is expected that background noise measurements will be necessary at locations to be agreed with the Environmental Health Department.

Approach

- 10.3 The effects of noise during the construction phase will be assessed in accordance with the British Standard 5228-1:2009+A1:2014 '*Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise*'. Noise due to construction traffic shall also be considered in this assessment.
- 10.4 Operational noise emitted by wind turbines can be associated with two types of noise source: aerodynamic sources due to the passage of air over the turbine blades; and mechanical sources associated with the gearbox, generator and other parts of the drive train.
- 10.5 Operational noise shall be assessed in accordance with ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms', and the Good Practice Guide to its application issued by the Institute of Acoustics in 2013. The proposed methodology is consistent with Planning Policy Wales and Technical Advice Note 11: Noise.
- 10.6 In accordance with the recommendations of ETSU-R-97, the acceptability of the acoustic impact of a proposed wind farm is established by comparing the noise levels predicted to be produced during operation with appropriate noise limits at nearby residential properties.
- 10.7 ETSU-R-97 states that background noise surveys would be unnecessary if wind farm noise levels are limited to 35 dB(A) as this is likely to offer sufficient protection of amenity. Otherwise noise limits are set relative to the existing background noise level (to reflect the variation in background noise with wind speed) except for low background noise levels, where a fixed limit is applicable. Initial assessments indicate that a background noise survey is likely to be required to enable the noise limits to be derived.

- 10.8 ETSU-R-97 states that for groups of properties that are likely to have a similar background noise environment, it is appropriate to infer the background noise data measured at a representative location to the other properties.
- 10.9 Consultation with the Environmental Health Department shall be undertaken to agree the number and location of baseline survey locations.
- 10.10 The daytime lower fixed limit should be between 35 and 40dB(A) according to ETSU-R-97 with the choice depending upon the trade-off between the benefits of the scheme in terms of meeting national renewable energy targets vs the impact of the scheme on local residential amenity i.e. a large scheme with the small impact would be able to justify a 40dB(A) limit.
- 10.11 Consultation with the Environmental Health Department shall be undertaken to agree an appropriate daytime lower fixed limit.
- 10.12 A cumulative operational noise assessment shall be undertaken should cumulative effects be identified.

Summary

- 10.13 Table 8 summarises the noise and vibration effects to be included for detailed assessment in the ES.

Table 8: Noise Effects

Receptor	Effects	Scoped In
Existing residential receptors and community uses	Temporary noise effects during construction, and need for control/mitigation measures.	✓
Proposed use, aerodynamic and mechanical sources	Compliance with relevant external noise standards.	✓

11 SHADOW FLICKER

- 11.1 An assessment will be undertaken of the likely significant effects of the proposed development on shadow flicker.

Baseline

- 11.2 Shadow flicker is an effect that can occur within buildings situated in relatively close proximity to wind turbines when the shadow from rotating blades passes over a window opening. Shadow flicker intensity is defined as the difference or variation in brightness at a given location in the presence and absence of a shadow. Shadow flicker can be a nuisance to nearby human receptors, and its effects therefore must be considered during the design of the proposed development. It only occurs when the turbine is in operation (i.e. sufficient wind speed is present), the sun is low in the sky (dawn, dusk, winter days), there is limited cloud cover, and the turbine lies between the direction of the sun and the building in question.

Methodology

- 11.3 There is no guidance on shadow flicker in Welsh planning policy, however, the Update to Shadow Flicker Evidence Base (2011)¹¹ published by the Department for Energy and Climate Change (DECC) (now part of the Department for Business, Energy and Industrial Strategy) states that assessing shadow flicker effects within ten times the rotor diameter of a wind turbine has been widely accepted across different European countries, and is deemed to be an appropriate area. The study area will therefore encompass all of the properties located within ten times the maximum rotor diameter, in this case, 1360m.

Approach

- 11.4 For an accurate assessment of shadow flicker, complex modelling is required taking into account the turbine's dimensions and the movement of the sun throughout the year. Data will be input into the modelling as follows:
- The locations of properties within ten rotor diameters of each proposed wind turbine;
 - The locations and dimensions of the proposed turbines;

¹¹ Update of UK Shadow Flicker Evidence Base (2011), prepared by Parsons Brinkerhoff on behalf of Department of Energy and Climate Change. The document can be found here: <https://www.gov.uk/government/publications/update-of-uk-shadow-flicker-evidence-base>

- The local topography (Ordnance Survey Digital Terrain Model); and
- The estimated dimensions of windows.

11.5 The modelling calculates the position of the sun throughout the day in accordance to the curvature of the earth, the time of year and the Site's position. The software calculates the occurrences of shadow flicker at each identified receptor. Analysis will be conducted to represent a worst case scenario, namely:

- The sun is shining all day, from sunrise to sunset;
- The rotor plane is always perpendicular to the line from the wind turbine to the sun;
- There are no obscuring features such as trees and vegetation;
- The analysis looks at shadow casting over the building from all directions rather than over vertical orientated windows only; and
- The wind turbine is always operating.

Summary

11.6 Table 9 summarises the likely effects on shadow flicker identified for inclusion in the assessment.

Table 9: Shadow Flicker Effects

Receptor	Effects	Scoped In
Nearby residential properties	Nuisance and disturbance to humans due to the operation of the turbine blades.	✓

12 CUMULATIVE EFFECTS

- 12.1 The ES will consider the potential for likely significant effects on the environment resulting from committed developments in the area.
- 12.2 As set out within Welsh Office Circular 11/99 'Environmental Impact Assessment' paragraph 46:

'Local planning authorities should always have regard to the possible cumulative effects with any existing or approved development'.

- 12.3 Furthermore, Policy 18 of Future Wales requires proposals for renewable and low carbon energy projects to consider the cumulative impacts of existing and consented renewable energy schemes. In terms of landscape impacts, as stated in Section 5 the site is located within a Pre-Assessed Area for Wind Energy, which has modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way. The development of the Pre-Assessed Areas took existing wind farms into account, and therefore the landscape has also been found capable of accommodating development from a cumulative perspective in an acceptable way.
- 12.4 Assessments will be quantitative where possible, and qualitative where not, based on professional judgement and reasonable assumptions. A full list of cumulative schemes to be assessed in the ES will be agreed with CCBC and TCBC. As part of the Scoping consultation, we seek confirmation from PEDW on the proposed developments to be considered in the cumulative assessment.

Consultation

- 12.5 The following statutory and other consultees will be consulted through the EIA process:
- Welsh Government;
 - Natural Resources Wales;
 - South and West Wales Wildlife Trust;
 - Cadw (the Welsh Government's historic environment service);
 - CCBC and TCBC (various departments); and
 - any other stakeholders that PEDW identify.
- 12.6 The feedback received through the consultation will be summarised in the ES and written up in full in the Consultation Report submitted in support of the DNS application.

13 ENVIRONMENTAL STATEMENT STRUCTURE

- 13.1 The ES will contain three main volumes and a Non-technical Summary, as set out in Table 10 below.

Table 10: Environmental Statement Structure

Volume 1: ES Main Text		
Chapter No.	Chapter Title	Description
1	Introduction	Introduction to the ES, EIA requirements, details of project team, ES organisation and availability.
2	EIA Methodology	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation.
3	Site and Development Description	Site description and details of the proposed development.
4	Alternatives and Design Evolution	Outline of the main alternatives considered by the Applicant.
5	Construction Methodology and Phasing	Details of anticipated programme for development and construction methodology.
6	Socio Economics	Assessment of the effects of the proposed development on socio economic issues.
7	Landscape and Views	Effects of the proposed development on landscape and visual amenity.
8	Ecology	Assessment of the effects of the proposed development on ecology at the site.
9	Ornithology	Assessment of the effects of the proposed development on ornithology at the site.
10	Cultural Heritage	Assessment of the effects of the proposed development with respect to built heritage receptors.
11	Transport and Access	Transport and access effects of the proposed development relating to driver severance and delay, pedestrian severance and delay, pedestrian amenity, accidents and safety and hazardous and dangerous loads.
12	Noise	Assessment of the effects of the proposed development relating to noise.
13	Shadow Flicker	Assessment of the effects of the proposed development on shadow flicker.
14	Summary and Residual Effects	Summary of the residual and interactive effects of the proposed development.
Volume 2		
Figures		Figures, plans and drawings to support the chapters in Volume 1.
Volume 3		
Technical Appendices		Technical data and reports to support the chapters in Volume 1.
Standalone Document		
Non-Technical Summary		Summary of the ES in non-technical language.

- 13.2 The first five chapters of the ES would be introductory and provide essential information for the subsequent technical chapters. Further information on these chapters is set out below.

Introduction

- 13.3 This chapter will provide background to the EIA, describe the structure of the ES and identify the project team. It will be supported by an appendix setting out the professional qualifications and experience of the contributors to the ES to comply with the EIA Regulations' requirement for "competent experts" to undertake EIA.

EIA Methodology

- 13.4 This chapter will set out the methodology used in the EIA, state the assumptions applicable to all disciplines, summarise the EIA Scoping process undertaken and summarise the public consultation process. Bespoke methodologies, limitations and assumptions will be contained in the technical chapters of the ES where required.
- 13.5 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the effects can be positive or negative. Generic criteria to be used in carrying out this process are detailed below. Some technical chapters will use discipline-specific criteria with their own terms for magnitude, sensitivity and significance. This will be explained in the relevant chapter.

Prediction of Impact Magnitude

- 13.6 The methodology for determining the scale or magnitude of impact is set out In Table 11 below.

Table 11: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for assessing impact
Major	Total loss or major/substantial alteration to key elements/features of the baseline (pre-development) conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

- 13.7 The sensitivity of a receptor is based on the relative importance of the receptor using the scale set out in Table 12 below.

Table 12: Methodology for Determining Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

Assessment of Effect Significance

- 13.8 Effect significance will be calculated using the matrix in Table 13. This illustrates the interaction between impact magnitude and receptor sensitivity.

Table 13: Effect Significance Matrix

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

Site and Development Description

- 13.9 This chapter will describe the setting of the site and the existing conditions on the site, as well as explaining the proposed development and setting out the development parameters. The parameter plans will be included as figures to the chapter.

Alternatives

- 13.10 This chapter would describe the evolution of the proposed development based on environmental constraints. It will include a high level comparison of the environmental effects of any alternatives studied by the Applicant.

Construction Methodology and Phasing

- 13.11 This chapter will outline the anticipated construction programme, phasing and methodology and explain the assumptions made. This chapter will form the basis of the construction phase

assumptions documented in each of the technical chapters of the ES.

Technical Assessments

13.12 Each ES chapter will follow the headings set out below to ensure the final document is transparent, consistent and accessible.

- Introduction;
- Planning Policy Context;
- Assessment Methodology;
- Baseline Conditions;
- Likely Significant Effects;
- Mitigation Measures;
- Residual Effects;
- Cumulative Effects; and
- Summary.

13.13 Each chapter sub-heading is explained in further detail in Table 14 below.

Table 14: Technical Chapter Format and Content

Sub-Heading	Content
Introduction	<ul style="list-style-type: none"> This section will introduce the assessment discipline and the purpose for which it is being undertaken.
Planning Policy Context	<ul style="list-style-type: none"> This section will include a summary of national, regional and local policies of relevance to the environmental discipline and assessment. Where applicable, relevant legislation will also be summarised.
Assessment Methodology	<ul style="list-style-type: none"> This section will provide an explanation of methods used in undertaking the technical study with reference to published standards, guidelines and best practice. The application of significance criteria will also be discussed. It will also outline any difficulties encountered in compiling the required information.
Baseline Conditions	<ul style="list-style-type: none"> This will include a description of the environment as it is currently (2021) and as it is expected to change given the project were not to proceed (i.e. 'do-nothing' scenario). The method used to obtain baseline information will be clearly identified. Baseline data will be collected in such a way that the importance of the particular subject area to be affected can be placed in its context and surroundings so that the effects of the proposed changes can be predicted.
Likely Significant Effects	<ul style="list-style-type: none"> This section will identify the likely significant effects on the environment resulting from the construction and operational phases of development.
Mitigation Measures	<ul style="list-style-type: none"> Adverse effects will be considered for mitigation and specific mitigation measures put forward, where practicable. Mitigation measures considered may include modification of the project, compensation and the provision of alternative solutions (including alternative technology) as well as pollution control, where appropriate. The extent of the mitigation measures and how these will be effective will be discussed. Where the effectiveness is uncertain or depends upon assumptions about operating procedures, data will be introduced to justify the acceptance of these assumptions. Clear details of when and how the mitigation measures will be carried out will

Sub-Heading	Content
	<p>be given. When certainty of impact magnitude and/or effectiveness of mitigation over time exists, monitoring programmes will be proposed to enable subsequent adjustment of mitigation measures, as necessary.</p> <ul style="list-style-type: none"> • The opportunity for enhancement measures will also be considered, where appropriate. • Information will be included on the mechanism by which the mitigation will be secured (e.g. by planning condition) with outline arrangements for monitoring and responsibilities for doing so, where necessary.
Residual Effects	<ul style="list-style-type: none"> • The residual effects, i.e. the effects of the proposed development assuming implementation of proposed mitigation, will be determined. The residual effects represent the overall likely significant effect of the development on the environment having taken account of practicable/available mitigation measures.
Cumulative Effects	<ul style="list-style-type: none"> • The cumulative effects of the proposed development and the identified committed developments will be assessed.
Summary	<ul style="list-style-type: none"> • A summary of the assessment and conclusions will be provided at the end of each technical chapter.

Summary and Residual Effects

- 13.14 The residual effects of the development will be summarised in one table at the end of the ES setting out the overall beneficial and adverse effects of the proposed development. This chapter will also set out any interactive effects that are likely to arise. These effects are defined as multiple effects on a single receptor. (e.g. noise and dust on a designated ecological site).