

UPPER LLIW ENERGY PROJECT

Request for Scoping Direction under Town and Country Planning
(Environmental Impact Assessment) (Wales) Regulations 2017

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1 INTRODUCTION

1.1 Introduction

- 1.1.1 This Scoping Report has been prepared by RPS on behalf of Cenin Renewables Ltd in relation to the application for the proposed Upper Lliw Energy Project at Land north of Felindre in the administrative area of Swansea Council.
- 1.1.2 Cenin Renewables Ltd proposes to submit an application for development consent to the Planning and Environment Decisions Wales (PEDW). The application will be accompanied by an Environmental Statement (ES) prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017, as amended (the EIA Regulations), and other required documents.
- 1.1.3 This Scoping Report sets out the proposed content, methodologies and key issues to be included within the Environmental Impact Assessment (EIA) process and the resulting ES to be submitted with the application. The purpose of this document is to obtain a Scoping Direction from PEDW (on behalf of the Welsh Ministers) and in doing so this Scoping Report provides information for statutory consultees and PEDW to agree the scope of the ES and what the Applicant intends to assess within the ES.

1.2 Statutory Framework and Purpose of the Environmental Statement

Statutory Framework

- 1.2.1 The indicative scale and size of the Proposed Development being greater than 10MW means the application will be classed as a Development of National Significance (DNS) to be determined by the Welsh Ministers and submitted to PEDW who appoint an Inspector to examine the application and make a recommendation to the Welsh Ministers based on the planning merits, national priorities and the benefits the Proposed Development is likely to bring if approved. The Welsh Ministers then decide whether or not to grant permission.
- 1.2.2 As stated in PEDW's DNS Procedural Guidance document (2019), the statutory basis for the Development of National Significance ('DNS') process is provided by the Planning (Wales) Act 2015, which amends the Town and County Planning Act 1990 ('the Act'), and the Developments of National Significance (Wales) Regulations 2016 (as amended) and subsequent Regulations. The purpose of the DNS process is to ensure timely decisions are made on those planning applications that are of the greatest significance to Wales, because of their potential benefits and impacts.
- 1.2.3 Environmental Impact Assessment (EIA) is not required for all developments. The Proposed Development falls within Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 ('the EIA Regulations') as an 'installation for the harnessing of wind power for energy production (wind farm)'. When screening Schedule 2 projects, account must be taken of the selection criteria in Schedule 3 of the EIA Regulations. Schedule 3 Paragraph (2)(1) of the regulations lists potentially environmentally sensitive geographical areas likely to be affected by development that should be considered 'in particular' when considering the need for EIA.

- 1.2.4 The Proposed Development may have significant effects on the environment by virtue of factors including its size, nature and location. Consequently, a Screening Direction has not been sought and instead it has been decided to proceed to Scoping the Environmental Statement ('ES') that will accompany the planning application.

Purpose of EIA

- 1.2.5 EIA is the process of identifying and assessing the significance of effects likely to arise from a proposed development. This requires consideration of the likely changes to the environment, where these arise as a consequence of the Proposed Development, through comparison with the existing and likely future baseline conditions in the absence of the Proposed Development.

Purpose of scoping

- 1.2.6 The process of identifying the matters to consider within an ES (establishing the scope of the assessment) is known as scoping. Scoping is not a mandatory requirement under the EIA Regulations. However, it is recognised that through the scoping exercise, the key environmental matters are identified at an early stage, which permits subsequent work to concentrate on those environmental topics for which significant effects may arise as a result of a proposed development.

Purpose of this scoping report

- 1.2.7 This document sets out details of the Proposed Development, the proposed EIA methodology and the proposed scope of technical assessments and invites comments from Welsh Ministers and its consultees regarding the scope of works. The intention of this scoping exercise is to gain agreement from all key parties regarding the proposed methodology and scope of assessment.
- 1.2.8 This Scoping Report has been informed by the following:
- Desk-top studies, site visits and surveys;
 - Review of relevant websites, such as those provided by statutory consultees;
 - Local planning policy, Planning Policy Wales and Technical Advice Notes;
 - The EIA Regulations and EIA good practice guidance; and
 - Experience of other similar developments.

The applicant

- 1.2.9 The applicant is Cenin Renewables Ltd ("Cenin"). Cenin is a Welsh renewable energy developer. Cenin is an innovative market leader in the development of large-scale energy projects and smart energy solutions as demonstrated at its Parc Stormy renewable energy cluster, which incorporates anaerobic digestion, wind and PV generation, ultra-low carbon cement production, and Cardiff University's energy positive SOLCER House.

Public consultation

- 1.2.10 An important part of the applicant's planning process is engaging with local communities

to provide information on the project and gather local feedback.

- 1.2.11 As part of the consultation process, the applicant will engage with the local community in order to inform local people about the proposals, to explain the development and its likely effects and to take on board any concerns or issues. The ES will include a summary of the pre-application public consultation carried out.

2 THE SITE AND THE PROPOSED DEVELOPMENT

2.1 The Site and its surroundings

- 2.1.1 The Application Site (the “Site”) extends to 727 hectares (ha) and is located wholly within the administrative boundary of Swansea Council. The Site is set within a rural landscape approximately 1.5km north of the village of Felindre and comprises an undulating plateau rising to 317m AOD. The Site is situated between the towns of Pontardawe and Pontardullais which lie to the west and east of the site, respectively. Upper Lliw Reservoir adjoins the Site to the north.
- 2.1.2 The Site is mostly comprised of sheep grazed rough grassland and includes scattered farmsteads at the periphery of the Site. The proposed wind turbines would sit alongside existing scattered infrastructure such as masts, pylons and the operational Mynydd y Gwair Wind Farm which lies just north of the Site. The Site is situated wholly within a Pre-assessed area for wind energy as per Policy 17 of Future Wales.
- 2.1.3 The Site includes Common Land and as such a Secondary consent will be required for exchange of common land (Section 16) and works on common land (Section 38).
- 2.1.4 Please see Figure 2.1 (Appendix A) which shows the Site’s location and red line boundary.

2.2 Project description

- 2.2.1 The Upper Lliw Energy project proposes to install up to 19 electricity generating wind turbines (or ‘wind farm’) with an installed generation capacity of circa 136MW and associated infrastructure/hardstanding. The turbines will have a base to blade tip height of 198m, 162m rotor and 119m hub.
- 2.2.2 The main components of the Proposed Development are:
- Turbines
 - Substation switches
 - Access tracks and turning heads
 - Borrow Pits
 - Temporary construction compounds and holding areas
 - Crane pads
- 2.2.3 Local ownership and distribution are important for ensuring communities in proximity to renewable energy development benefit from it and that the future energy system better serves Wales. It is estimated that annually, the electricity generated would be enough to power approximately 85,000 homes. It should be noted that the figure stated may change once more detailed assessment has been undertaken.
- 2.2.1. A Proposed Layout Plan has been prepared and will be subject to technical assessment to inform the evolution of the design to arrive at a final Proposed Layout Plan.

Design and Construction

- 2.2.4 While indicative locations of the proposed turbines have been provided, these are subject to changes in their location based on ongoing surveys and subsequent assessments.
- 2.2.5 The following are the main construction activities (but not necessarily strictly in this order of activities):
- Site preparation;
 - Delivery of construction material, plant and equipment to Site;
 - Establishment of the perimeter fence and main construction compound(s);
 - Construction of vehicular access roads;
 - Marking out the location of the development infrastructure;
 - Wind Turbines construction which will include delivery of components to site, erection of office and temporary structures, foundation excavation and construction, trenching and installation of electric cabling and construction and installation of onsite electrical infrastructure;
 - Testing and commissioning; and
 - Landscaping and other environmental enhancements, including habitat management areas.
- 2.2.6 Construction would be outsourced to a reputable, experienced and full licensed company as Equipment-Procurement-Construction (“EPC”) contract on a turn-key basis.

Electrical and Other Infrastructure

- 2.2.7 Underground electrical cabling is required to connect the wind turbines. The cables will be laid in trenches and will generally follow route of the tracks.
- 2.2.8 Within the trenches the cables will be surrounded by appropriate material and backfilled using suitable material from excavation.

Access and Transport Management

- 2.2.9 With regards to Site access, an initial assessment has indicated that access to Upper Lliw Energy could be taken via the M4, A48, Pant Lasau Road, Mynydd Gelli Wastad Road and Rhydypany Road. Assessments are ongoing to confirm this delivery route option, including for the delivery of turbine components.

Construction, Operation, Maintenance and Decommissioning

- 2.2.10 temporary laydown area and site compound for storage will be created. Temporary office and welfare facilities will be provided in a modular system. Foul water from welfare facilities will be collected from site on an as required basis.
- 2.2.11 All materials will be stored at designated contractor’s compound(s).
- 2.2.12 The main crane pad areas will remain as hardstanding areas for maintenance activities in

the future. Following further site investigations as the site progresses through the planning process, it is anticipated that winnable material for borrow pits can be sourced within the planning boundary of the site. After construction, the temporary construction areas will be reinstated.

- 2.2.13 It is expected that lighting around the site would only be required temporarily during the construction phase for safety and operational purposes, and only then when light levels require its use. If emergency lighting is needed during the operational phase, this is likely to be portable and brought to site by maintenance teams for limited use. Power will be provided by a portable generator set.
- 2.2.14 Wind turbines/wind farm development have the potential to impact civil and military aviation and telecommunications infrastructure. The impact ranges as far as primary radar stations, secondary radar stations, and weather radar stations, and thus affect operational safety. Engagement with aviation organisations such as NATS, Civil Aviation Authority (CAA), Ministry of Defence (MoD), and airport operators is being considered as part of the design process, to establish the potential impacts. This includes aspects such as aviation lighting and other mitigation measures to reduce effects on aviation.
- 2.2.15 Wind farm operation is largely autonomous with each turbine being linked to an operations control centre. Periodical maintenance visits are conducted by the turbine manufacturer or their agent. The wind farm site is monitored and maintained throughout the lifetime of the project.
- 2.2.16 At the end of the project's life span or the expiration of the planning permission whichever comes sooner, decommissioning will take place. All turbines and other above ground structures will be removed from site for recycling. Turbine foundations and other below ground structures will be reduced by 1m below the surface level and reinstated. Other infrastructure such as hardstands at turbine locations will be reinstated.

3 GENERAL APPROACH TO EIA

3.1 Information required

3.1.1 Although there is no statutory provision as to the form of an ES, it must contain the information specified in Regulation 17(3), including any relevant information specified in Schedule 4 of the EIA Regulations, as set out below:

1. A description of the development including in particular:
 - a. A description of the location of the development;
 - b. A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;
 - c. A description of the main characteristics and the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the minerals and natural resources (including water, land, soil and biodiversity) used;
 - d. An estimate, by type and quantity, of expected residues and emissions (such as water, air, soils and sub soil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases.
2. A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen opinion, including a comparison of the environmental effects;
3. A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.
4. A description of the factors specified in regulation 4(2) likely to be significantly affected by the development; population, human health, biodiversity (for example fauna and flora), land, (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaption), material assets, cultural heritage, including archaeological aspects, and landscape.
5. A description of the likely significant effects of the development on the environment resulting from, inter alia:
 - a. The construction and existence of the development, including, where relevant, demolition works;
 - b. The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
 - c. The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;

- d. The risks to human health, cultural heritage or the environment (for example due to accidents or disasters);
- e. The cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
- f. The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;
- g. The technologies and the substances used.

3.1.2 The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.

1. A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.
2. A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases.
3. A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.
4. A non-technical summary of the information provided.
5. A reference list detailing the sources used for the descriptions and assessments included in the environmental statement.

3.1.3 The information supplied in the ES will provide a clear understanding of the likely significant effects of the project upon the environment. The following sections outline the overall approach to EIA in order to meet these legal requirements.

3.2 Structure of the Environmental Statement (ES)

3.2.1 The ES will be structured logically, enabling all relevant environmental information to be found quickly and easily. The ES will describe the EIA process and its findings, and will include the following sections:

- Non-Technical Summary (as a standalone document)
- Written Statement (ES Volume 1)
- Figures (ES Volume 2)

- Appendices (ES Volume 3)

3.3 EIA Methodology

Relevant EIA guidance

3.3.1 The EIA process will take into account relevant government or institute guidance, including:

- Welsh Office Circular 11/99: Environmental Impact Assessment
- Highways Agency et al. (2008) Design Manual for Roads and Bridges, Volume 11, Section 2, Part 5. HA 205/08
- Institute of Environmental Management and Assessment (2004) Guidelines for Environmental Impact Assessment
- Institute of Environmental Management and Assessment (2011) The State of Environmental Impact Assessment Practice in the UK. Special Report
- Institute of Environmental Management and Assessment (2015a) Environmental Impact Assessment: Guide to Shaping Quality Development
- Institute of Environmental Management and Assessment (2015b) Climate Change Resilience and Adaptation
- Institute of Environmental Management and Assessment (2016) Environmental Impact Assessment: Guide to Delivering Quality Development
- Institute of Environmental Management and Assessment (2017) Environmental Impact Assessment: Assessing Greenhouse Gas Emissions and Evaluating their Significance
- Institute of Environmental Management and Assessment (2017) Health in Environmental Impact Assessment: A Primer for a Proportional Approach.

3.3.2 Other topic-specific specialist methodologies and good practice guidelines will be drawn upon as necessary and have been stated in topic sections.

Key elements of the general approach

3.3.3 The assessment of each environmental topic will form a separate chapter of the ES. For each environmental topic, the following will be addressed:

- Methodology and assessment criteria
- Description of the environmental baseline (existing conditions)
- Identification of likely effects
- Evaluation and assessment of the significance of identified effects, taking into account any measures designed to reduce or avoid environmental effects which form part of the project and to which the developer is committed
- Identification of any further mitigation measures envisaged to avoid, reduce and, if possible, remedy adverse effects (in addition to those measures that form part of the project)

Methodology and assessment criteria

- 3.3.4 Each topic chapter will provide details of the methodology for baseline data collection and the approach to the assessment of effects. Details of the proposed approach for each topic chapter are provided in Sections 5 – 14 of this Scoping Report. Each identified environmental topic will be considered by a specialist in that area. The identification and evaluation of effects will consider relevant topic-specific guidance where available.

Description of the environmental baseline

- 3.3.5 The existing and likely future environmental conditions in the absence of the project are known as 'baseline conditions'. Each topic-based chapter will include a description of the current (baseline) environmental conditions. The baseline conditions at the Site and within the study area form the basis of the assessment, enabling the likely significant effects to be identified through a comparison with the baseline conditions.
- 3.3.6 The baseline for the assessment of environmental effects will primarily be drawn from existing conditions during the main period of the EIA work. Consideration will also be given to any likely changes between the time of survey and the future baseline for the construction and operation of the project. In some cases, these changes may include the construction or operation of other planned developments in the area. Where such developments are built and operational at the time of writing and data collection, these will be considered to form part of the baseline environment. Where sufficient and robust information is available, such as expected traffic growth figures, other future developments will be considered as part of the future baseline conditions. In all other cases, planned future developments will be considered within the assessment of cumulative effects.
- 3.3.7 The consideration of future baseline conditions will also take into account the likely effects of climate change, as far as these are known at the time of writing. This will be based on information available from the UK Climate Projections project (UKCP18), which provides information on plausible changes in climate for the UK (Environment Agency and Met Office, 2018) and on published documents such as the UK Climate Change Risk Assessment 2017 (Committee on Climate Change, 2016).

Assessment of effects

- 3.3.8 The EIA Regulations require the identification of the likely significant environmental effects of the project. Each topic chapter will take into account both the sensitivity of receptors affected and the magnitude of the likely impact in determining the significance of the effect.

Sensitivity and importance of receptors

- 3.3.9 Receptors are defined as the physical resource or user group that would be affected by a Proposed Development. The baseline studies will identify potential environmental receptors for each topic and will evaluate their sensitivity to the Proposed Development. The sensitivity or importance of a receptor may depend, for example, on its frequency or extent of occurrence at an international, national, regional or local level.

Magnitude of impact

- 3.3.10 Impacts are defined as the physical changes to the environment attributable to the project.

For each topic, the likely environmental impacts will be identified. The magnitude of the impact will be described using defined criteria within each topic chapter.

3.3.11 The categorisation of the impact magnitude may take into account the following four factors:

- Extent
- Duration
- Frequency
- Reversibility

3.3.12 Impacts will be defined as either adverse or beneficial. Depending on discipline, they may also be described as:

- Direct: arising from activities associated with the project. These tend to be either spatially or temporally concurrent.
- Indirect: impacts on the environment which are not a direct result of the project, often produced away from the project site or as a result of a complex pathway.

3.3.13 Impacts will be divided into those occurring during the construction phase and those occurring during operation. Where appropriate, some chapters may refer to these as temporary and permanent impacts.

Significance of effects

3.3.14 Effect is the term used to express the consequence of an impact (expressed as the 'significance of effect'), which is determined by correlating the magnitude of the impact to the sensitivity of the receptor or resource.

3.3.15 The magnitude of an impact does not directly translate into significance of effect. For example, a significant effect may arise as a result of a relatively modest impact on a resource of national value, or a large impact on a resource of local value. In broad terms, therefore, the significance of the effect can depend on both the impact magnitude and the sensitivity or importance of the receptor.

3.3.16 Levels of significance that will be used in the assessment include, in descending order:

- Substantial
- Major
- Moderate
- Minor
- Neutral

3.3.17 Where an effect is described as 'neutral' this means that there is either no effect or that the significance of any effect is considered to be negligible. All other levels of significance will apply to both adverse and beneficial effects. These significance levels will be defined separately for each topic within the methodology sections.

3.3.18 In all cases, the judgement made as to significance will be that of the author of the relevant

chapter with reference to appropriate standards/guidelines where relevant.

Cumulative effects

- 3.3.19 The cumulative effects of the Proposed Development in conjunction with other proposed schemes will be considered. The cumulative effects assessment will consider any developments that are in the pre-application stage, formally in the planning system or approved by unimplemented at the time of submission. Developments that are built and operational at the time of assessment will be considered as part of the baseline.
- 3.3.20 The applicant intends to submit a pre-application advice request in parallel with this EIA Scoping Direction request. Accordingly, the cumulative schemes to be considered in the ES will be agreed with Swansea Council prior to this list being finalised.

Transboundary and Inter-related Effects

- 3.3.21 Transboundary effects arise when impacts from a project within one European Economic Area (EEA) state affect the environment of another state(s). The need to consider such transboundary effects has been embodied by the United Nations Economic Commission for Europe (DECC) Convention on EIA in a Transboundary Context (commonly referred to as the 'Espoo Convention').
- 3.3.22 The 2017 EIA Regulations require consideration of the indirect and secondary likely significant impacts of the Proposed Development, i.e. inter-related effects. For example, the separate impacts of noise and habitat loss may have an effect upon a single receptor.
- 3.3.23 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur as a result of the Proposed Development.

Mitigation measures

- 3.3.24 The EIA Regulations require that where significant effects are identified 'a description of any features of the Proposed Development, or measures envisaged in order to avoid, prevent or reduce or, if possible, offset likely significant adverse effects on the environment' should be included in the ES.
- 3.3.25 The development of mitigation measures is part of an iterative EIA process. Therefore, measures will be developed throughout the EIA process in response to the findings of initial assessments. The project that forms the subject of the planning application will include a range of measures designed to reduce or prevent significant adverse environmental effects arising, where practicable. In some cases, these measures may result in enhancement of environmental conditions. The assessment of effects will therefore take into account all measures that form part of the project and to which Lightsource bp are committed.
- 3.3.26 The topic chapters will therefore take into account all measures that form part of the Proposed Development, including:
 - Measures included as part of the project design (sometimes referred to as primary mitigation).
 - Measures to be adopted during construction to avoid and minimise environmental effects, such as pollution control measures. These measures would be implemented

through the Construction Environmental Management Plan (CEMP).

- Measures required as a result of legislative requirements.

- 3.3.27 Where required, further mitigation measures will be identified within topic chapters. These are measures that could further prevent, reduce and, where possible, offset any residual adverse effects on the environment.
- 3.3.28 In some cases, monitoring measures may be appropriate, for example, to ensure that proposed planting becomes established. Where appropriate, monitoring measures will be set out.

Summary tables

- 3.3.29 Tables will be used to summarise the effects of the project for each environmental topic.

4 SCOPE OF ASSESSMENT

4.1 Work undertaken to date

- 4.1.1 The following studies have been undertaken or are currently ongoing in relation to the Proposed Development.

Landscape

- An initial digital Zone of Theoretical Visibility (ZTV) model has been produced. This was based on a 'bare-earth' scenario, whereby the screening effect of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed blade tip height of 198m, and turbine hub height of 119m.
- Initial studies have been undertaken to identify the potential landscape and visual receptors to be considered within the LVIA and the viewpoint locations to inform the assessment.

Ornithology

- A desk study was completed in May 2022. This included a review of aerial imagery and maps to broadly assess habitat types and connectivity, and a review of species and non-statutory site data from Aderyn, the Local Environmental Records Centre (LERC) Wales, Biodiversity and Reporting Database.
- Bird survey work started at the Site in September 2022. The following field surveys were completed in 2022, 2023 and 2024.
 - Vantage Point (VP) surveys
 - Breeding raptor surveys
 - Waterbird counts of the Upper Lliw Reservoir

Biodiversity

- A desk study was completed in April 2023. This included a review of aerial imagery, Ordnance Survey maps and the UK Government's 'Magic' website to broadly assess habitat types and connectivity, and a review of species and non-statutory site data from the South East Wales Biodiversity Records Centre (SEWBReC). The search area extended to 2 km around the Site (10 km for bats). This helped inform the approach to survey work.

Aviation and Telecommunications

- Consultation with relevant link operators has been undertaken (see paragraph 4.2.25 – 4.2.29)
- An initial Aviation Risk Assessment has been undertaken

Ground Conditions

- A CMRA has been undertaken on a preliminary layout and will be updated based on the final site layout.

Heritage

- Cultural Heritage Desk-Based Assessment (DBA)

4.2 Topics scoped out of assessment

4.2.1 Taking into account the findings of the above studies, together with our knowledge of the Site and surrounding area, it is proposed that the following topics are not included in the scope of the ES:

- Planning policy context (stand-alone chapter);
- Population;
- Land and soil;
- Air Quality;
- Human Health;
- Climate Change;
- Material Assets;
- Aviation and Telecommunications;
- Risk of Major Accidents; and
- Waste

Planning policy context

4.2.2 The ES will provide an overview of relevant legislative and planning policy context within each topic chapter. The assessment will have regard to national and local policy documents, where relevant. However, it is not proposed to include a separate chapter on Planning Policy Context in the ES. The draft guidance on EIA from the Department for Communities and Local Government 'EIA: A Guide to Good Practice and Procedures' (DCLG 2006) (paragraph 155) states that there is no requirement to provide chapters on planning and sustainability in Environmental Statements.

4.2.3 A separate Planning Statement will be submitted with the planning application and the environmental topic chapters within the ES will each set out the policy context relevant to that topic.

Population and Human Health

- 4.2.4 The construction phase will have a temporary effect on employment provision through the creation of construction jobs. This is unlikely, however, to result in a significant change in population as workers are unlikely to relocate to an area on a permanent basis. Therefore, a minor beneficial effect is therefore anticipated for a temporary period. This would not be significant in EIA terms.
- 4.2.5 The direct human health effects of the Proposed Development are limited, the Proposed Development will displace primary fossil fuel derived electricity, and the consequent Greenhouse Gases and other pollutants released during fossil fuel combustion and would result in a beneficial effect on human health. This would not be significant in EIA terms.
- 4.2.6 Population and human health are therefore proposed to be scoped out of the ES.

Land and Soil

- 4.2.7 A review of the Welsh Government's Data Map Wales online predictive mapping resource identifies that the Site is a mixture of Grades 4 and 5 so does not include any high-grade land that would be considered to be best and most versatile (BMV). No further assessment of the potential impact of the proposal on the best and most versatile agricultural land is therefore required.
- 4.2.8 The construction, operation and decommissioning of the Proposed Development would seek to minimise ground works as far as practicable. Where ground works are necessary, these works would be subject to appropriate techniques to minimise any compaction of soils and therefore mitigating any potential impact on the soils structure and ability to infiltrate water. Through appropriate management, the future quality of the agricultural land will be maintained and no likely significant lasting adverse effects on the quality of the soil are anticipated.
- 4.2.9 The Proposed Development will result in a change of land use from Common Land which is accessible for recreation and livestock grazing purposes. Consequently, the Proposed Development will also include compensation measures to mitigate against the loss of Common Land in the form of provision of exchange land which will be subject to a secondary consent to the DNS. Whilst the Common Land use is to be displaced through the exchange process, the Proposed Development will be designed to allow for continued recreation and livestock grazing uses around the turbines. The co-location of the Proposed Development with the existing land use, together with the provision for exchange land mean that the impact of the Proposed Development on land use will not be significant.
- 4.2.10 Land and Soil is therefore proposed to be scoped out of the ES.

Air Quality

- 4.2.11 The Proposed Development is not within, or near to any declared Air Quality Management Areas (AQMAs).
- 4.2.12 The main activities and production of any emissions will be limited to construction works and use of mobile construction plant and construction vehicles. Construction works will be localised, short term, sporadic and controlled through the implementation of good construction practice. Fixed and mobile plant will be limited in size and number and operate

for short periods.

- 4.2.13 Dust impacts are unlikely to occur due to the distances of receptors from areas where works are proposed to be undertaken. Best practice measures would be put in place during construction to minimise dust impacts. Therefore, no significant dust effects are anticipated.
- 4.2.14 The construction phase will be controlled through management plans that will be secured by the planning permission including a Construction Traffic Management Plan (CTMP) which will demonstrate that construction materials can be transported by environmentally friendly means; identify construction deliveries that could be reduced, re-timed or consolidated, particularly during peak periods; and encourage use of modern, low emission vehicles. A Construction Environmental Management Plan (CEMP) will detail good practice dust control measures as recommended by the IAQM.
- 4.2.15 During the operational phase of the Proposed Development, only a small number of vehicle movements (approximately 1-2 visits per month) will be required to maintain the turbines and associated infrastructure. The operational traffic generated by the Proposed Development would have a negligible influence on the surrounding population and highway network. Therefore, the effects from operational traffic-related air pollutants are anticipated to be not significant.
- 4.2.16 Air quality is therefore proposed to be scoped out of the ES on the basis that all potential impacts and effects will be temporary in nature and will be fully controlled by construction management plans.

Climate Change

- 4.2.17 The EIA Regulations require consideration of climate change. Although a separate climate change chapter is not proposed, the ES will identify how the Proposed Development is likely to affect the ability of the natural environment (including habitats, species and soils) to adapt to climate change as well as its ability to contribute towards climate change adaptation. This will include impacts on the vulnerability or resilience of receptor as well as impacts on how the environment can accommodate change. This will be considered in each topic chapter of the ES and in supporting assessments for topics scoped out of the EIA.
- 4.2.18 The Proposed Development will contribute to climate change mitigation through the production of renewable energy.
- 4.2.19 The Design process and EIA will consider potential consequences of climate change such as flood risk and extreme weather conditions. Appropriate design mitigation measures will be implemented, as necessary.
- 4.2.20 Climate change is therefore proposed to be scoped out of the ES.

Material assets

- 4.2.21 The EIA Regulations refer to 'material assets', including architectural and archaeological heritage. The phrase 'material assets' has a broad scope, which may include assets of human or natural origin, valued for socio-economic or heritage reasons.
- 4.2.22 Material assets are in practice considered across a range of topic areas within an ES, in particular the historic environment chapter. This topic is proposed to be included within the ES (see Table 4.1). Therefore, no separate consideration of material assets is considered necessary.
- 4.2.23 Material assets is therefore proposed to be scoped out of the ES.

Aviation and Telecommunications

- 4.2.24 Wind turbines have the potential to impact aviation activity and telecommunication infrastructure in its vicinity. This is predominantly due to:
- Wind turbines posing an obstruction as a physical structure and therefore presenting a collision risk for aircraft;
 - Wind turbines reflecting a radar signal and causing false returns/radar clutter for aviation radar;
 - Diffraction of the electromagnetic wave by partially blocking the radio signal passing it, thereby reducing the functionality of the telecommunications link;
 - Reflection of the electromagnetic wave by reflecting the signal between the transmitter and receiver of a telecommunications link.

Aviation

- 4.2.25 An initial Aviation Risk Assessment highlighted the following identified key aviation risks:
- Royal Air Force (RAF) Manorbier Primary Surveillance Radar (PSR).
 - MOD Aberporth Range PSR
 - MOD low flying areas.
- 4.2.26 Technical analysis will be undertaken to determine the level of impact and, where required, the appropriate mitigation options. Mitigation options can be progressed through consultation with the relevant stakeholders. A significant effect occurs where both technical and operational effects upon radar or aviation operations lead to reduced safety as a direct result of the Proposed Development.
- 4.2.27 The MOD's main concerns relate to the technical and operational impacts upon their PSR. Although within line-of-sight to the PSR, operational impacts upon the PSR are not predicted due to turbines not being located in operationally sensitive areas. Consultation with the MOD will confirm the impact and mitigation requirement. Subject to this mitigation being implemented, no significant cumulative or environmental impacts are predicted.

- 4.2.28 The Proposed Development is located in an area of low priority for low-flying and therefore not predicted to impact low-flying operations. The Proposed Development will require an aviation lighting scheme in accordance with CAA policy, and consultation with the MOD will confirm the lighting requirement in the interest of low-flying. Subject to this mitigation being implemented, no significant cumulative or environmental impacts are predicted.
- 4.2.29 This topic will be addressed through the preparation of an Aviation Risk Assessment which will form an appendix to the ES.

Telecommunications

- 4.2.30 The most prevalent stakeholders and link operators include: Airwave (Motorola Solutions), Arqiva, Atkins, British Telecom (BT), the Joint Radio Company (JRC), Mobile Broadband Network Limited (MBNL), MLL Telecom, Virgin Media O2, and Vodafone. Each of these link operators, excluding Airwave, have been consulted. If a link operator raises an objection, an assessment of their infrastructure will be undertaken to determine whether a significant effect may occur. The infrastructure data supplied by the stakeholder will be used to model exclusion zones of each link and to calculate the clearance/infringement of the Proposed Development. A significant effect occurs where the outcome of the analysis confirms the infringement of a link, and that mitigation will be necessary. The process for mitigation is to engage with the stakeholder managing the link to discuss a mitigation strategy, with options including micrositing turbines, re-networking of the link via existing telecommunications sites, relocating the telecommunications site, and using a leased line.
- 4.2.31 BT Group, MBNL, MLL Telecom, Virgin Media O2 and Vodafone have confirmed that their link infrastructure does not operate within close vicinity of the Proposed Development and therefore have no objections.
- 4.2.32 Atkins and the JRC are yet to confirm their position on the Proposed Development.
- 4.2.33 Arqiva has provided the details of their link infrastructure within close vicinity to the Proposed Development. The Proposed Development is expected to be clear of the link infrastructure. Therefore, no significant cumulative or environmental impacts are predicted.
- 4.2.34 It is expected that the proposals will not give rise to significant EIA effects regarding aviation and telecommunications. Based on the commitment to ensure there is no significant impact as a result of the Proposed Development, it is proposed that aviation and telecommunication is scoped out of the ES.
- 4.2.35 This topic will be addressed through the preparation of a Telecommunications Impact Assessment which will form an appendix to the ES.

Risk of major accidents

- 4.2.36 Wind energy electricity generation has very low risk of accident or disaster and will not have a significant environmental effect in this regard.
- 4.2.37 The Site is located in a rural area with few nearby receptors. Risk assessments will ensure that all potential risks are identified at an early stage and appropriate mitigation is implemented. During the operational stage, routine maintenance inspections will be completed in order to ensure compliant operation of the scheme.

- 4.2.38 With this in mind, a separate chapter assessing the risk of major accidents and disasters is not considered necessary and the risk of major accidents and disasters would be considered elsewhere in the ES. General risk and major accidents would be considered in the project description chapter, whereas traffic and transport and flood risk would be included in their respective chapters.
- 4.2.39 It is therefore considered unlikely that there would be any risk of major accidents associated with the Proposed Development and therefore the topic can be scoped out of the ES.

Waste

- 4.2.40 EIA Regulations requires consideration of the production of waste. Details of the waste produce as a result of the Proposed Development will be included within the Project Description chapter of the ES. Any waste is likely to be generated during the construction phase of the development will be identified and set out within a waste management plan prior to construction. A Site Waste Management Plan (SWMP) will be developed to minimise waste generation and maximise reuse and recycling during the construction phase, this will form part of a wider Construction Environmental Management Plan (CEMP).
- 4.2.41 No further assessment of waste management is proposed as part of the EIA and as such Waste is proposed to be scoped out of the ES.

4.3 Content of the Environmental Statement

- 4.3.1 The scope of the EIA takes into account the preliminary environmental information pertinent to the Proposed Development Site and as a result, the issues set out below are considered appropriate for assessment in an ES. It is considered that the Proposed Development may have the potential to give rise to significant environmental effects in these areas:

- Landscape and Visual
- Traffic and Transport
- Hydrology and Flood Risk
- Geology and Hydrogeology
- Biodiversity
- Ornithology
- Noise
- Shadow Flicker
- Socioeconomics
- Historic Environment

- 4.3.2 **Table 4.1** below confirms the proposed structure of the ES.

Table 4.1: Structure of the ES

Structure of ES	
Non-Technical Summary	Summary of the ES using non-technical terminology
Volume 1: Text	

Structure of ES	
	Glossary
Chapter 1	Introduction
Chapter 2	Project Description
Chapter 3	Need and Alternatives Considered
Chapter 4	Environmental Assessment Methodology
Chapter 5	Landscape and Visual Impact Assessment
Chapter 6	Traffic and Transport
Chapter 7	Hydrology and Flood Risk
Chapter 8	Geology and Hydrogeology
Chapter 9	Biodiversity
Chapter 10	Ornithology
Chapter 11	Noise
Chapter 12	Shadow Flicker
Chapter 13	Socioeconomics
Chapter 14	Historic Environment
Volume 2: Figures	
Including all figures and drawings to accompany the text.	
Volume 3: Appendices	
Including specialist reports forming technical appendices to the main text.	

- 4.3.3 The following sections provide details for each of the chapters that are proposed to be included in the ES.

5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.1 Introduction

- 5.1.1 It is acknowledged from the outset that, in common with almost all commercial wind energy developments that some significant landscape and visual effects would occur as a result of the Proposed Development.
- 5.1.2 A key principle of the European Landscape Convention is that all landscapes matter and should be managed appropriately. It is also acknowledged that landscapes provide the surroundings for people's daily lives and often contribute positively to the quality of life and economic performance of an area.
- 5.1.3 Therefore, it is proposed that a Landscape and Visual Impact Assessment (LVIA) is undertaken as part of the EIA and an LVIA Chapter be included in the Environmental Statement (ES). The LVIA will be undertaken by a team of Landscape Architects, including a Chartered Member of the Landscape Institute, who are experienced in the assessment of large scale, onshore wind energy projects and are fully familiar with the landscape in the vicinity of the site.
- 5.1.4 It is proposed that the LVIA will consider the potential effects of the Proposed Development upon:
- Individual landscape features and elements;
 - Landscape character; and
 - Visual amenity and the people who view the landscape.

The Site

- 5.1.5 The Site is primarily comprised of an undulating plateau rising up to 317m AOD, which is drained by the Afon Llan to the east and the Afon Lilw to the west, with the latter watercourse connecting the Upper Lilw and Lower Lilw reservoirs beyond the site boundary. The Site is mostly comprised of sheep grazed rough grassland and includes scattered farmsteads at the periphery of the site.
- 5.1.6 The nearest settlements to the proposed turbines are: Rhyd-y-gwin ca.1.1 km to the southeast; Craig cefn-parc ca.1.6km to the southeast; Fagwyr-isaf ca.1.9km to the southeast, Felindre ca.2.1 km to the southwest; Clydach ca.2.9km to the southeast, Pontardawe ca. 3.7km to the southeast, Pontarddulais ca.4.3km to the southwest and Ammanford, 4.9km to the northwest.
- 5.1.7 The nearest main transport routes include: the A474 ca.3.2 km to the northeast of the Site; the A58 ca.4.6 km to the southwest. The Gower Way long distance footpath passes through the centre of the Site within the Afon Lliw valley and the majority of the Site is open access land.
- 5.1.8 The Site and the proposed indicative turbine locations are shown on Figure 5.1 (Appendix B).

Guidance and Legislation

- 5.1.9 The LVIA will be prepared in accordance with the principles of best practice, as outlined in published guidance documents, notably the third edition of the Guidelines for Landscape and Visual Assessment (GLVIA3).

“This edition concentrates on principles and processes. It does not provide a detailed or formulaic ‘recipe’ that can be followed in every situation – it remains the responsibility of the professional to ensure that the approach and methodology adopted are appropriate to the task in hand.”

- 5.1.10 The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose. Consideration has also been given to the following documents:

- Future Wales: The National Plan 2040 (2021);
- Siting and Designing Windfarms in the Landscape (Scottish Natural Heritage (SNH), 2017);
- Visual Representation of Wind Farms Guidance, Version 2.2, Scottish Natural Heritage (2017);
- Landscape Institute (2019) Technical Guidance Note 02/19, Residential Visual Amenity Assessment.

- 5.1.11 Full details of the methodology will be provided within the LVIA chapter of the ES.

5.2 Proposed Scope of Assessment

- 5.2.1 It is proposed that the main objectives of the LVIA will be as follows:

- To identify, evaluate and describe the current landscape character of the Site, its surroundings and any notable individual or groups of landscape features within the Site;
- To determine the sensitivity of the landscape to the type of development proposed;
- To identify potential visual receptors (i.e. people that would be able to see the Proposed Development) and evaluate their sensitivity to the type of changes proposed;
- To identify and describe any impacts of the Proposed Development in so far as they affect the landscape and/or views of it and evaluate the magnitude of change due to these impacts;
- To identify and describe any mitigation measures (including mitigation which is inherent in the design and layout of the development) that have been adopted to avoid, reduce and compensate for landscape and visual effects;
- To identify and assess any cumulative landscape and visual effects;
- To evaluate the level of residual landscape and visual effects; and
- To make a professional judgement about which effects, if any, are significant.

Distinction between Landscape and Visual Effects

- 5.2.2 In accordance with the published guidance, landscape and visual effects will be assessed separately, although the procedure for assessing each of these is closely linked. A clear distinction has been drawn between landscape and visual effects as described below:
- Landscape effects relate to the effects of the Proposed Development on physical and perceptual characteristics of the landscape and its resulting character and quality; and
 - Visual effects relate to the effects on specific views experienced by visual receptors and on visual amenity more generally.

Study Area

- 5.2.3 The Site and all of the proposed turbines lie within a 'Pre-assessed Area for Wind Energy' identified within Policy 17 of Future Wales, where there is a presumption in favour of development, subject to the criteria of Policy 18.
- 5.2.4 In order to assist with defining the study area, a digital Zone of Theoretical Visibility (ZTV) model has been produced as a starting point to illustrate the geographical area within which views of the proposed development on the site are theoretically possible. This was based on a 'bare-earth' scenario, whereby the screening effect of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to blade tip height using the currently proposed blade tip height of 198 m, and turbine hub height of 119 m, and is presented at Figure 5.3 (Appendix B).
- 5.2.5 With reference to 'Using LANDMAP in Landscape and Visual Impact Assessment GN46'¹, based on the preliminary blade tip height, a study area of 27 km is proposed.
- 5.2.6 The cumulative effect of the Proposed Development in association with other wind energy developments will also be considered. It is proposed that a 30 km radius search area will be adopted to consider cumulative effects, which is considered to represent a proportionate extent of the study area and the limit within which any potential significant cumulative effects could occur.

Baseline Conditions

- 5.2.7 Initial studies have been undertaken to identify the potential landscape and visual receptors to be considered within the LVIA and the viewpoint locations to inform the assessment (15 proposed viewpoints are set out in Table 5.1). This is based on the initial ZTV (Figure 5.3 (Appendix B)) and knowledge of the area surrounding the Site.
- 5.2.8 Four viewpoints have been selected within the Brecon Beacons National Park. No viewpoints were selected within the Gower National Landscape (AONB), more than 13.5km from the closest proposed turbine, with the city of Swansea in between. Limited theoretical visibility is indicated from the Gower National Landscape by the bare earth ZTV, and

¹ Natural Resources Wales. 2023. 'Using LANDMAP in Landscape and Visual Impact Assessments GN46'. Last updated: 11 March 2024

preliminary analysis of vegetation cover indicated no obvious locations where views of the Proposed Development would be clearly available.

- 5.2.9 The key receptors are outlined in turn below. For the final LVIA, detailed baseline information on the landscape and visual resource will be gathered through a combination of desk studies, consultation and field survey.

Landscape Character

- 5.2.10 Regarding Landscape Character, the most up to date and relevant landscape character assessment covering the study area is the 2014 National Landscape Character Areas (NLCA) published by Natural Resources Wales.

- 5.2.11 The Site falls within the western extents of NLCA 37: South Wales Valleys (Figure 5.2 (Appendix B)), as identified by the published document. Its key characteristics are described as:

- 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.

- Iconic cultural identity – many popular images of a tough, rugby-playing, religious, radically-minded society still remain associated with the South Wales Valleys, however today's post-industrial, internet-connected reality is somewhat different.

5.2.12 Other NLCAs within 15 km of the Site are listed by distance from the site:

- 38. Bae Abertawe / Swansea Bay (ca.1.6km in the south)
- 33 Cymoedd Gwendraeth / Gwendraeth Vales (ca.4.9km northwest)
- 30 Bannau Brycheiniog a'r Mynyddoedd Du / Bannau Brycheiniog (Brecon Beacons) and Black Mountains (ca.8km northeast)
- 39 Penrhyn Gŵyr / Gower (ca. 10.2km southwest)
- 41 Dyffryn Tywi / Tywi Valley (ca. 13.3km north)

5.2.13 National Character Areas will be assessed in detail where the potential for significant indirect effects occurs which is likely to be a function of ZTV coverage, distance from the Proposed Development and field assessment.

5.2.14 The LVIA will also include an assessment of the sensitivity of landscape character, based on the Landmap Aspect Areas in accordance with the NRW Landmap GN462 in order to identify potentially significant effects.

Landscape Designations

5.2.15 Landscape designations are illustrated on Figure 5.2 (Appendix B). The Site is not located within a nationally designated landscape.

5.2.16 Brecon Beacons National Park is located ca. 8.2 km to the north of the Site.

5.2.17 Special Landscape Areas (SLA) are a non-statutory designation applied by local planning authorities in Wales to define areas of high landscape importance within their administrative boundary. The Site is located within the Special Landscape Area 'Mawr Uplands'.

5.2.18 The Gower National Landscape (AONB) is part of a family of 46 National Landscapes and 13 National Parks in England, Wales and Northern Ireland. The designation is located more than 13.5km southwest of the closest proposed turbine.

Visual Receptors

5.2.19 A detailed consideration of the potential for effects to the visual amenity of receptors in the landscape surrounding the Site will be set out in the LVIA. This visual assessment will be informed by a selection of representative assessment viewpoints which are listed in Table 5.1.

5.2.20 The LVIA will focus on the potential effects of the Proposed Development on different visual receptors comprising settlements, footpath users, recognised tourist routes, long distance walking routes, cycle routes, centres for tourism and rail routes.

² Natural Resources Wales. 2023. 'Using LANDMAP in Landscape and Visual Impact Assessments GN46'. Last updated: March 2023

Residential Visual Amenity

- 5.2.21 A number of residential properties are located within the vicinity of the Proposed Development. It is proposed that a Residential Visual Amenity Assessment (RVAA) will be undertaken as part of the LVIA. This will consider the visual effects on those properties within 1.5 km to 2 km of the Proposed Development and identify any properties where residents could experience adverse visual effects to the degree that the Residential Visual Amenity Threshold (RVAT) would be breached. The findings will be presented in a separate Technical Appendix to the LVIA chapter.

Proposed Viewpoints

- 5.2.22 It is proposed that the 15 locations set out in Table 5.1 and shown on Figure 5.3 and Figure 5.4 (Appendix B) are included as assessment viewpoints in the LVIA. The viewpoints represent visual receptors and landscape designations at a range of distances and directions from the site.

Table 5.1: Proposed LVIA Viewpoints

Viewpoint	Distance and Direction from nearest turbine	OS Grid Reference		Reason for selection
Viewpoint 1- Lower Lliw Reservoir	1.4 km southwest	264859	203424	Gower Way long distance footpath near parking and visitor centre.
Viewpoint 2- Rhyd-y-gwin	1.9 km southeast	267461	202901	View from public bridleway on higher ground at the western edge of the settlement.
Viewpoint 3-Mynydd Gellionnen	2.3km east	269725	204399	View from Cwm Clydach Walk long distance footpath on lower slopes of Mynydd Gellionnen open access land.
Viewpoint 4- Pen y Cwar	2.4 km northwest	263311	207970	View from summit of Pen y Cwar on St Illtyd's Walk long distance footpath route.
Viewpoint 5- Mynydd Carnllechart	2.7 km northeast	269124	207735	View from crossroads on the northern slopes of Mynydd Carnllechart on St Illtyd's Walk long distance footpath route.
Viewpoint 6- Graig Fawr	3.2km west	261167	206383	View from Heart of Wales Line Trail and on St Illtyd's Walk long distance footpath route.
Viewpoint 7- Pontlliw	5.0 km southwest	261254	201287	View from Gower Way long distance footpath route on the eastern edge of the settlement.
Viewpoint 8- Mynydd Drumau	7.4 km southeast	272515	199575	Public Bridleway north of Careg Bica standing stone
Viewpoint 9- Mynydd Cadle	7.8 km south	264577	196816	Highest point on open access land adjacent to settlement edge

Viewpoint	Distance and Direction from nearest turbine	OS Grid Reference		Reason for selection
Common, Swansea				
Viewpoint 10- Mynydd Allt-y-grug	7.9 km northeast	275081	207937	Summit of Mynydd Allt-y-grug within open access land
Viewpoint 11- Llandybie	10 km northwest	262436	215893	Heart of Wales Line Trail on northeast edge of settlement
Viewpoint 12- Upper Brynamman	10.4 km northeast	271328	215398	Bridleway north of the settlement on lower slopes of Foel Deg ar Bedol. Within the Brecon Beacons National Park.
Viewpoint 13- North of Cwmgiedd	13.4 km northeast	277819	214196	Bridleway on open access land. Within the Brecon Beacons National Park.
Viewpoint 14- Sarn Helen	20.2 km northeast	286903	211180	Byway on course of Roman Road. Within the Brecon Beacons National Park.
Viewpoint 15- Fan Brycheiniog summit	22.1 km northeast	282524	221798	Summit located on the Cambrian Way and Beacons Way long distance footpaths. Within the Brecon Beacons National Park.

- 5.2.23 Each of the representative viewpoints will be visited to evaluate the sensitivity of views. In addition, the study area will also be visited to consider visibility of the Proposed Development as receptors move through the landscape.
- 5.2.24 The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. The sensitivity of different receptor groups will be set out in the LVIA methodology.
- 5.2.25 The level of effect experienced by different visual receptors will be determined by considering the sensitivity of the receptors with the magnitude of change resulting from the introduction of the Proposed Development.

Visualisations

- 5.2.26 Each viewpoint will be illustrated with visualisations prepared in line with SNH Visual Representation of Wind Farms Version 2.2.

Night-time Lighting Assessment

- 5.2.27 Under Civil Aviation Authority (CAA) Regulations³ structures over 150m in height are required to be lit with visible aviation lighting.
- 5.2.28 In accordance with NatureScot guidance⁴ the LVIA will assess the additional visual effects of the aviation lighting in the main body of the LVIA chapter. The additional change introduced by the aviation lighting will form a component of the magnitude of change.
- 5.2.29 The assessment of the visible aviation lighting will be informed by a ZTV of the lit turbines, a turbine lighting intensity ZTV and night-time visualisations from a selection of viewpoints, illustrating the proposed lighting effects.
- 5.2.30 In line with NatureScot Visualisation Guidance, the viewpoints selected represent locations from where people are most likely to experience the wind farm at night. The Brecon Beacons National Park is an International Dark Sky Reserve and is located approximately 8.2km to the north of the closest turbine.
- 5.2.31 It is proposed that the following night-time visualisations will be produced:
- Viewpoint 1 – Lower Lliw Reservoir (on the Gower Way long distance footpath near carpark and visitor centre);
 - Viewpoint 2- Craig Cefn Parc (edge of settlement); and
 - Viewpoint 12 - Bridleway north of Upper Brynamman (within the Brecon Beacons National Park).
- 5.2.32 The viewpoints will be used to inform consideration of the potential visual effects on key visual receptors in nearby residential properties, settlements and users of the road network.

Cumulative Assessment

- 5.2.33 The LVIA will also consider the potential for any cumulative effects to arise as a result of turbines located within 30 km of the Proposed Development. This will include operational, under construction, consented, and proposed (for those which there is a valid planning application) wind farms as set out in Table 5.2 and illustrated on Figure 5.5 (Appendix B), and the planning status confirmed with the local planning authorities, together with any additional schemes to be considered.
- 5.2.34 The methodology will follow guidance provided by SNH for assessing cumulative effects. The assessment will be supported by cumulative ZTVs. In order that the cumulative assessment remains focussed on other developments that have the greatest potential to give rise to significant cumulative effects it is necessary at the outset to decide which developments need to be considered in detail, as to consider all developments within 30 km of the proposed development would detract attention from the key issues relating to the application. In this landscape and visual context it is considered appropriate and

³ Civil Aviation Authority. 2017. DAP Policy 124: Lighting of Onshore Wind Turbine Generators in the United Kingdom with a maximum blade tip height at or in excess of 150m Above Ground Level. Last updated June 2017.

⁴ NatureScot. 2017. Siting and Designing Wind Farms in the Landscape, Version 3a. Last updated August 2017.

proportionate to scope out all turbines under 50m, and any turbines 100m or less to tip that are located over 10km distance from the Site (as highlighted in grey in Table 5.2 below.

Table 5.2: Cumulative Sites Within 30 km

Wind Farm	Status	Approx distance /direction from Upper Lliw	Turbines Nos/Blade Tip Height metres (BTH)
Alltwalis**	Operational	31.7km	10 turbines /110 m BTH
Brechfa Forest West	Operational	29.6km	28 turbines /145 m BTH
Ffynnon Oer	Operational	17.8km	16 turbines /93 m BTH
Land South of Gelli Las Farm*	Operational	27.9km	2 turbines /45 m BTH
Llynfi Afan Renewable Energy Park	Operational	23.2km	12 turbines/ 118 m BTH
Maerdy	Operational	28.2km	8 turbines/ 145 m BTH
Maesgwyn	Operational	17.2km	14 turbines/ 110 ,120 ,125 m BTH
Mynydd Brombil	Operational	19.8km	4 turbines/ 100m BTH
Mynydd Bwlfa	Operational	27.8km	9 turbines/ 115m, 125m BTH
Mynydd y Bettws	Operational	3.6km	15 turbines/ 110m BTH
Mynydd Y Gwair	Operational	1.1km	16 turbines / 127m BTH
Mynydd Y Gwrhyd	Operational	7.3km	4 turbines / 100m BTH
Newlands Wind Farm*	Operational	25.4km	2 turbines / 77m BTH
Parc Stormy Down	Operational	29.9km	2 turbines/ 105,125 m BTH
Pen Y Cymoedd	Operational	16.4km	76 turbines/143.5 m BTH
Queens Docks*	Operational	12.7km	2 turbines/43,70m BTH
Swansea Bay Wastewater Works*	Operational	11.8km	1 turbine/77m BTH
Abergorki	Consented / Under Construction	28.9km	3 turbines/149.9 m BTH
Cefn Gwrgan Road	Consented / Under Construction	21.1km	1 turbine/ 31m BTH

Wind Farm	Status	Approx distance /direction from Upper Lliw	Turbines Nos/Blade Tip Height metres (BTH)
Foel Trawsnant	Consented / Under Construction	18.6km	11 turbines/ 145m BTH
Land At Kenfig Industrial Estate Margam*	Consented / Under Construction	24.8km	1 turbine/100m BTH
Melin Court	Consented / Under Construction	17.6km	5 turbines/ 149.9m BTH
Mynydd Fforch-Dwm	Consented / Under Construction	15.1km	6 turbines/200m BTH
Tresgyrch Fawd Fawr Road	Consented / Under Construction	3.2km	1 turbine/150m BTH
Upper Ogmere Wind Farm	Consented / Under Construction	25.2km	7 turbines/130,149.9 m BTH
Y Bryn	In Planning	19.4km	18 turbines /206,230,250m BTH
Hirfynydd Renewable Energy Park	Scoping	13.5km	7 turbines/ 200m BTH

*Cells highlighted grey: Turbines less than 50m tall or turbines/turbine clusters less than 100m tall and more than 10km from Proposed Development scoped out of the detailed cumulative assessment.

**Alltwalis shown for context only adjacent to Brechfa Forest West that falls within 30km.

Transboundary and Inter-related Effects

- 5.2.35 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to landscape and visual as a result of the project.

Potential Mitigation

- 5.2.36 Mitigation measures may include:
- avoidance of effects;
 - reduction in magnitude of effects; and
 - compensation for effects (which may include enhancements to offset any adverse effects).
- 5.2.37 The primary mitigation adopted in relation to landscape and visual matters is likely to be embedded within the design of the Proposed Development and will comprise the consideration given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Development layout. This is sometimes referred to as 'mitigation

by design’.

Potential landscape and visual effects

5.2.38 The LVIA will consider the potential effects of the proposed development upon:

- Individual landscape features and elements;
- Landscape character;
- Visual amenity and the people who view the landscape; and
- Landscape designations as appropriate.

5.2.39 Effects during the construction and decommissioning phases are considered to be temporary and would have a short duration. Effects associated with the operational phase of the Proposed Development are considered to be long term effects.

5.2.40 Following the judgement of the sensitivity of the landscape or visual receptor, the LVIA will provide a judgement as to the magnitude of change and the level of the effect experienced by each receptor, along with a statement to clarify whether the effect resulting from the Proposed Development is significant or not.

Matters Scoped out of the Assessment

5.2.41 In order that the assessment remains proportionate and focuses on the key matters that have the potential to bring about significant effects, it is proposed that the following matters are scoped out of the assessment:

- Effects on receptors located outside of the ZTV - the Proposed Development would not result in any effects where there is no predicted visibility;
- Effects during decommissioning - effects during decommissioning would be very similar in nature to those experienced during the construction phase, except in reverse;
- Effects on settlements beyond 15km - due to the distance from the Proposed Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- Effects on public rights of way beyond 15km - due to the distance from the Proposed Development and the limited theoretical visibility there is no potential for receptors to experience significant visual effects;
- Effects on Registered Historic Landscapes (RHLs) – although it is acknowledged that there would be potential for some distant views from several RHLs over 10km from the proposals, the Cultural Heritage scoping chapter has evaluated the potential for significant heritage effects and proposes to scope out all RHLs including Mynydd Myddfai RHL;
- Effects on the Special Landscape Area (SLA) – effects on the SLA’s beyond 15km would be limited and any effects would not be of such a scale so as to undermine the special qualities of the designations.

6 TRAFFIC AND TRANSPORT

6.1 Introduction

- 6.1.1 The Site is located on the hills of Banc Darren-fawr, Banc Myddfai, Banc Maestir-mawr, Mynydd Garn-Fach, and Tor Clawdd surrounding Upper Lliw reservoir, within Swansea Council. Upper Lliw Energy is located to the immediate south of RWE's operational Mynydd y Gwair Wind Farm, with the proposals comprising of 19 wind turbines, with a 162m rotor diameter.

Proposed Delivery Route

- 6.1.2 An initial assessment has indicated that access to Upper Lliw Energy could be taken via the M4, A48, Pant Lasau Road, Mynydd Gelli Wastad Road and Rhydypanyd Road, as illustrated at Figure 6.1. Assessments are ongoing to confirm this delivery route option, including for the delivery of turbine components.
- 6.1.3 Abnormal Load deliveries are likely to originate from the Port of Swansea as the closest port with significant renewables experience, minimising carriage distance on the road network. They will access the M4 at Junction 42 via the Abnormal Load exit from the Port and the A483 Fabian Way.

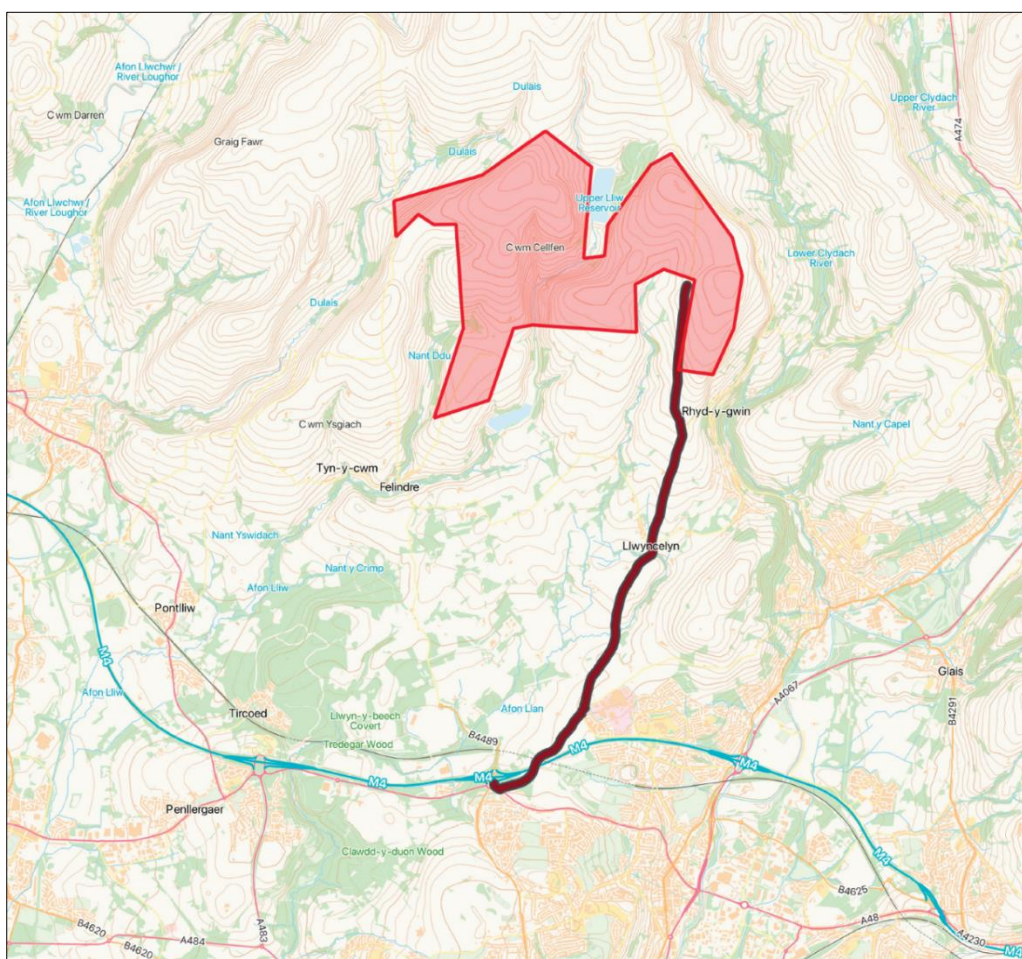


Figure 6.1: Proposed Access Route for Upper Lliw Energy

- 6.1.4 Access for construction and operation for all vehicles will be taken via Junction 46 of the M4, routing via the westbound off-slip onto the A48 / B4489 roundabout.
- 6.1.5 Vehicles will then take the first exit, routing southbound along the A48, before making a left turn onto Pant Lasau Road travelling northeast bound towards Morriston Hospital. Both the A48 and Pant Lasau Road are subject to speeds restrictions of 40mph, with the A48 containing footway provision on both sides of the carriageway, and Pant Lasau Road containing footway provision on one side of the carriageway for its full extent.
- 6.1.6 Vehicles will then navigate the Pant Lasau Road / Heol Maes Eglwys / Mynydd Gelli Wastad Road mini roundabout, proceeding northbound along Mynydd Gelli Wastad Road for a short extent before making a left turn onto Rhydypanydd Road routing northbound. Mynydd Gelli Wastad Road contains street lighting, footway provision on one side of the carriageway and is subject to speed restriction variances upon section, with Rhydypanydd Road subject to various speed restriction variances from 20mph to the national speed limit and lined by hedgerows on both sides of the carriageway.
- 6.1.7 Vehicles will proceed along Rhydypanydd Road for approximately 5km, until reaching the Site access from the south.

6.2 Proposed Scope of Assessment

- 6.2.1 The movement of construction vehicles has the potential to impact upon receptors located along the access routes that may be sensitive to changes in traffic conditions.
- 6.2.2 Guidance on the identification of sensitive receptors is set out in the Environmental Assessment of Traffic and Movement, IEMA, 2023 (the 'IEMA Guidelines').
- 6.2.3 The assessment will identify the sensitivity of affected transport routes, taking into account the presence and location of sensitive receptors or route users. The definition of sensitivity in terms of traffic and transport uses professional judgement, guidance provided in the IEMA Guidelines, and the criteria outlined in Table 6.1 below.

Table 6.1: Sensitivity Criteria

Sensitivity	Definition
Very High	Very high importance and rarity, international scale, very limited potential for substitution. This sensitivity is assigned to the most sensitive receptors. It includes minor rural roads, not designed for HGV use. This includes single-track roads with passing places, rural roads which form on-road cycle routes. It also includes locations where road features are listed structures (e.g. bridges), or locations which were not previously trafficked.
High	High importance and rarity, national scale and limited potential for substitution. This sensitivity is assigned to receptors with a higher level of sensitivity to traffic flows. This includes more rural B roads or, unclassified rural roads, not typically intended to accommodate regular HGV use. This can include traffic calmed roads, traffic signal-controlled roads, or roads with restricted use. For settlements in more rural areas, this includes larger settlements with many local facilities. For other receptors

it includes highly sensitive sites such as schools, playgrounds, retirement homes etc.

Medium	High or medium importance and rarity, regional scale, limited potential for substitution. This sensitivity is assigned receptors with a level of sensitivity to traffic flows. This includes more local A roads, and B roads intended to connect different areas, these roads are suitable for regular HGV use. For settlements in more rural areas, it includes settlements with a level of local facilities. For other receptors, it includes traffic sensitive receptors such as hospitals, community facilities, and recreational facilities.
Low	Low or medium importance and rarity, local scale. This sensitivity is assigned to receptors with lower sensitivity to traffic flows. This includes trunk roads or A roads intended to provide major transport links within or between areas and designed to accommodate HGVs. For settlements in more rural areas, this includes small settlements with few local facilities. For other receptors, it includes sites with some sensitivity to traffic flows, such as open space, conservation areas or residential areas with an existing footway provision.
Negligible	Very low importance and rarity, local scale. This sensitivity is assigned to receptors with low sensitivity to traffic flows, and those distant from impacted parts of the highway network. This includes roads without nearby settlements, including the strategic road network and junctions which are minimally impacted by additional traffic and capable of accommodating abnormal loads. Routes identified by National Highways as "Heavy and High Load Routes" fall within this category. For settlements in more rural areas, it includes locations with isolated dwellings / scattered settlement that lack local facilities. For other receptors, it includes those sufficient distant from impacted highway links and junctions.

6.2.4 The above access route arrangements pass through the residential and built-up areas of Cwmrhydyceirw and Morriston Hospital, where sensitive receptors are located, as well as pedestrian facilities.

6.2.5 Construction vehicles will route past these sensitive receptors; therefore, assessments will be undertaken to identify their sensitivity and the impact of construction vehicles, to determine if there is a requirement for any mitigation and if any significant residual effects could result.

Assessment Categories

6.2.6 Guidance documents relevant to traffic and transport that will be considered within the assessment process include the following:

- Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (2023).
- Design Manual for Roads and Bridges (DMRB), LA 104 Environmental assessment and monitoring.
- Design Manual for Roads and Bridges (DMRB), LA 112 Population and Human Health.

- 6.2.7 Additional vehicle movements generated during construction of the Proposed Development will be determined using first principles, from an understanding of the construction process, likely material quantities and construction programme as the design progresses. These predicted traffic flows will be assessed against forecast future baseline traffic flows to determine any impacts. The scope and duration of predicted impacts will be quantified for each phase of the construction programme.
- 6.2.8 In terms of the assessment of the environmental impacts of traffic and movement, the IEMA Guidelines sets out the following two rules to establish the study area of the of the assessment:
- Rule 1 – Include road links where traffic flows will increase by more than 30% or where the number of Heavy Goods Vehicles (HGVs) will increase by more than 30%.
 - Rule 2 – Include any other specifically sensitive areas where traffic flows will increase by 10% or more.
- 6.2.9 Consistent with the IEMA Guidelines, the following will be considered within the transport assessment:
- Severance.
 - Driver Delay.
 - Pedestrian Delay (including all non-motorised users).
 - Non-motorised user amenity.
 - Fear and Intimidation; and,
 - Road Safety.
- 6.2.10 The environmental effects of road traffic resulting from the construction phase of the proposals will be assessed upon the proposed access route (comprising the M4, A48, Pant Lasau Road, Mynydd Gelli Wastad Road and Rhydypanyd Road), in accordance with the above IEMA Guidelines.
- 6.2.11 Assessments will be undertaken across the typical construction working day of 07:00 to 19:00, including for peak hours and off-peak periods. On any road link where increases in traffic flow are in excess of the threshold, a detailed environmental impact assessment will be undertaken in accordance with the IEMA Guidelines.

Baseline Conditions

- 6.2.12 Once the access route arrangements have been confirmed for delivering the turbine components and the construction related vehicles, a baseline transport position will be established by analysing the existing highway layout and user data along the local road network that makes up the proposed access route. PIA data will be obtained along the access route between the Junction 46 of the M4 and the site access, with traffic survey data being obtained along these roads.

- 6.2.13 To enable the impact of construction traffic to be assessed appropriately, a future year baseline position will be calculated for the peak construction year. Traffic growth rates will be obtained from TEMPro and applied to traffic surveys, and details of any nearby developments that have planning consent but are not yet built out will be obtained from Highway Officers at Swansea Council.
- 6.2.14 Furthermore, any proposed changes or improvements to the highway network will be obtained from Highway Officers at Swansea Council to ensure the access routes are representative of expected future year conditions.

Transboundary and Inter-related Effects

- 6.2.15 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to Transport as a result of the project.

Matters Scoped out of the Assessment

Operational Phase

- 6.2.16 On the basis that vehicle movements generated a renewable energy project when it is operational are irregular, infrequent and very low, no formal assessment of transport effects is necessary during this phase, and this should be scoped out of the assessment.

Decommissioning Phase

- 6.2.17 The decommissioning phase is expected to generate fewer vehicle movements than the construction phase, as elements of infrastructure - such as access tracks - may be retained, and structures may be dismantled onsite to reduce the number of HGV and abnormal load movements.
- 6.2.18 As a result, a detailed assessment of decommissioning traffic is sought to be scoped out of assessment, as its impacts are anticipated to be significantly lower than those of construction.
- 6.2.19 Additionally, given the uncertainty surrounding decommissioning methods in 50 years' time, a traffic assessment will be conducted prior to decommissioning, with appropriate traffic management procedures implemented in line with requirements at that time (circa 2075).

Supporting Documents

- 6.2.20 The Transport ES Chapter will be supported by two additional reports appended to the Chapter. These will provide additional detail on key transport matters, providing information required by key consultees.

Transport Statement

- 6.2.21 A separate Transport Statement report will be prepared and will provide details of the access strategy, the construction traffic generation, the estimated increase upon future year baseline traffic flows and the resultant impact resulting from the proposals. This will provide Highway Officers with all the relevant information needed and will be used to inform the assessments contained with the Transport ES Chapter.

Framework Construction Traffic Management Plan

- 6.2.22 A standalone Framework Construction Traffic Management Plan will be prepared and will detail the access arrangements and routing strategies for both general construction traffic and abnormal load deliveries. It will provide a level of detail suitable for the application stage, in accordance with the 'Pulling Together' guidance. The report will also detail any constraints along the route(s) where remedial actions may be necessary to ensure safe and efficient deliveries, providing a framework of measures to manage the traffic impacts for the construction phase of development.

7 HYDROLOGY AND FLOOD RISK

7.1 Introduction

- 7.1.1 This chapter provide a preliminary assessment of the effects of the Proposed Development with regards to hydrology and flood risk. This assessment focuses on the likely effects of the Proposed Development on local flood risk and water resources, including water quality and flow regimes.
- 7.1.2 This chapter describes the assessment methodology, the baseline conditions currently existing at the Proposed Development Site and in the surrounding area. It also looks at any potential impacts of the Proposed Development and discusses whether further reporting is required to mitigate and reduce any significant adverse effects.

Planning Policy and Legislation

- 7.1.3 The main legislative drivers for the assessment are set out below. All assessment work and surveys should be cognisant of relevant policy, legislation and guidance.

National Policy and Legislation

- Planning Policy Wales, Edition 12
- Technical Advice Note (TAN) 15: Development and Flood Risk (2025)
- The National Strategy for Flood and Coastal Erosion Risk Management in Wales (Wales Government, 2020);
- Sustainable Drainage System Standards for Wales;
- The Water Environment (Water Framework Directive) (England and Wales) Regulations (2017).

Local Policy and Legislation

- Swansea Local Development Plan (LDP) 2010- 2025, February 2019;
- Swansea LDP2 2023-2038, in review April 2025.
- South West Wales Stage 1 Strategic Flood Consequence Assessment, November 2022.

Study Area

- 7.1.4 The hydrology and flood risk study area is shown on Figure 7.1. The study area has been taken as the 19 wind turbine areas, with a 1 kilometre (km) buffer. While details of supporting infrastructure are currently not ascertained, it is expected supporting infrastructure such as haul roads and cable routes will be accounted for within the chosen buffer.
- 7.1.5 The 1 km buffer is considered appropriate for data collection taking into account the nature of the development and likely zone of influence on hydrological receptors. Given the landscape surrounding local land use activities, it would be difficult to ascertain the exact source of any impacts on water quality beyond 1 km.

- 7.1.6 The hydrology and flood risk study area will be reviewed and modified, if necessary, in response to refinements made to the design of the Proposed Development and/or any additional environmental and/or design constraints identified during the EIA process.

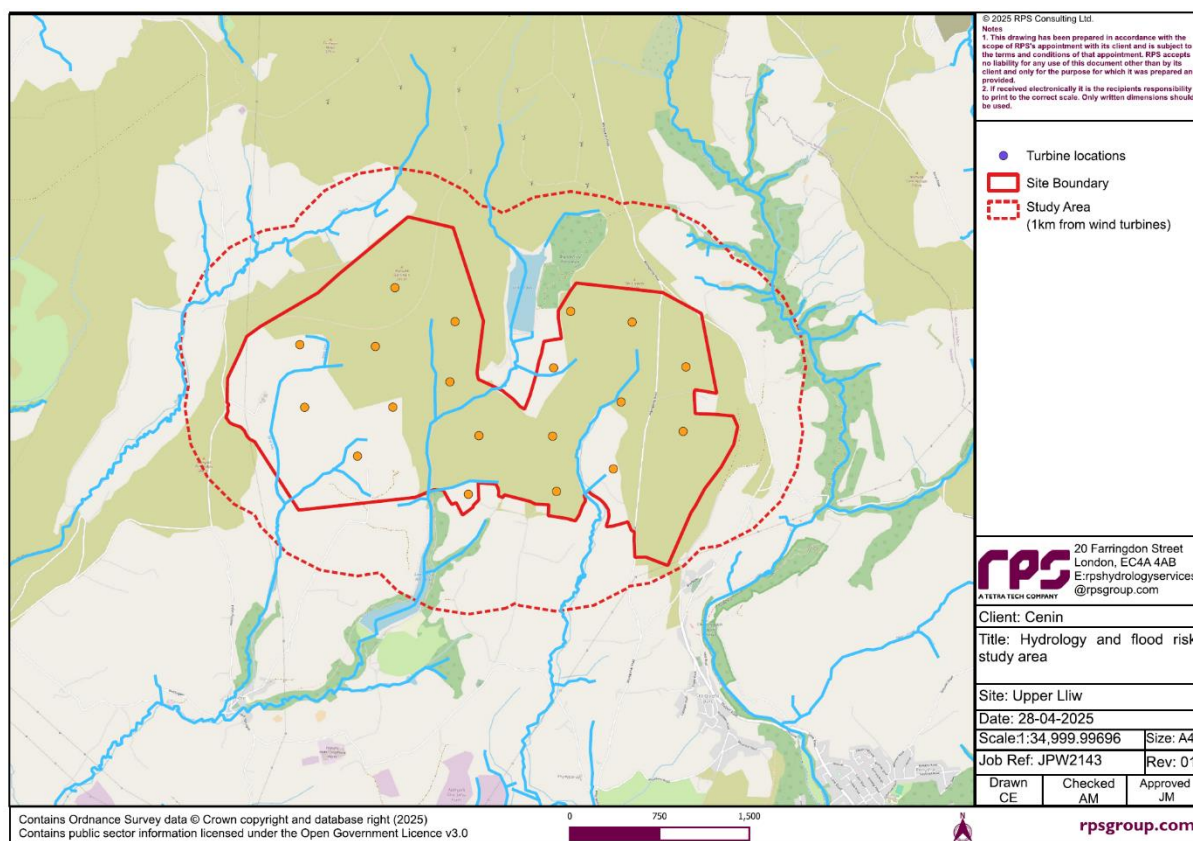


Figure 7.1. Hydrology and Flood Risk Study Area

Data Sources

- 7.1.7 An initial desk-based review of literature and data sources to support this Scoping Report is presented within Table 7.1.

Table 7.1. Data Sources

Data	Author	Data source	Date
OS Mapping	Ordnance Survey (OS)	https://maps.the-hug.net/ (accessed 03/09/2024)	2024
British Geological Society Geology of Britain Viewer 1:50,000 Geological Mapping	British Geological Society (BGS)	https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/ (accessed 03/04/2025)	2024

NRW Flood Map for Planning	Natural Resources Wales (NRW)	https://flood-map-for-planning.naturalresources.wales/ (accessed 03/04/2025)	2025
Data Map Wales	Welsh Government	https://datamap.gov.wales/ (accessed 09/09/2024)	2024
Technical Advice Note 15 (TAN15): Development, flooding and coastal erosion	Welsh Government	https://www.gov.wales/sites/default/files/publications/2025-03/technical-advice-note-15-development-flooding-and-coastal-erosion.pdf (accessed 03/04/2025)	2025

- 7.1.8 In addition to the above data sources, site-specific hydrological data will be obtained via consultation with NRW, Lead Local Flood Authority (LLFA), Envirocheck/Groundsure and site reconnaissance.

Baseline Environment

- 7.1.9 NRW River Basin District Mapping indicates that the study area is within the Western Wales River Basin District.

Watercourses

- 7.1.10 OS Mapping shows there are several ordinary watercourses within the study area, which are denoted within Figure 7.2:
- The River Dulais flows southwest across the northwest extent of the study area, it becomes an NRW designated river just south of the study area boundary;
 - The Afon Lliw runs from north to south through the centre of the site, running through Upper Lliw and Lower Lliw reservoir.
 - Small tributaries ajoin to the Afon Lliw as it runs southwards from Upper Lliw Reservoir in the north of the study area and join Lower Lliw Reservoir in the south.
 - The Nant Ddu and tributaries flow south in the southwest of the study area and outfall to Afon Lliw south of the study area.
 - Several small drains and watercourses are present in the northeast corner of the study area which are tributaries of the Lower Clydach River; and
 - The Afon Llan and associated tributaries flows south in the southeast of the study area.
 - The Afon Llan and associated tributaries flows south in the southeast of the study area.

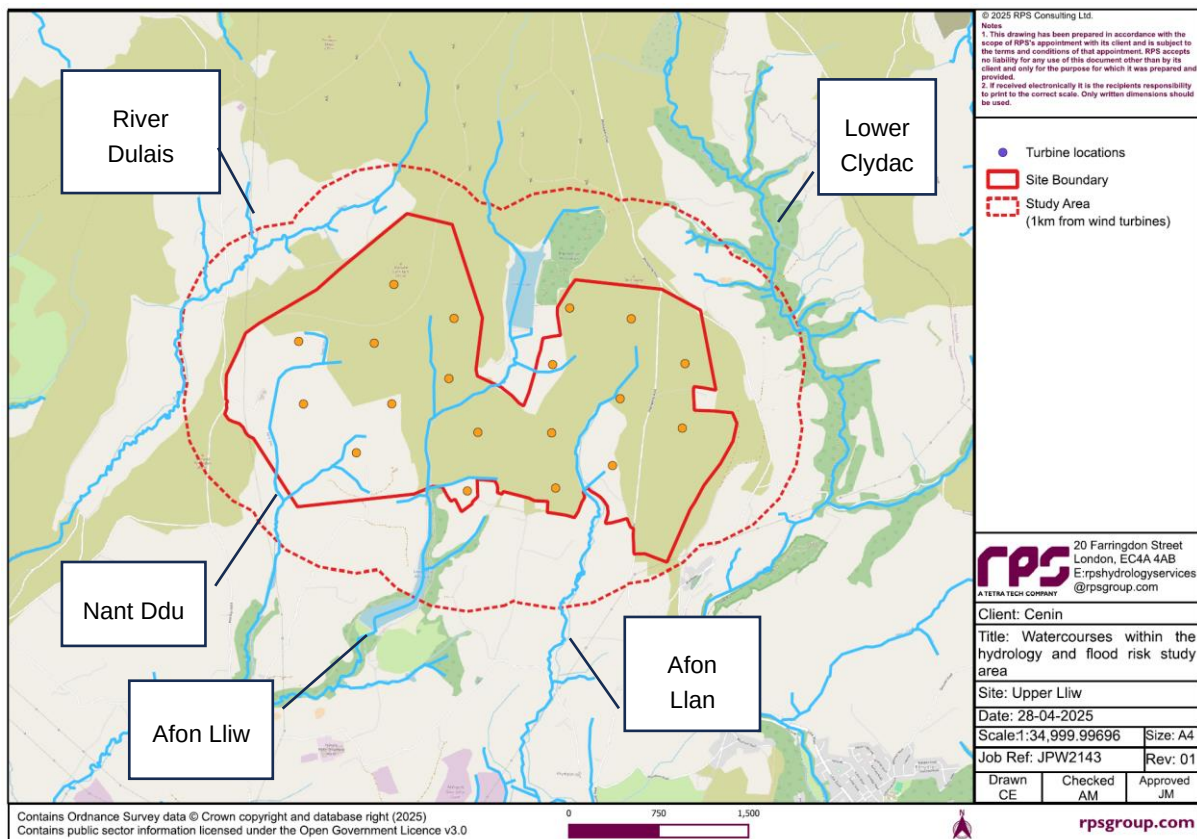


Figure 7.2 Watercourses within the study area

Flood Risk

TAN15 Flood Map for Planning

7.1.11 The NRW Flood Map for Planning is presented within Figure 7.3 and classifies areas into the following zones:

- Flood Zone 1 is defined as areas with an annual probability of flooding of up to 0.1% (1 in 1,000), including the effects of climate change.
- Flood Zone 2 is defined as areas with an annual probability of flooding of between 0.1% to 1% (1 in 1,000 to 1 in 100), including the effects of climate change.
- Flood Zone 3 is defined as areas with an annual probability of flooding of over 1% (1 in 100), including the effects of climate change.

Rivers and sea flooding

7.1.12 The NRW Flood Map for Planning for Rivers and Sea shows all wind turbine locations are located within Flood Zone 1. Areas of Flood Zone 2 and 3 are present within the study area, associated with fluvial flooding from the River Dulais, Afon Lliw, and the Upper Clydach River. Due to the distance inland of the study area, the study area is not considered to be at risk of flooding from the sea.

Surface Water and Small Watercourses

- 7.1.13 The NRW Flood Map for Planning for Surface Water and Small Watercourses shows all wind turbine locations are located within Fluvial Flood Zone 1. Marginal areas of fluvial Flood Zone 2 and Flood Zone 3 associated with flooding from River Dulais, Afon Lliw and Lower Clydach River are present within the study area.
- 7.1.14 Extents of small watercourses and surface water Flood Zone 2 and 3 are also present across the study area, associated overland flow routes and tributaries across the study area.

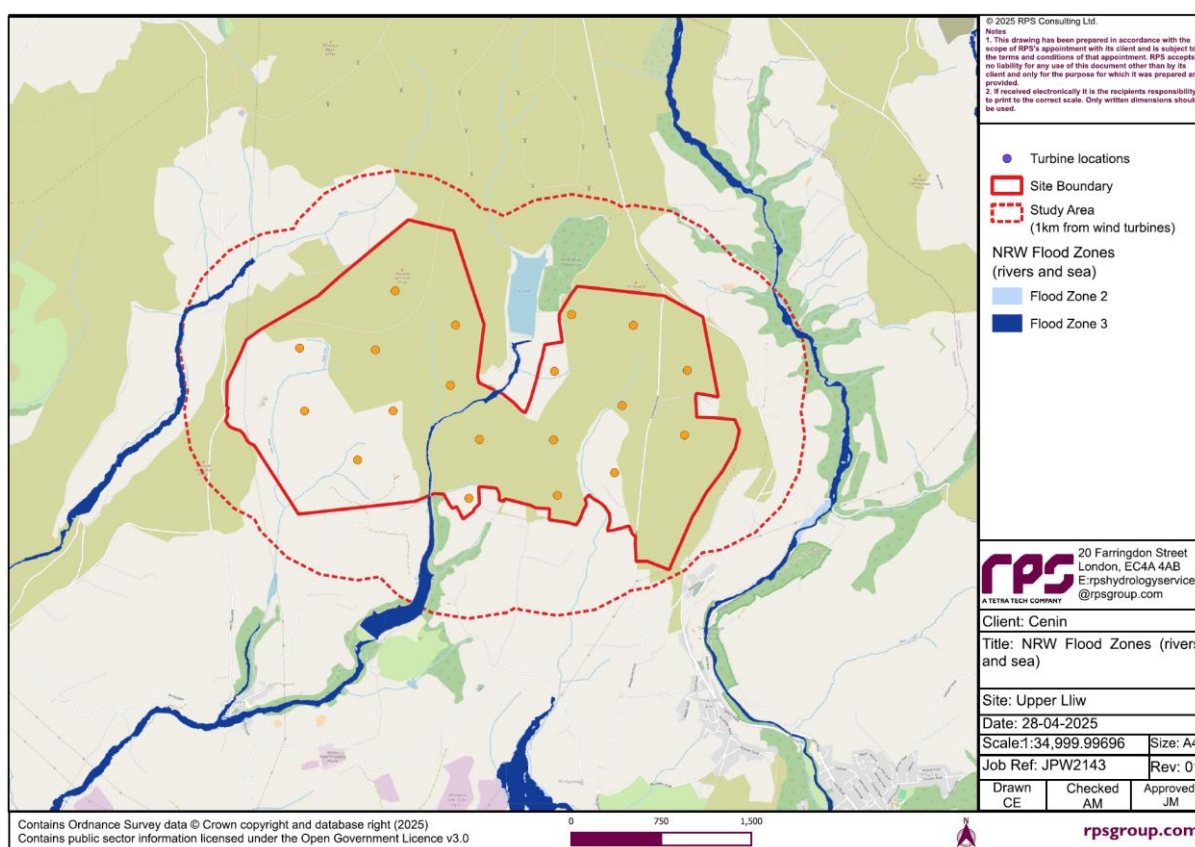


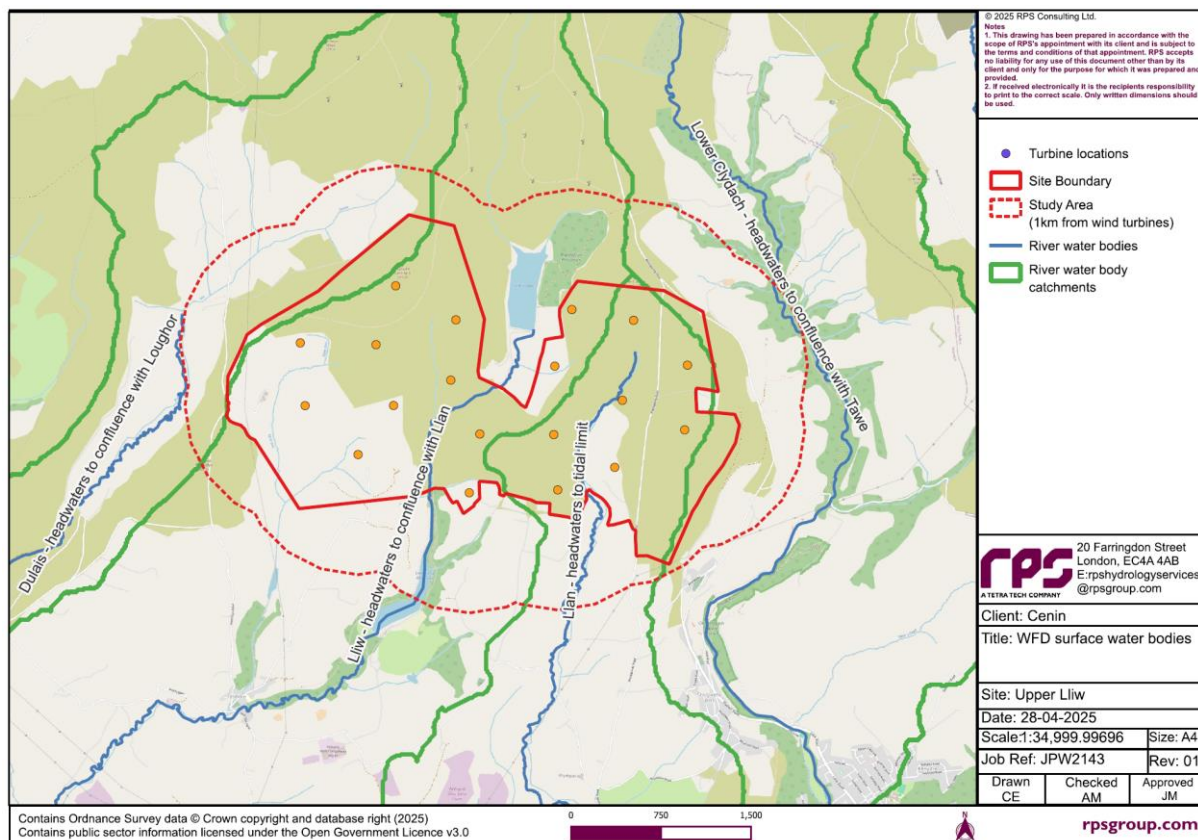
Figure 7.3 Flood Map for Planning

Water Framework Directive

- 7.1.15 Under the Water Framework Directive (WFD), hydrological features often contribute either directly or indirectly to the overall framework designation. All WFD Catchments are tasked with the aim of achieving an overall 'Good' status. Current designations within the Proposed Development's study area are provided in Table 7.2. WFD Catchments are presented within
- 7.1.16 Table 7.4.

Table 7.2. River and Groundwater Waterbody Catchments Cycle 3 2021

Management Catchment	Name	Waterbody ID	Cycle 3 Classification (2021)
Loughor to Taf	Dulais - headwaters to confluence with Loughor	GB110059032080	Moderate
	Lliw - headwaters to confluence with Llan	GB110059032100	Moderate
	Llan - headwaters to tidal limit	GB110059032070	Moderate
Ogmore to Tawe	Lower Clydach - headwaters to confluence with Tawe	GB110059032200	Good
Camarth en Bay and the Gower GW	Camarthen Carboniferous Coal Measures	GB41002G200600	Poor
Tawe to Cadoxton GW	Swansea Carboniferous Coal Measures	GB41002G201000	Poor



Geology and Hydrogeology

Bedrock Geology

7.1.17 The following bedrock strata is present within the hydrology and flood risk study area:

- Hughes Member comprised of sandstone;
- Swansea Member comprised of sandstone;
- Swansea Member comprised of mudstone, siltstone and sandstone;
- Hughes Member comprised of mudstone, siltstone and sandstone.

Superficial Geology

7.1.18 The following superficial deposits are present within the remainder of the hydrology and flood risk study area:

- Devensian Till (diamicton);
- Devensian Glaciofluvial Deposits comprised of sand and gravel;
- Head comprised of clay, silt, sand and gravel;
- Alluvium comprised of clay, silt, sand and gravel; and
- Peat.

Designated Sites

7.1.19 No sites designated as Sites of Specific Scientific Interest (SSSI), Special Protection Areas (SPA) or Special Areas of Conservation (SAC) are located within the Hydrology and Flood Risk study area.

7.2 Proposed Scope of Assessment

7.2.1 The assessment of potential effects on water resources takes account of the impacts of the Proposed Development on the prevailing hydrological, surface water drainage, flooding and water quality environments in order to determine whether there are likely to be significant effects, and whether further assessment should be scoped in.

Relevant Guidance

- National Highways et al (2020) DMRB LA104 Environmental assessment and monitoring,
- CIRIA (C532; 2001) Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors,
- CIRIA (C649D; 2006) Control of water pollution from linear construction projects. Site guide,
- CIRIA (C753; 2015a) SuDS Manual,
- CIRIA (C741; 2015b) Environmental good practice on site guide,

- NRW et al (2020) Guidance for Pollution Prevention (GPP) 1: A general guide to preventing pollution,
- NRW et al (2017a) GPP 2: Above ground oil storage tanks;
- NRW et al (2017b) GPP 4: Treatment and disposal where there is no connection to the public foul sewer,
- NRW et al (2018a) GPP 5: Works and maintenance in or near water,
- NRW et al (2017c) GPP 8: Safe storage and disposal of used oils,
- NRW et al (2000) Pollution Prevention Guidelines (PPG18): Managing Fire Water and Major Spillages,
- NRW et al (2018b) GPP 20: Dewatering of underground Ducts and Chambers,
- NRW et al (2017d) GPP 21: Pollution incident response Plans,
- NRW et al (2018c) GPP 22: Dealing with spills,
- NRW et al (2018d) GPP 26: Safe storage of drums and Intermediate Bulk Containers (IBCs)

Flood Risk Assessment

- 7.2.2 Flood risk will be assessed in line with Planning Policy Wales 12, TAN15 (2025) as well as local planning policy. A Flood Consequence Assessment (FCA) for the site will be prepared, to take into account the impact that the scheme may have on the surface water run-off regime. This will look at the vulnerability to flooding from other sources as well as from river and sea flooding, the potential to increase flooding risk elsewhere and will take into account the effects of climate change.
- 7.2.3 The FCA will be supported by a walkover survey which will identify and record watercourses that have potential to be impacted by the Proposed Development.

Conceptual Drainage Strategy

- 7.2.4 A conceptual drainage strategy will be undertaken to assess pre-and post-development surface water runoff rates and proposal of management techniques to ensure surface water flood risk is not increased as a result of Proposed Development. Measures to prevent a detriment in water quality as a result of the Proposed Development will also be proposed, alongside a brief summary of suggested management and maintenance of proposed Sustainable Drainage Systems (SuDS) during the Proposed Development's lifetime.

Potential Proposed Development Impacts

- 7.2.5 An initial assessment of potential effects associated with the Proposed Development has been undertaken to determine if significant effects are likely, and therefore require further assessment.
- 7.2.6 A range of likely effects on hydrology and flood risk have been identified which may occur during the construction, operation and maintenance, and decommissioning phases of the Proposed Development.

7.2.7 Impacts to be scoped into the assessment are presented within Table 7.3 and impacts to be scoped out are presented within

7.2.8 Table 7.4.

Table 7.3 Hydrology and flood risk Impacts to be scoped in to the assessment

Impact	Justification	Data collection and analysis required to characterise the baseline environment
The impact of increased flood risk arising from additional surface water runoff during the construction phase of the Proposed Development.	Activities required to facilitate the construction of the Proposed Development (e.g. temporary construction compounds, removal of surface vegetation, compaction of soils, excavations, dewatering) may alter drainage patterns and site specific data obtained to inform the surface water runoff rates onsite, increasing the risk of flooding posed to the surrounding area.	Baseline flood risk within the Hydrology and Flood Risk Study Area for the Proposed Development will be determined by undertaking an FCA. mapping data published by NRW and FCA.
The impact of deterioration of water quality via accidental spillages / contaminant release.	Activities required to facilitate the construction of the Proposed Development (e.g. temporary construction compounds, removal of surface vegetation, compaction of soils, excavations, dewatering) may cause direct impacts to water quality via accidental spillages / contaminant release.	Baseline water quality will be determined through a review of the NRW catchment data explorer to identify the WFD classification of watercourses plus groundwater abstraction, pollution incidents and water discharges within the study area.

Table 7.4 Hydrology and flood risk Impacts to be scoped out of the assessment

Impact	Justification
The impact of increased flood risk arising from additional surface water runoff during the operation phase of the Proposed Development.	The operation of the proposed development will result in a minor increase in the total area of impermeable land as a result of the installation of the Proposed Development. The Conceptual Drainage Strategy accompanying the Planning Application will ensure flood risk outside the site is not increased as a result of the Proposed Development. This will be achieved by detailing surface management techniques for surface water runoff arising from new impermeable of the Proposed Development. With the implementation of the drainage strategy, the potential impact of flood risk arising from additional surface water runoff during the operation phase of the Proposed Development is unlikely to result in significant effects and is proposed to be scoped out of the assessment.
The impact of increased flood risk arising from decommissioning.	Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within

Impact	Justification
additional surface water runoff during the decommissioning phase of the Proposed Development.	construction working areas and to require no greater amount or duration of activity than assessed for construction). A Decommissioning Plan will be developed prior to decommissioning in a timely manner and will be in line with the latest relevant available guidance.
The impact of the deterioration of water quality of waterbodies (surface water and groundwater) during the operation phase of the Proposed Development.	Activities associated with the operation phase of the Proposed Development are unlikely to require the transport or storage of harmful substances. Therefore, the potential impact of spills/contaminant releases on the quality of surface water receptors during the operation phase is unlikely to result in significant effects and is proposed to be scoped out of the assessment for hydrology and flood risk. The Conceptual Drainage Strategy accompanying the Planning Application will assess water treatment required to ensure the operation of the Proposed Development does not cause a detriment in water quality. This will be achieved by the proposal of on-site SuDS to provide adequate surface water treatment of surface water run-off arising from new impermeable areas as a result of Proposed Development.
The impact of the deterioration of water quality for construction (i.e., any activities are likely to occur within of waterbodies (surface water and groundwater) during the decommissioning phase of the Proposed Development.	Decommissioning is likely to operate within the parameters identified for construction (i.e., any activities are likely to occur within of waterbodies (surface water and groundwater) during the decommissioning phase of the Proposed Development). A Decommissioning Plan will be developed prior to decommissioning in a timely manner and will be in line with the latest relevant available guidance.

Embedded Mitigation Measures

7.2.9 Measures adopted as part of the Proposed Development will include:

- Preparation of a FCA due to the overall size of the site being in excess of 1 ha, to accompany the planning application.
- Preparation of a Conceptual Drainage Strategy to accompany the planning application,
- Undertaking of a hydrology site walkover to identify and record watercourses that have the potential to be impacted by the Proposed Development,
- Consultation with NRW and Swansea Council to obtain any flood risk and water quality information required to inform the baseline of the hydrology and flood risk chapter.
- Relevant permits and consents will be obtained from NRW and Swansea Council prior to construction, these would include land drainage consents, as required.

- Development of construction and operation mitigation measures. Construction phase mitigation would be implemented through the Construction Environmental Management Plan (CEMP).
- A Decommissioning Plan would be produced and agreed with the relevant authorities prior to decommissioning works and will be in line with the latest relevant available guidance. The Decommissioning Plan would consider in detail all potential environmental risks on the site and contain guidance on how risks can be removed or mitigated. This would include details of how surface water drainage should be managed during the decommissioning, and measures to prevent pollution, including emergency spill response procedures, and clean up and remediation of contaminated soils, where identified.

7.2.10 The requirement and feasibility of additional measures will be dependent on the significant effects on hydrology and flood risk.

Further Mitigation Measures

7.2.11 All construction work would be undertaken in accordance with the CEMP and good practice documentation including, some of which have been withdrawn, but still provide a useful guidance and principles:

- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532; 2001).
- CIRIA – SuDS Manual (C753; 2015a).
- CIRIA (C741; 2015b) Environmental good practice on site guide.
- Prevent surface water being affected during earthwork operations. No discharge to surface watercourses would occur without permission from NRW (SuDS Manual).
- Wheel washers and dust suppression measures to be used as appropriate to prevent the migration of pollutants (SuDS Manual).
- Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual).
- A construction method statement to be submitted for approval by the responsible planning authority (SuDS Manual).

7.2.12 All construction will also include the following:

- Construction drainage systems to ensure that discharge from the Proposed Development is controlled in quality and volume during construction.
- Construction techniques and processes to ensure the protection of surface and ground waterbody quality and flow and to prevent an increase in flood risk, such as dust prevention techniques, location of construction compounds, storage of materials (including storage of hazardous materials) in relation to water bodies.
- Best practice construction techniques and design would be used for any excavations during the installation of foundations. Dewatering to be undertaken when required, and should contamination be encountered during excavation, work would be stopped until appropriate measures are in place to prevent mobilisation.

- Pollution Prevention Measures to prevent spillages and contamination of surface and ground waterbodies during construction. This includes appropriate storage/containment of materials (including hazardous substances), plant in addition to appropriate refueling methodology. The Pollution prevent plan will also detail information regarding spillkits and actions to be undertaken if a spillage were to occur.
- Water quality monitoring would be carried out throughout the construction phase to ensure no discharge of pollutants or increase in suspended sediment occurs.

Potential Cumulative Impacts

- 7.2.13 There is potential for cumulative effects to occur on receptors between the Proposed Development and other developments. The potential cumulative effects of the Proposed Development together with other developments with respect to hydrology and flood risk will be considered within the ES.

Potential Inter-Relationships and Transboundary Effects

- 7.2.14 The assessment of inter-relationships will be considered within the water quality and flood risk section of the ES. It will include consideration of Proposed Development lifetime effects and receptor-led effects, in line with the approach outlined in Section 3: EIA Methodology of this EIA Scoping Report. There are potential inter-relationships with other topics, relating to the pollution of watercourses during construction, albeit the impacts are likely to be not significant owing to embedded mitigation measures.

8 GEOLOGY AND HYDROGEOLOGY

8.1 Introduction

- 8.1.1 The presence of contamination in land can present risks to human health and the environment, which adversely affect or restrict the beneficial use of land. Without appropriate mitigation, the presence of substances with potential to cause harm to human health, property and the wider environment may severely limit or altogether preclude development and the beneficial use of land.
- 8.1.2 Similarly certain ground conditions can be a cause of land instability, either as a result of natural processes or as a result of historical anthropogenic activities such as mining or excavation, resulting in landslides or slips, soil creep, and ground compression.
- 8.1.3 The assessment will be based on the findings of a Phase 1 Ground Conditions report, which will have due regard to current legislation and to comply with relevant principles and requirements of a range of guidance.
- 8.1.4 In addition, it is known that the development Site is located above a Mineral Safeguarding Area (MSA), designated by the county Mineral Planning Authority (MPA). The MPA may object any nonmineral development considered to sterilise those safeguarded mineral resources. A Mineral Resource Assessment will therefore be required in support of the proposed development.

8.2 Proposed Scope of Assessment

Baseline Data Collection

- 8.2.1 A Phase 1 Ground Condition Assessment (desk study and Site walkover) will identify potential environmental and geotechnical liabilities associated with the Proposed Development, including an assessment of potential impacts of previous uses of the Site and surrounding area.
- 8.2.2 In undertaking the desk study, all available information on the Site and surrounding area will be reviewed to establish local ground conditions and environmental settings. Furthermore, consultation will be held with the local authorities, the Coal Authority and Natural Resource Wales to obtain any other environmental records available for the Site and to further refine the assessment methodology.
- 8.2.3 The baseline data collection approach will be undertaken to develop a clear understanding of the following:
 - Previous land uses through a review of historical maps;
 - Underlying ground conditions through a review of BGS maps, and a review of previous Site investigations (where available);
 - The presence of potential Coal workings; and
 - Existing physical baseline conditions through a Site walkover survey and review of a commercially available environmental database report.

- 8.2.4 The environmental database report will identify groundwater vulnerability, Sites designated for geological importance, details of any previous pollution events, details of landfills, waste management Sites and potentially hazardous activities within the Project Site and surrounding area.
- 8.2.5 The Phase 1 report will determine potential environmental impacts, assessed qualitatively using a “source —pathway —receptor” approach to identify potential pollutant linkages. A conceptual Site model approach will be used to assess the risks posed by contaminants to sensitive receptors using a source, pathway receptor model, based on the following:
- Source —potential source of contamination;
 - Pathway —means by which contamination can reach and impact upon a receptor; and
 - Receptor —that which may be adversely affected by the presence of contamination.
- 8.2.6 In relation to ground stability risks the conceptual model will establish the likely nature of the ground conditions and the effect that both the proposed development will have on issues such as slope stability, collapsible ground, as well as identify potential risks to development as a result of ground conditions such as settlement/ heave or aggressive ground conditions due to chemical composition.
- 8.2.7 Based on the findings of the desk studies, Site walkovers and preliminary risk assessment, recommendations will be provided for subsequent intrusive Phase 2 investigation work required to satisfy current standards and guidance and fill any data gaps identified to fully inform the assessments of environmental and geotechnical risks or liabilities, and to provide information to enable the subsequent detailed design of foundations and infrastructure.
- 8.2.8 The land quality and geotechnical aspects of this assessment shall be carefully coordinated to ensure that these issues are not dealt with in isolation and instead incorporated holistically into the assessment.

Geographical and temporal Scope

- 8.2.9 The assessment is in part based on published information which is generic to an area rather than specific to the application land. Where this is the case professional experience has been used to inform the assessment in terms of likelihood and scale of contamination associated with the identified land uses.
- 8.2.10 The Study Area for this assessment comprises the Site and immediate (adjoining) land for identification of specific current and historic land uses. Depending on the type of data a search radius of between 250 m and 1 km is used depending on the zone of influence, for example only landfill Sites within only 250 m of the Site boundary will be identified as because gas migration is unlikely over a greater distance.
- 8.2.11 The assessment will consider both the current geotechnical geomorphological and land use condition of the Site and will through the assessment of readily available Ordnance Survey historical mapping consider the previous land use and setting of the Site.

Assessment of effects

- 8.2.12 The significance of likely effects during construction and completion of the Proposed Development will be assessed by consideration of the sensitivity of the key attributes of the receptors that may be affected and the magnitude of the predicted impact on them. The assessment will consider the likelihood of harm occurring, taking into account potential sources of contamination, ground stability and receptors.
- 8.2.13 This will be in accordance with the assessment matrix and methodology outlined within the remainder of this section. For the purposes of this assessment any effect that is moderate or above will be considered to be significant in EIA terms.

Sensitivity of potential receptors

- 8.2.14 The sensitivity of potential receptors will be qualitatively described and categorised based on the terminology in Table 8.1 below.

Table 8.1: Receptor Sensitivity Criteria

Sensitivity	Typical Descriptors	Examples
High	High importance or rarity, and limited potential for substitution.	On site future site occupants e.g. future site users through chronic exposure to contamination Principal aquifer with licensed groundwater abstractions Excellent quality surface water bodies
Medium	Medium importance and rarity, limited potential for substitution	Off-site future site occupants e.g. general public on adjacent Sites Secondary A aquifer Good quality surface water bodies
Low	Low importance or rarity	Secondary undifferentiated aquifer Satisfactory quality surface water bodies
Negligible	Very low importance and rarity	Unproductive strata Poor Quality surface water bodies

Magnitude of Impact

- 8.2.15 The magnitude of potential impacts will be qualitatively described and categorised based on the terminology in Table 8.2 below:

Table 8.2: Impact magnitude criteria

Magnitude	Criteria	Example / Description
High	Results in loss of attribute and likely to cause exceedance of statutory objectives and/or breaches of legislation	Category 1 – Soil contamination that could result in a ‘contaminated land’ designation under part 2a, i.e. significant possibility of significant harm to human health or controlled waters, Or, A change of planning use deems that the concentrations of contaminants in the land may be harmful to receptors. Remedial action under part 2a will be required, Or, Loss of resource of severe damage to characteristics, features or elements e.g. of a geologically designated site
Medium	Results in impact on integrity of attribute or loss of part of attribute possibly with / without exceedance of Statutory objectives or with / without breaches in legislation.	Category 2 – Soil contamination that could provide a strong case for considering that the risks are of a significant concern so as to be designated as ‘contaminated land’ designation under part 2a. Or, A change of planning use deems that the concentrations of contaminants in the land may be harmful to receptors. Remedial action under part 2a will be required on a precautionary basis, Or, Partial loss of / damage to characteristics, features or elements e.g. of a geologically designated site.
Low	Results in minor impact on attribute	Category 3 – Soil contamination that could arise but the concentrations would not be considered significant or there is a low likelihood of serious pollution, Or,

Magnitude	Criteria	Example / Description
		A change of planning use deems that the concentrations of contaminants in the land are not capable of harming receptors, Or, Minor damage to characteristics, features or elements e.g. of geological feature of interest
Negligible	Results in no discernible change or an impact on attribute of insufficient magnitude to affect the use / integrity	Soil contaminants present, but risk assessment suggests negligible / low risk to human health, Or, Very minor damage to characteristics, features or elements e.g. of geological feature of interest.

Significance of effect

- 8.2.16 The significance of an effect will be determined from the predicted magnitude of an impact and the sensitivity of the receptor using the methodology set out in Section 3 of this Scoping Report.

Baseline Information

- 8.2.17 The following preliminary risk assessment has been undertaken to characterise the baseline of Upper Lliw in relation to geotechnical, geoenvironmental and land stability conditions.
- 8.2.18 The site is centred at NGR 265000 205700 and is at a maximum elevation of approximately 280m. A.O.D.
- 8.2.19 The majority of the land is undulating open heathland, with areas which have been given over to farmers fields, predominantly for livestock.

Geology

- 8.2.20 Made Ground is unlikely to be present across the Site due to limited record of construction and/or demolition activities.
- 8.2.21 Published data indicates the site to be underlain by superficial deposits comprising peat and glacial till, which in turn are underlain by bedrock of the Upper Coal Measures, with several coal seams.

Environmental Setting

- 8.2.22 Given its setting and history it is considered that the likelihood of existing soils being contaminated is considered to be low. The risk of contamination migration from off-Site sources including historical mines/coal measures, and current on-site peat sources, is not considered to be significant risk to human health and water resources.

Coal mining

- 8.2.23 A Coal Mining Risk Assessment (CMRA) has been undertaken on a preliminary layout and is enclosed at Appendix G. The CMRA will be updated based on the final site layout, however, it is provided with this Scoping Report to provide baseline information. The CMRA includes a Consultants Report obtained from the Coal Authority.
- 8.2.24 The Consultants Report states that there are recorded underground mine workings of various coal seams beneath the area, the shallowest being within the No3 Swansea at a depth of 9m, dipping at 6 degrees to the south, and last mined in 1970 being 190mm thick.
- 8.2.25 The Coal Authority (C.A) have numerous records of mine entries within the search area.
- 8.2.26 The C.A. have not received any damage notices or subsidence claims for any property within 50m since October 1994 (i.e. since the formation of the C.A. to take liability for legacy mining issues). There are no records of gas emissions requiring action within 500m.
- 8.2.27 There are no present underground workings or plans for any. There are no Section 46 notices or withdrawal of support notices.

Minerals

- 8.2.28 A detailed review of mineral planning policy and Site setting information will be undertaken to confirm the scope required for the mining supporting information and / or investigation works that may be required. The baseline assessment will comprise a review of the data presented within a Phase 1 report to establish a ground and groundwater model for the Site confirming the likely distribution and thickness of safeguarded minerals.

Further Geotechnical and Geoenvironmental Baseline Studies

- 8.2.29 It is considered that the baseline conditions can be adequately assessed as set out above and that no further data collection or technical assessment is required in support of the EIA, and that further investigation and assessment of the need for mitigations can be conditioned prior to development.
- 8.2.30 This is considered a proportionate risk management approach to address the risk in the highest risk areas of the Site.

Minerals Resource Assessment (MRA)

- 8.2.31 A MRA will be undertaken to identify whether protected mineral resources are present beneath the Site and the constraint(s) those reserves are likely to place on the Proposed Development in light of local mineral planning policy. The MRA will include:

- An appraisal of the mineral resources likely to be present beneath the Site in terms of the quantity, quality and spatial extent across the Site and in relation to areas potentially sterilised by the Proposed Development;
- The viability and practicability of mineral extraction, in light of local constraints (buffers) to potential extraction and / or for prior extraction; and
- An assessment against mineral planning policy, including determination of any mitigations likely to be required to meet planning policies.

8.2.32 Based on the findings of the MRA, the significance of this potential constraint on Site development shall be assessed. Where required, mitigations and / or additional works shall be identified through the investigation.

8.2.33 The CMRA and MRA will be submitted as standalone reports as part of the planning application.

Potential Proposed Development Impacts and Mitigation

8.2.34 The Proposed Development may induce a series of potential adverse impacts upon the baseline hydrogeology and geological environment within the vicinity. Impacts may arise during the construction, operation and decommissioning phases.

Construction Impacts

8.2.35 During construction works, potential sources of contamination may be introduced to the Site on a transient basis, including fuel storage for construction plant, bulk cement and more minor storage and use of construction products. Impacts, provided that these materials are properly controlled, are not expected.

8.2.36 A CEMP will be prepared to set out best practice methods of limiting impacts during construction. Embedded mitigation measures would include adherence to good practice guidelines and could potentially involve the following:

- Soils which are to be reused on Site would be tested for contamination and geotechnical suitability. This would form part of a Site materials and waste management strategy which would be drafted prior to construction and would focus on the re-use, recycling and reduction
- of waste spoil;
- Any additional construction materials that are to be imported to the Site would be required to have certification of their chemical concentrations to ensure that contaminative materials are not being introduced to the area;
- In order to limit disturbance, Site access tracks and defined compound areas would be constructed first to allow controlled movement of vehicles around the Site;
- Any vegetation, topsoil and subsoil would be removed to expose a suitable sub-grade. Any soils, sub-soils or aggregate suitable for reuse would be stockpiled appropriately;
- Stockpiles will be Sited a minimum distance from watercourses to avoid pollution runoff;

- Surface water, perched waters or groundwater from dewatering operations would not be discharged to surface water, foul or surface water drains without the appropriate consents from the local water or sewage company and/or the Environment Agency. The disposal of this effluent would be the responsibility of the contractor. If necessary, this water would be tanked off-Site for disposal at a suitable facility;
- During construction, no untreated surface or waste waters would be allowed to drain into water bodies during construction, operation or decommissioning.
- All oil and chemical storage tanks and areas where drums are stored would be surrounded by an impermeable bund sized to contain 110% of capacity. In addition, multiple tanks or drums would be within bunds sized to contain the greater of 110% of the capacity of the largest tank or 25% of the total tank's contents.
- All foundations would be appropriately specified to resist chemical attack from soils or groundwater; and
- Foundations and underground infrastructure would also be designed so as not to present a preferential pathway for contaminant migration, if present at the subject Site.

8.2.37 Further, specific mitigation measures could include, for example; removal of contamination hotspots or further Site characterisation Site investigation, development and agreement of remedial strategies with regulatory authorities, to deal with unforeseen ground conditions will be determined during the EIA.

Operational Impacts

- 8.2.38 The potential impacts arising from the operation of the Site would primarily be through the accidental release of pollutants. The long-term potential impacts of the infrastructure include an increase in impermeable areas which may impact upon Site runoff, and if inappropriately designed, infrastructure may lead to sediment generation from concentrated runoff points.
- 8.2.39 The construction of the turbines, any ancillary buildings, roads and other hard-surfaced areas will also have the potential to reduce the infiltration of precipitation into the soils, and consequently the baseflow contribution to the small watercourses. The impact on groundwater with regard to abstraction is unlikely to be significant, given the limited impermeable cover proposed.
- 8.2.40 The Proposed Development is not expected to impact on groundwater, provided any imported fill material required as part of the Site development is adequately characterised as suitable for use with respect to contaminants.
- 8.2.41 Impacts would be avoided as far as possible through the design process, and where this is not possible appropriate mitigation measures would be implemented to ensure potential impacts are minimised. A hierarchy of mitigation strategies will be devised following best practice guidelines including the Pollution Prevention Guidelines, the Water Framework Directive, and relevant NRW policies. Mitigation measures include appropriate drainage design, the use of runoff and sediment control measures where necessary and through the implementation of good working practice. The use of specific mitigation measures will be specified for every potentially significant effect identified in the ES.

- 8.2.42 Ongoing contamination impacts to imported materials or maintenance works following development are not expected.
- 8.2.43 Ongoing geotechnical impacts are considered unlikely given that the matters identified will be subject to detailed assessment and design following targeted ground investigation.

Residual Effects

- 8.2.44 The use of appropriate mitigation measures will reduce the potential impacts on this Site from the Proposed Development. It is anticipated that all potentially significant effects will be mitigated via these measures and will not result in a significant residual impact.

Cumulative Effects

- 8.2.45 An assessment of cumulative effects will be considered within the ES Chapter and will be assessed on a catchment basis. The size of the draining catchments and the proximity to current or proposed developments will be assessed to determine the likely cumulative impacts on the local environment. The assessment will consider potential contamination within other local Sites to evaluate the risks and significance of effects posed by those developments.
- 8.2.46 Following the assessment, any identified requirement for remediation should be completed prior to the start of, or as a justified part of, the construction phase. Accepting that other proposed developments in the area around the Site are adequately assessed, remediated and mitigated, they should themselves result in no significant adverse effects, and it is therefore considered that there would be no measurable cumulative effects.

Transboundary and Inter-related Effects

- 8.2.47 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to ground conditions as a result of the project.

9 BIODIVERSITY

9.1 Introduction

- 9.1.1 This section of the Scoping Report sets out the proposed approach to the assessment of construction, operational and decommissioning effects of the proposed Upper Lliw Energy Project (the Site) on ecological features.

Site Description and Context

- 9.1.2 The Site is characterised by unenclosed, exposed common land with upland acid grassland being the dominant habitat. Farmland of improved grassland and non-cereal crops⁵ enclosed by earth banks and hedgerows is present in the western part of the Site. Other habitats within the Site include watercourses, upland heathland, lowland mixed deciduous woodland, scrub, bracken and upland flushes, fens and swamps. Figure 9.1 (Appendix C) shows the Site boundary and the location of statutory and non-statutory sites.
- 9.1.3 Graig Fawr Site of Special Scientific Interest (SSSI) lies 1 km north west of the Site. The SSSI is notified for supporting good examples of a range of plant communities including both wet and dry acidic grasslands and soligeneous⁶ mires.
- 9.1.4 The Carmarthen Bay and Estuaries Special Area of Conservation (SAC) lies 6.4 km south west of the Site⁷. The SAC is a large site with multiple ecological features and encompasses the estuaries of the Rivers Loughor, Tâf and Tywi (coastal plain estuaries) and the Gwendraeth (a bar-built⁸ estuary). Extensive areas of intertidal mudflats and sandflats with high densities of bivalves are present. The Burry Inlet and Three Rivers system provides a migratory route for salmonids, and also lamprey and shad species. For its qualifying habitats and species, the SAC is considered to be one of the best areas in the UK for; estuaries, mudflats and sandflats not covered by seawater at low tide, Atlantic saltmeadows, *Salicornia* and other annuals colonising mud and sand, large shallow inlets and bays and sandbanks which are slightly covered by sea water all the time, and fish species including shad *Alosa* spp., river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus* and otter.
- 9.1.5 Burry Inlet and Loughor Estuary SSSI lies 6.4 km south west of the Site This SSSI is the largest estuarine complex within the old West Glamorgan County and Borough of Llanelli. Comprising extensive areas of grazed saltmarsh, sand and mud flats, the area is internationally significant for its waterbird populations with overwintering totals more than 46,000 birds.
- 9.1.6 There are eleven Sites of Importance for Nature Conservation (SINC) within 2 km of the

⁵ Kale *Brassica oleracea*

⁶ Formed by water flow horizontally through the soil, usually on a hillside.

⁷ 6.4 km is the shortest straight line distance from the Site to the SAC. The distance that water travels from the site to the SAC is up to three times greater, depending on the catchment.

⁸ Drowned river valleys with a sediment bar across their mouths.

Site.

- 9.1.7 The Banc Darren Fawr SINC covers most of the Site. The SINC covers 2085 ha and its habitat features consist of woodland containing an assemblage of ancient woodland indicator (AWI) species, structurally diverse and species rich scrub, gorse stands, relatively species-rich neutral grassland, upland wet and dry heath, upland fens, marshes and swamps, lowland fen, species rich purple moor-grass and rush pasture, blanket bog, watercourses with erosion features, species rich bracken communities and semi-natural upland block. This site has 69 species features including common toad (a priority species) and 30 species of priority invertebrate species (all lepidoptera).

Baseline Survey Information

Habitats

- 9.1.8 A UKHab habitat survey was completed covering part of the Site (the Survey Area) in 2024⁹ (see Figure 9.2 (Appendix C)). The Survey Area was dominated by upland acid grassland in its unenclosed parts. Upland flushes, fens and swamps were occasionally found across the Survey Area within grassland habitats. Three small areas of transition mire and quaking bog were present in the western part of the Survey Area and one larger area was found in the eastern part. The western part of the Survey Area also contained enclosed fields of non-cereal crops and modified and other neutral grassland, with fenced hedgerows and earth banks supporting other lowland acid grassland, as field boundaries. Lowland mixed deciduous woodland and mixed and gorse scrub was found in the south western part of the Survey Area, and small patches of upland heathland were found in the eastern part of the Survey Area.
- 9.1.9 Five priority habitats¹⁰ were identified within the Survey Area during the UKHab survey. Upland flushes, fens and swamps (including the Annex 1¹¹ habitat transition mire and quaking bog) were present on the slopes adjoining the plateaus. Upland heathland occurred in small patches and had a sparse distribution across the Survey Area. A stand of lowland mixed deciduous woodland was present within farmland in the western part of the site, as were hedgerows which enclosed agricultural fields. A reach of stream in the eastern part of the Site was identified as a headwater, part of the rivers Habitat of Principal Importance.

Bats

- 9.1.10 Automated detector surveys identified a minimum of eight bat species using the Site in 2024. Species present were common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*, long-eared bat species *Plecotus* sp¹², greater horseshoe, lesser horseshoe, *Myotis* species (one or more), noctule *Nyctalus noctula* and Leisler's bat *Nyctalus leisleri*. Suitable roosting habitats for bats within the Site are principally in the western part of the Site, where there are farm buildings and

⁹ Further habitat surveys to cover remaining parts of the developable area are planned for 2025.

¹⁰ Those listed under Section 7 of the Environment Wales Act (2016)

¹¹ Annex 1 of the Habitats Directive (The Conservation of Habitats, Flora and Fauna, 92/43/EEC)

¹² All long-eared bat species records were likely to be brown long-eared bat.

an area of broadleaved woodland. In the wider landscape, there are roosting opportunities in buildings and woodland, which is reflected by historic roost records identified by a desk study.

- 9.1.11 Data indicate (through the number and timing of early bat passes) that a common pipistrelle roost may be located within or close to the Site which is used by the species throughout the active season. A mating or transition roost of soprano pipistrelle and noctule was also indicated by small numbers of passes within typical mean emergence times.
- 9.1.12 The Site is considered to be of low value to foraging bats overall, with the results from the field survey suggesting that the most valuable habitats for foraging bats (woodland edge) are located in the western part of the Site.
- 9.1.13 The total bat activity recorded at each detector location during 2024 is illustrated on Figure 9.3 (Appendix C). The likely value of the Site as a roosting resource will be determined following proposed roost surveys in 2025. Roost survey methods will be in accordance with Bat Conservation Trust guidance (Collins, 2023¹³).

Otter and water vole

- 9.1.14 Targeted otter and water vole surveys were undertaken in 2024.
- 9.1.15 A desk study identified that otter are known to use the Upper and Lower Lliw Reservoirs, which are adjacent to the Site boundary. The Afon Lliw provides a suitable commuting and foraging route between the two waterbodies. Evidence was also found of otter activity on a small watercourse which connected to the Upper Lliw Reservoir and a further small watercourse forming the upper reaches of the Afon Llan. It is considered likely that otters periodically use watercourses throughout the Site for foraging and commuting.
- 9.1.16 Water vole evidence in the form of droppings, feeding remains and footprints was recorded in watercourses forming the upper reaches of the Afon Llan in the eastern part of the Site.

9.2 Proposed Scope of Assessment

Legislation, policy and guidance

- 9.2.1 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Site.
- 9.2.2 Particular consideration has been given to habitats and species listed under Annexes 1 and 2 of the Habitats Directive (92/43/EEC), Schedules 5, 8 and 9 of the Wildlife and Countryside Act 1981 and Section 7 of the Environment Wales Act (2016) in deriving the detailed approach to the work.
- 9.2.3 Consideration has also been given to national and local policy, including Planning Policy

¹³ Collins, J (ed). 2023. *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, 4th Edition. The Bat Conservation Trust, London.

Wales (PPW) 12¹⁴, Technical Advice Note (TAN) 5 Nature Conservation and Planning¹⁵, Future Wales (The National Plan 2040), the Swansea Council Local Development Plan (LDP)¹⁶ in informing the proposed assessment scope.

9.2.4 The approach to the collection of ecological data is based on industry standard guidance. For example, UKHab habitat survey was completed in accordance with the approach outlined by UKHab Ltd (2023)¹⁷. Bat survey followed NatureScot et al. (2021)¹⁸ and otter and water vole survey was based on approaches outlined by Chanin (2003)¹⁹ and Dean et al. (2016)²⁰ respectively.

9.2.5 The approach to the ecological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance (2019)²¹.

Study area

9.2.6 The study area for the desk study extends to 2 km beyond the Site for most ecological features²², but to 10 km for bats (and sites designated for their bat populations).

9.2.7 Ecological survey work has been focused within the Site.

Desk Study

9.2.8 A desk study was completed in April 2023. This included a review of aerial imagery, Ordnance Survey maps and the UK Government's 'Magic' website²³ to broadly assess habitat types and connectivity, and a review of species and non-statutory site data from the South East Wales Biodiversity Records Centre (SEWBReC). The search area extended to 2 km around the Site (10 km for bats). This helped inform the approach to survey work. The

¹⁴ Welsh Government (2024). Planning Policy Wales, Edition 12.

¹⁵ Welsh Government (2009). Technical Advice Note (TAN) 5: Nature Conservation and Planning.

¹⁶ Swansea Council. Swansea Local Development Plan 2010 – 2025.

¹⁷ UKHab Ltd (2023). UK Habitat Classification Version 2.0 (available online: <https://www.ukhab.org>)

¹⁸ NatureScot, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust. (2021). Bats and onshore wind turbines: survey, assessment and mitigation. NatureScot, Inverness.

¹⁹ Chanin P. (2003) Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No.10 English Nature, Peterborough

²⁰ Dean, M. (2021) Water vole field signs and habitat assessment. A practical guide to water vole surveys. Pelagic Publishing, Exeter.

²¹ CIEEM. (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

²² Species and designated sites.

²³ [MAGIC \(defra.gov.uk\)](https://defra.gov.uk)

SEWBRcC data search will be updated prior to submission of the planning application²⁴.

Surveys completed to date

UKHab habitat survey

- 9.2.9 A UKHab survey of the Survey Area was completed in accordance with industry standard guidance (UKHab 2023), over four days in July and August 2024. The survey involved mapping all broad habitat types within the Survey Area. More botanical data was collected than is typical during a UKHab habitat survey, with plant communities assigned National Vegetation Classification (NVC) categories in the field, based on professional judgement and the experience of the surveyor. Potential groundwater dependent terrestrial ecosystems (GWDTEs) were identified based on the botanical characteristics of the communities present.
- 9.2.10 The survey was extended to assess the potential of habitats to support protected species and to inform the scope of future species survey.
- 9.2.11 Due to changes in the design of the Site since the initial UKHab survey was completed, the remainder of the developable area will be surveyed in 2025. Methods will be the same as 2024, with broad habitats identified and assigned NVC communities in the field. Potential GWDTEs will also be noted and the potential of habitats to support protected species assessed.

Bat survey

- 9.2.12 Bat activity was characterised using static acoustic bat detectors in accordance with industry standard guidance (NatureScot et al. 2021). This has involved the seasonal deployment of 12 static acoustic detectors at potential turbine locations (based on the working turbine layout at the time, of 15 turbines) for a minimum of 10 nights during spring, summer and autumn 2024. Song Meter 4 and Song Meter Mini full spectrum detectors were used. A weather station was deployed for the duration of the survey work, to collect site-specific meteorological data which was considered in combination with bat survey results to determine the conditions in which bats were most active.
- 9.2.13 The locations of bat detectors deployed during 2024 are illustrated in Figure 9.3 (Appendix C).
- 9.2.14 Bat roost surveys of trees and buildings within a 250 m perimeter area around proposed turbines will be completed in 2025. The aim of the survey will be to identify potential for roosting bats. Further climbed tree surveys and/ or emergence/ re-entry surveys will be completed if required.

Otter and water vole survey

- 9.2.15 Otter and water vole presence was determined during surveys which conformed to industry standard guidance (Chanin 2003, Dean et al. 2016).

²⁴ To update data to reflect changes to the Site boundary, and to extend the search area to 10 km for bats (and sites designated for their bat interest).

- 9.2.16 Streams, including their channels and banks, were systematically surveyed for signs of otter such as droppings (spraints), runs and footprints. Particular attention was given to suitable sprainting areas such as large, flat rocks and areas where otters are likely to enter and leave streams via runs and slides. Water vole surveys were completed concurrently and signs such as burrows, feeding remains, footprints and droppings were searched for in and around watercourses.

Proposed Surveys

UKHab survey

- 9.2.17 In accordance with the evolution of the design further UKHab survey has been proposed for 2025. As in 2024, the survey will identify broad habitat types, assign NVC communities to stands of vegetation in the field based on the professional judgement and experience of the surveyor, identify potential GWDTEs and be extended to assess suitability of habitat for protected species.

Otter and water vole

- 9.2.18 Further otter and water vole survey has been proposed for 2025. As in 2024, methods will follow industry standard guidance.

Bat survey

- 9.2.19 Further bat survey is proposed for 2025. As in 2024 the survey will use static acoustic bat detectors to characterize activity in accordance with industry standard guidance.

Great crested newt (GCN)

- 9.2.20 During habitat surveys in 2024, a pond potentially suitable for great crested newt was identified in the eastern part of the Site. An environmental DNA water test has been proposed to establish presence/ probable absence of the species.

Dormouse

- 9.2.21 Currently, impacts to potential hazel dormouse *Muscardinus avellanarius* habitat are not expected. Should emerging design details mean that impacts to woodland, scrub and hedgerow habitats cannot be avoided, targeted dormouse survey will be proposed. This survey would follow industry standard guidance (Bright et al., 2006)²⁵ and involve the placement of dormouse survey tubes in suitable habitat which would be checked for indications of use over a full dormouse season (April – November).

Badger

- 9.2.22 Currently impacts to badger *Meles meles* are not expected. Should emerging design details mean that badger may be impacted, a pre-construction survey will be recommended.

²⁵ Bright, P., Morris, P. & Mitchell-Jones, A. (2006). The dormouse conservation handbook 2nd Edition. English Nature, Peterborough.

Assessment of likely significant effects

- 9.2.23 The assessment will be completed in accordance with CIEEM guidance and will involve:
- 9.2.24 Determining important ecological features that require detailed impact assessment through evaluation of desk study and field survey data by:
- Defining the ecological zone of influence of the development; and
 - Considering the importance of ecological features within a defined geographical context (whether populations are important at the national, regional, county or local levels).
- 9.2.25 Characterising and quantifying effects and assessing their significance through:
- Consideration of whether effects are: beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased cumulatively as a result of other plans or projects; and
 - Determining the significance of both beneficial and adverse effects. This will be completed in relation to the conservation status of each species at the geographical level at which it has been valued.
- 9.2.26 Assessing the potential of the Site to affect the Favourable Conservation Status (FCS) of species, taking account of available data on their Current Conservation Status (CCS) at the national and local level. The value of any feature that will be significantly affected will then be used to draw conclusions on the implications of development in legislative terms and any additional measures needed to ensure policy compliance (CIEEM, 2019).

Cumulative effects

- 9.2.27 Consideration and assessment of cumulative effects with other developments, in particular wind farm sites, within the vicinity of the Site will be undertaken as part of the EIA.
- 9.2.28 The effects of the Site on most protected species and habitats are likely to be relatively localised, however, the assessment of impacts on bats will need to consider all wind farms (and other developments with the potential to impact on bats) within 10 km of the Site (in accordance with NatureScot (2021) guidance).

Transboundary and Inter-related Effects

- 9.2.29 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to biodiversity as a result of the project.

Consultation

- 9.2.30 Consultation will be sought with Natural Resources Wales (NRW) and the Swansea Council ecologist. It is proposed that discussions cover:
- A review of the adequacy of the desk study and field survey proposed/ completed.

- The main issues in terms of ecological impact assessment (under the EIA Regulations) and the parallel Habitats Regulations Assessment process.
- How effects can be most effectively mitigated through design and other measures.
- How the Site might deliver biodiversity net benefit in line with principles set out in Planning Policy Wales Chapter 6 (February 2024).

Likely significant effects

Construction

- 9.2.31 There is the potential for significant effects on the extent and condition of priority habitats within the Site through physical damage by wind farm construction, construction traffic and pollution. Construction phase pollution and sediment mobilisation could also potentially affect offsite watercourses, which eventually drain into the Carmarthen Bay and Estuaries SAC and the Burry Inlet SPA and Ramsar site. However, applied mitigation (including good practice prevention and control measures in relation to pollution prevention and soil compaction) will be embedded into the Site design and delivered through a Construction Environmental Management Plan (CEMP). Embedded and applied mitigation will aim to ensure that there are no significant effects on the hydrology or condition of designated sites in the wider landscape or priority habitats within the Site. These measures will be described in detail within the ES but considered prior to the assessment of the likely effects of the Site. If likely significant effects are identified then additional mitigation measures will be detailed prior to determining the likely significance of residual effects.
- 9.2.32 The potential for significant effects on protected species will depend on the outcome of ongoing survey work. There is potential for killing and injury and the loss of places of shelter for a range of species including otter, water vole, badger, bats, reptiles and amphibians.

Operation

- 9.2.33 The main potentially significant operational phase effect is bat fatality resulting from collision with turbine blades. The assessment will be undertaken with reference to NatureScot et al. (2021) guidance which categorises bat species in terms of their collision risk and relative abundance, to give an overall population vulnerability level for the species.
- 9.2.34 The assessment of operational effects on bats will be informed by the proposed collection of weather data and activity surveys using automated detectors and roost survey work in 2025. However, based on the data collected in 2024, it is likely that effects pipistrelle species will be the main focus of the assessment.
- 9.2.35 Effects on habitats and protected species other than bats during operation are likely to be neutral.

Decommissioning

- 9.2.36 The effects of decommissioning have the potential to be similar to those during the construction phase but are likely to occur over a shorter time period.
- 9.2.37 There is the potential for damage to habitats and killing and injury, disturbance and displacement of protected and priority species using the Site at the time of decommissioning.

- 9.2.38 It is reasonable to expect that there will be changes in legislation concerning habitats and protected species over the operational life of the Site. These may be driven by climatic change, government policy concerning land management, increased effectiveness/policing of species protection, ecological research, the spread of re-introduced and non-native species and other factors.
- 9.2.39 Predictions of potentially significant effects are therefore not possible, with any confidence, over the operational life of the Site. It follows that effects on protected and priority habitats and species would be best addressed through a decommissioning phase Environmental Management Plan. Effects during decommissioning are therefore scoped out of the assessment.

Matters to be Scoped out of the Assessment

- 9.2.40 The potential to scope out detailed consideration of effects on species such as otter, water vole, dormouse and great crested newt will depend on the scope and results of forthcoming survey work and the final development design.
- 9.2.41 Legislative compliance with regard to other protected and priority species, such as hedgehog should be possible to address through construction phase controls and are unlikely to require detailed consideration in the ecological impact assessment.

Approach to mitigation

- 9.2.42 The step-wise approach, which involves ensuring that any adverse environmental effects are firstly avoided, then minimised, mitigated and as a last resort compensated for, is being applied through the design evolution of the Site.

Embedded mitigation

- 9.2.43 Design phase measures ('embedded mitigation') will include:
- Avoidance of any development infrastructure in areas likely to affect the hydrology or condition of GWDTEs.
 - A stand-off (likely to be 50 m) from all watercourses to reduce the potential for effects on riverine mammals, fish and invertebrates associated with freshwater habitats.
 - Avoidance of known areas of high quality semi-natural habitat for turbine placement.
 - Feathering of turbines at idle.

Applied mitigation

- 9.2.44 Construction phase mitigation will principally be delivered through input to the CEMP. Ecological objectives of the CEMP will include:
- Appointment of an ecologist tasked with ensuring compliance with all relevant regulatory and other requirements, method statements and plans, and reporting to the principal contractor and statutory consultees concerning ecological issues;

- Identification of the scope and timing of pre-construction ecological survey work (to be informed by existing data and reconnaissance), and how this will potentially inform the approach to construction work;
- Ecological input to method statements for all components of the work. This should demonstrate how the potential for offences, pollution events and mobilisation of sediment will be avoided;
- The appointment of an appropriately qualified and experienced ecologist to act as an ecological clerk of works for the project; and
- The identification of appropriate ecological awareness training for site staff and contractors regarding the presence of protected and sensitive species and the importance of species-specific mitigation measures.

Additional mitigation

- 9.2.45 The requirement for additional mitigation, such as operational phase mitigation, will be informed by further statistical analysis of the correlation between weather conditions and bat use of the Site. If required, measures could include the adjustment of cut-in speeds to minimise potential for killing and injury and associated monitoring to determine the effectiveness of the measures implemented.

Enhancement

- 9.2.46 In conjunction with the ecological assessment, a policy-compliant biodiversity enhancement plan will be produced and will form part of the Habitat Management Plan (HMP) for the Site. The HMP will aim to deliver a net benefit for biodiversity drawing from the five key principles of achieving biodiversity resilience set out in the DECCA Framework (Planning Policy Wales (PPW) 12). The HMP will be implemented over the operational life of the Site and may include monitoring requirements.

10 ORNITHOLOGY

10.1 Introduction

- 10.1.1 This section of the scoping report sets out the proposed approach to the assessment of construction, operational and decommissioning effects of the proposed Upper Lliw Energy Project (the Site) on ornithological features.

Site description and context

- 10.1.2 The Site is characterised by unenclosed, exposed common land with upland acid grassland being the dominant habitat. Farmland enclosed by earth banks and hedgerows containing improved grassland and non-cereal crops²⁶ is present in the western part of the Site. Other habitats present include watercourses, upland heathland, lowland mixed deciduous woodland and upland flushes, fens and swamps.
- 10.1.3 No statutorily designated sites exist within 2 km of the Site which have birds as a feature of interest.
- 10.1.4 Burry Inlet Special Protection Area (SPA) and Ramsar Site lies 10.3 km south west of the Site. Burry Inlet is a large estuarine complex located between the Gower Peninsula and Llanelli in South Wales. It includes extensive areas of intertidal sand and mud flats, together with large sand dune systems at the mouth of the estuary. The site contains the largest continuous area of saltmarsh in Wales (2,200 ha). It is regularly used by 1% or more of the biogeographic population of regularly occurring migratory species: knot *Calidris canutus*, oystercatcher *Haematopus ostralegus*, pintail *Anas acuta*, and redshank *Tringa totanus*. It regularly supports at least 20,000 waterbirds, including: curlew *Numenius arquata*, dunlin *Calidris alpina alpina*, grey plover *Pluvialis squatarola*, shelduck *Tadorna tadorna*, shoveler *Anas clypeata*, teal *Anas crecca*, turnstone *Arenaria interpres*, and wigeon *Anas penelope*.
- 10.1.5 There are eleven Sites of Importance for Nature Conservation (SINC) within 2 km of the Site which do have birds as a feature of interest.
- 10.1.6 The Banc Darren Fawr SINC is in part designated for its bird species assemblage which includes raptors and passerines.
- 10.1.7 Other designated sites within the wider local area are referred to in the ecology scoping report.

Baseline survey information

- 10.1.8 The survey data summarised below relates to information collected during the breeding seasons (April to July/ August) of 2023 and 2024 and the winter (non-breeding) seasons (October to March) of 2022/ 23 and 2023/ 24.

Target raptors

- 10.1.9 Red kite, peregrine falcon, merlin and kestrel were noted during the survey work. The most

²⁶ Kale *Brassica oleracea*

commonly recorded raptor species was red kite. Records of peregrine, merlin and kestrel were less frequent.

- 10.1.10 Red kite activity was attributed to foraging and commuting flights. During the winter season of 2022/ 23, 84 flights were recorded over 3 hrs 22 mins. During the following years' winter season, 67 flights were recorded over 2 hrs 12 mins²⁷. During the breeding season of 2023, 55 flights were recorded over 2 hrs 36 mins. The following breeding season's surveys noted 51 flights over 2 hrs 37 mins. Although suitable habitat for breeding red kite was present within 2 km of the Site, no territories were identified during breeding raptor survey in 2023 or 2024.
- 10.1.11 Flights of peregrine falcon were mostly recorded over the Afon Lliw valley and crossing the Site between the Mynydd Garn-Fach and Banc Maestir Mawr plateaus. They were likely to be foraging and commuting flights. A peregrine territory was identified within the Site in 2023 but the nest site was not used in 2024.
- 10.1.12 Merlin were recorded on the Site infrequently. One flight was noted in the winter season of 2022/ 23 and three flights during the following winter. Merlin flights were not recorded during either breeding season and no evidence of breeding merlin was found during breeding raptor surveys. Habitat at the Site is unlikely to be suitable for breeding merlin, due to the proportions of heather moorland and grassland required within their core foraging range to support enough prey to sustain a brood (Parr 1991²⁸).
- 10.1.13 Small numbers of kestrel flights were recorded during the winter seasons of 2022/ 23 and 2023/ 24. Both foraging and commuting behaviour were recorded. During the breeding season of 2024, short flights were noted in April, June and July. Although suitable habitat exists within 1 km of the Site, no evidence of breeding kestrel was noted in either year.

Waders

- 10.1.14 Golden plover and snipe *Gallinago gallinago* were recorded during vantage point (VP) surveys.
- 10.1.15 Golden plover were regularly recorded during the winter season of 2022/ 23, with counts up to a maximum of 140 birds. They favoured elevated parts of the Site, with records concentrated over the Mynydd Garn-Fach and Tor Clawdd plateaus. Golden plover were not recorded during the breeding season of 2023. A similar situation was recorded during the winter of 2023/ 24, however numbers and flight frequency were reduced. In April of 2024, 70 birds were recorded on passage. No golden plover were recorded breeding in either year. Habitat is not suitable due to the lack of suitable heathland and the Site is outside the breeding range of the species in Wales.
- 10.1.16 Small numbers of snipe flights were recorded in the winter seasons of 2022/ 23 and 2023/ 24. A maximum count of 15 was recorded in October 2023. No snipe were recorded during breeding season VP surveys and no territories of snipe were identified during breeding wader surveys.

²⁷ Surveys were not conducted in September in 2023, however in 2022 only three flights were recorded in this month.

²⁸ Parr, S.J. (1991). Occupation of new conifer plantations by Merlins in Wales. *Bird Study* 38: 103–111.

Other birds

Passerines and near-passerines

- 10.1.17 The breeding bird community associated with the Site, was recorded incidentally²⁹ during VP and breeding raptor and wader surveys. The following red and amber listed birds (according to the Welsh Birds of Conservation Concern 4 (Johnstone et al 2024³⁰)) were recorded.
- 10.1.18 Red listed species present on the Site consisted of; cuckoo, meadow pipit *Anthus pratensis*, swift *Apus apus*, starling *Sternus vulgaris*, rook *Corvus frugilegus* and linnet.
- 10.1.19 Amber listed species present on the Site consisted of; green woodpecker, skylark, wheatear, mistle thrush and chaffinch.

Gulls

- 10.1.20 Herring gull, lesser black-backed gull (both red listed) and great black-backed gull (amber listed) were also recorded using the Site.
- 10.1.21 Great black-backed gulls were recorded at the Site from March to June. They were recorded seven times in total over two years of survey and all records were of one or two birds.
- 10.1.22 Lesser black-backed gulls were recorded at the Site from March to July. They were recorded 41 times in total and the highest single count was of 13 birds.
- 10.1.23 The majority of herring gull records were in April and May. They were recorded 190 times over two years of survey. The highest single count was of 122 birds.

10.2 Proposed Scope of Assessment

Legislation, policy and guidance

- 10.2.1 The approach to ornithological survey has been based on NatureScot (2025³¹) guidance for bird survey at onshore wind farms, which represents industry standard guidance for the UK.
- 10.2.2 Particular consideration has been given to those species listed under Annex 1 of the Birds Directive (2009/47/EC), Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), Section 7 of the Environment Wales Act (2016) and the Welsh red and amber lists

²⁹ Recorded as a chance encounter, outside the methods of the survey being undertaken

³⁰ Johnstone IG, Hughes J, Balmer DE, Brenchley A, Facey RJ, Lindley PJ, Noble DG and Taylor RC. (2022). Birds of Conservation Concern Wales 4: the population status of birds in Wales. *Milvus* 2:1.

³¹ NatureScot (2025). Recommended bird survey methods to inform impact assessment of onshore windfarms. Available online <https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>

(Johnstone et al. 2022³²) in deriving the detailed approach to the work.

- 10.2.3 Consideration has also been given to national and local policy, to include Planning Policy Wales (PPW) 12³³, Technical Advice Note (TAN) 5 Nature Conservation and Planning³⁴, Future Wales (The National Plan 2040)³⁵ and the Swansea Council Local Development Plan (LDP)³⁶ in informing the proposed assessment scope.
- 10.2.4 The approach to the ornithological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance (2019)³⁷, and informed by Collision Risk Modelling using the Band Model³⁸ derived by SNH.

Study area

- 10.2.5 The study area varied according to species group and survey method in accordance with industry standard guidance (SNH, 2017³⁹). Further commentary on the spatial extent of survey work is provided in the field survey section.

Desk study

- 10.2.6 The desk study was completed in May 2022. This included a review of aerial imagery and maps to broadly assess habitat types and connectivity, and a review of species and non-statutory site data from Aderyn, the Local Environmental Records Centre (LERC) Wales, Biodiversity and Reporting Database. This helped inform the approach to survey work. The Aderyn data search will be updated prior to submission of the planning application.

Proposed survey work

Surveys completed to date

- 10.2.7 Bird survey work started at the Site in September 2022. The following field surveys were completed in 2022, 2023 and 2024.

³² Johnstone, I.G., Hughes, J., Balmer, D.E., Brenchley, A., Facey, R.J., Lindley, P.J., Noble, D.G. & Taylor, R.C. (2022). Birds of Conservation Concern Wales 4: the population status of birds in Wales. *Milvus: the Journal of the Welsh Ornithological Society*. Available at: <https://tinyurl.com/BoCCW4>

³³ Planning Policy Wales, Edition 12. (2024). Welsh Government.

³⁴ Technical Advice Note (TAN) 5: Nature Conservation and Planning. (2009). Welsh Government.

³⁵ Future Wales: The National Plan 2040. (2021). Welsh Government.

³⁶ Swansea Council. Swansea Local Development Plan 2010 – 2025.

³⁷ CIEEM. (2019). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

³⁸ Band, W., Madders, M. & Whitfield, D.P. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. In: de Lucas, M., Jans, G.F.E. & Ferrer, M. (eds.) *Birds and Wind Farms: Risk Assessment and Mitigation*, pp. 259-257. Quercus, Madrid.

³⁹ Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness.

Vantage Point (VP) surveys

- 10.2.8 Vantage point (VP) surveys were undertaken from two locations overlooking the Site. Target species included all Annex 1 and Schedule 1 raptors, plus kestrel and waterbirds (excluding gulls). Figure 10.1(Appendix D) presents VP locations and viewsheds.
- 10.2.9 Breeding season VP work was completed in 2023 and 2024. Surveys aimed to collect 36 hours of data was collected from each VP between April and July in 2023 and April and August in 2024.
- 10.2.10 Year 1 non-breeding (winter) season work started in September 2022 and ended in March 2023. The second year's non-breeding season work started in October 2023 and ended in March 2024. Surveys aimed to collect 36 hours of data was collected from each VP in each year.

Breeding raptor surveys

- 10.2.11 Breeding raptor survey methods were based on industry standard guidance (Gilbert et al. 1998⁴⁰; Hardey et al. 2013⁴¹; SNH 2017⁴²) and were carried out between and including both April and July 2023 and 2024.
- 10.2.12 Surveys of potential breeding areas were completed using a combination of walkover survey and mobile VPs⁴³ where access was not possible. The durations of supplementary VP watches varied by location depending on the extent to which viewsheds covered the areas in question. During the surveys, habitat features⁴⁴ were searched for signs of raptors. Cliff faces were scanned using binoculars and a telescope. The surveys also involved walking along plantation edges and undertaking short VP watches of up to one hour duration over semi-natural and plantation woodland and quarries.

Waterbird counts of the Upper Lliw Reservoir

- 10.2.13 The Upper Lliw Reservoir was visited during the VP and raptor survey visits and any waterbirds present identified and counted. In 2022/ 23 twelve visits were made during the non-breeding (winter) season and six visits during the breeding season. In 2023/ 24 eleven visits were made during the non-breeding (winter) season and eighteen visits were made during the breeding season.

Assessment of likely significant effects

- 10.2.14 The assessment will be completed in accordance with CIEEM guidance and will involve:
- 10.2.15 Determining important ornithological features that require detailed impact assessment

⁴⁰ Gilbert, G., Gibbons, D.W & Evans, J. (1998). Bird monitoring methods. RSPB, Sandy.

⁴¹ Hardey, J., Crick, H., Riley, H., Etheridge, B., and Thompson, D. (2013). Raptors: a field guide to survey and monitoring. The Stationery Office; 3rd revised edition.

⁴² Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Inverness.

⁴³ Informal watches from VP locations other than those used for the formalised watches, which usually lasted for 2 hours or less.

⁴⁴ Habitat features included fence lines, rock outcrops, prominent mounds / tussocks and isolated trees.

through evaluation of desk study and field survey data by:

- defining the ornithological zone of influence of the Site.
- consideration of the importance of ornithological features within a defined geographical context (e.g. whether populations are important at the national, regional, county or local levels).

10.2.16 Characterising and quantifying effects and assessing their significance through:

- considering whether effects are: beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased due to cumulative effects with other plans or projects.
- determining the significance of both beneficial and adverse effects. This will be completed in relation to the conservation status of each species at the geographical level at which it has been valued.

10.2.17 The assessment process will be informed by Collision Risk Analysis⁴⁵. This will involve extrapolation of flight-data obtained during VP surveys, to calculate the number of flights likely to occur through the rotor swept area when the Site becomes operational. Following the application of avoidance rates, predicted fatalities per year and over the life of the wind farm (by each focal species) will be determined.

10.2.18 The value of any feature that will be significantly affected will then be used to draw conclusions as to what the implications of development are in legislative terms and whether it is likely to be policy compliant (CIEEM, 2019).

Cumulative effects

10.2.19 Consideration and assessment of cumulative effects with other developments, in particular wind farm sites, within the vicinity of the Site will be undertaken as part of the ornithological impact assessment (OIA).

Transboundary and Inter-related Effects

10.2.20 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to ornithology as a result of the Proposed Development.

Consultation

10.2.21 A Discretionary Planning Advice Service (DPAS) meeting with Natural Resources Wales (NRW) on the approach to ornithological work to inform the assessment is planned for early 2025.

10.2.22 The meeting will seek to agree the scope of the ornithological survey work and the focus

⁴⁵ NatureScot (2025). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. Available online: <https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms>

of the ornithological impact assessment.

10.2.23 Consultation will also be sought with Swansea Council ecologists. Discussions will cover:

- A review of the adequacy of the desk study and the proposed and completed field survey;
- The main issues concerning ornithological impact assessment;
- How effects can be most effectively mitigated through design and other measures; and
- How the Site might deliver biodiversity net benefit in line with Planning Policy Wales.

Likely significant effects

Construction

10.2.24 There is the potential for significant effects resulting from the displacement of breeding birds.

10.2.25 Breeding birds potentially affected by these works are:

- The Schedule 1 species peregrine falcon.

10.2.26 There is the potential for legislation which protects nesting birds from disturbance⁴⁶ to be contravened, and the potential for reduced productivity and, or loss of a pair from the local breeding population. This would be potentially significant at a local level.

Operation

10.2.27 The main potentially significant effect during operation will be:

10.2.28 Collision of breeding raptors and golden plover with turbines. This has the potential to affect species potentially breeding within the Site (peregrine falcon), those that breed within the wider landscape and use the airspace above the Site when commuting or foraging such as red kite, or species which use the Site for commuting and foraging during the non-breeding season, such as red kite and golden plover.

10.2.29 The survey data indicate that the most commonly recorded target raptor species was red kite, which were regularly recorded commuting and foraging over the Site.

Decommissioning

10.2.30 The effects of decommissioning have the potential to be similar to those during the construction phase but are likely to occur over a shorter time.

10.2.31 Species most likely to be disturbed and displaced from the Site during decommissioning

⁴⁶ The Wildlife and Countryside Act 1981

are those that breed, roost or forage within it at that time.

- 10.2.32 It is reasonable to expect that there will be changes in legislation concerning protected species, as well as changes in local populations and distribution over the operational life of the Site. These may be driven by climatic change, landscape-scale land management, increased effectiveness and policing of protection, changes in the attitude of land managers to birds, the spread of reintroduced populations, changes on the wintering and staging grounds of migrant species and other factors.
- 10.2.33 Predictions are not therefore possible, with any confidence, over the operational life of the Site. It follows that effects on birds would be best addressed through a decommissioning phase Environmental Management Plan. Effects during decommissioning are therefore scoped out of the assessment.

Matters to be Scoped out of the Assessment

- 10.2.34 Decommissioning stage effects are scoped out of this assessment due to the long operational life of the Site, and the likelihood that there will be changes to environmental legislation during this period.

Approach to mitigation

- 10.2.35 The step-wise approach, which involves ensuring that any adverse environmental effects are firstly avoided where possible, then minimised, mitigated and as a last resort compensated for, is being applied through the design evolution of the Site.

Applied mitigation

- 10.2.36 Construction phase mitigation will principally be delivered through input to a CEMP. This applied mitigation will be an integral part of the Site. Ornithological objectives of the CEMP will include:
- Appointment of an ecologist tasked with ensuring compliance with all relevant regulatory and other requirements, method statements and plans, and reporting to the principal contractor and statutory consultees concerning ornithological issues;
 - Identification of the scope and timing of pre-construction ornithological survey work (to be informed by existing data and reconnaissance), and how this will potentially inform the approach to construction work;
 - Ornithological input to method statements for all components of the work. This should set out to demonstrate how the potential for offences will be avoided;
 - The appointment of an appropriately qualified and experienced ecologist to act as an ornithological / ecological clerk of works for the project;
 - The identification of appropriate ornithological / ecological awareness training for site staff and contractors in respect of the presence of protected and sensitive bird species and the importance of species-specific mitigation measures.

Enhancement

- 10.2.37 In conjunction with the ecological assessment, a policy-compliant biodiversity enhancement plan will be produced and will form part of the Habitat Management Plan

(HMP) for the Site. The HMP will aim to deliver a net benefit for biodiversity in line with the DECCA Framework (Planning Policy Wales (PPW) 12). The HMP will be implemented over the operational life of the Site and may include monitoring requirements.

11 NOISE

11.1 Introduction

- 11.1.1 This section details the scope of work for determining any potential significant effects from noise or vibration during the construction, operation, and decommissioning phases of the Proposed Development.
- 11.1.2 The construction of the proposed development would introduce temporary noise sources in the form of plant and construction activities, along with the movement of vehicles. Noise would be generated during the construction of access tracks, excavation for turbine foundations and as a result of the haulage of materials within the site.
- 11.1.3 With respect to operational noise, wind turbines generate noise by two mechanisms; mechanical noise from the gearbox and generator in the nacelle; and aerodynamic noise caused by the noise of wind passing over the turbine blades. Wind turbines are designed to minimise mechanical noise, for example noise sources in the nacelle are contained within insulated enclosures. Aerodynamic noise is minimised by the design of the turbine blades; however, some aerodynamic noise is unavoidable. Aerodynamic noise increases in proportion with the speed of the turbine blade; therefore, noise levels generally increase with wind speed.

Guidance and Legislation

- 11.1.4 The following policy and legislation will be referenced within the assessment:
- Planning Policy Wales: Edition 12 (2024)
 - Welsh Assembly Government: Technical Advice Note (TAN) 11:Noise (1997); and
 - The Working Group on Noise from Wind Farms (1996), ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*.
- 11.1.5 Furthermore, the following good practice and guidance documents will be referred to throughout the assessment:
- British Standards Institute (2014), British Standard BS5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise;
 - Design Manual for Roads and Bridges (LA 111 Noise and vibration);
 - Institute of Acoustics (2013), A Good Practice Guide of the Application of ETSU-R-97 for the Assessment and Rating of Wind Farm Noise, and Supplementary Guidance Notes;
 - International Organisation for Standardisation (1996), ISO 9613-1, Acoustics – Attenuation of Sound during Propagation Outdoors: Part 1 – Method of Calculation for the Attenuation of Sound by Atmospheric Absorption; and
 - International Organisation for Standardisation (1996), ISO 9613-1, Acoustics – Attenuation of Sound during Propagation Outdoors: Part 2 – General Method of Calculation.

Baseline and Proposed Study Area

- 11.1.6 The site is located on open land to the north of Swansea. A number of potential Noise Sensitive Receptors (NSRs) have been identified, as detailed in Table 11.1. This list is not exhaustive and NSRs may be added to or removed from the list subject to further assessment work.

Table 11.1: Identified Noise Sensitive Receptors (NSRs)

NSR ID	Name	Approximate OS Grid Coordinates (NGR)	
NSR01	Blaen Nant Ddu Farm	264019	205351
NSR02	Coynant	264855	207010
NSR03	Tor Clawdd	267661	205305
NSR04	Lluast Lewis	267693	204228
NSR05	Biaen-r-Olchfa-Fach	266821	204661
NSR06	Maes-Tir-Bach Cottage	266262	204435
NSR07	Maes-Tir-Mawr	265609	204446
NSR08	Bwthyn y Bugail	265090	204750
NSR09	Ffynnon-Lefrith	264519	204603
NSR10	Ffynnon-Sant	263863	204401

- 11.1.7 An initial 'screening' exercise will be undertaken, which will be based on a proposed turbine layout and a candidate turbine model. For those NSRs where turbine noise levels are predicted to be above 35dB LA90 (at wind speeds up to 10m/s), a further and more detailed assessment (in accordance with ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms') will be undertaken including baseline noise monitoring, typically over a 3-4week period. Measurement locations and methodology would be agreed through consultation with Environmental Health.
- 11.1.8 No specific field surveys are proposed for the assessment of construction and decommissioning noise, however, baseline data captured for the operational noise assessment would be utilised within the construction assessment in accordance with BS5228.

11.2 Proposed Scope of Assessment

Construction Noise

- 11.2.1 The assessment of temporary construction noise effects will include the calculation of noise levels from the anticipated plant and activities at the identified noise-sensitive receptors. Predictions of construction noise levels will be undertaken in accordance with BS5228-1:2009+A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise using published source noise level data. The calculations will be undertaken in accordance with Annex F2.2, 'Method for Activity LAeq' and Annex F2.4, 'Method for Mobile Plant in a Defined Area', and will assume a worst case scenario of all plant operating continuously and simultaneously for 10 hours.

- 11.2.2 The predictions of construction noise levels will be assessed against appropriate threshold values to identify the significance of temporary construction noise effects. In the absence of specific national guidance on noise limits during construction activities, the guideline noise limits in BS5228 will be used.
- 11.2.3 The impact of traffic associated with the construction phase will be based on the results of the Transport Assessment, where consideration will be given to the increase in traffic flows generated on the proposed transport route(s). This will be based on the baseline and predicted flows and assessed following the guidance detailed within the Design Manual for Roads and Bridges (DMRB).
- 11.2.4 The assessment of residual effects of construction noise and construction traffic will be undertaken in accordance with relevant good practice, policy and guidance.

Operational Noise

- 11.2.5 The overall approach for the operational and cumulative noise assessment will be discussed in detail and agreed with the Environmental Health Officer at the Council. Ultimately, the assessment will be undertaken in accordance with ETSU-R-97, whilst also following the recommendations detailed within the Institute of Acoustics' (IOA) 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IOA GPG), as recommended by national planning guidance and specifically within Tan 8.
- 11.2.6 The assessment will be undertaken with reference to current best practice, noise predictions contained within the noise assessments of the individual applications and consented limits presented in the planning permissions. As per the guidance of ETSU-R-97 and the IOA GPG, daytime and night-time noise limits will be applicable to all wind turbines operating cumulatively.
- 11.2.7 In terms of operational turbine noise, noise impact will be considered throughout the design process in the form of changes to the proposed location of the turbines and/or the candidate turbine model. Mitigation, if required, will be based on the results of noise level predictions, assessed against the appropriate daytime and night-time cumulative noise limits.
- 11.2.8 The residual effects of operational noise will be undertaken in accordance with relevant good practice, policy and guidance.

Cumulative Effects

- 11.2.9 The cumulative noise assessment will consider other turbines within a distance of 5km from the proposed development, namely Mynydd y Gwair and Mynydd y Betws which are both currently operating. At this time there are no other known wind farms within 5km in the planning system.
- 11.2.10 The assessment of cumulative noise will be a key consideration with respect to the proposed development in the context of the consented noise limits associated with the operation of the existing wind farms.

Transboundary and Inter-related Effects

- 11.2.11 It is considered unlikely that there is potential for transboundary or inter-related effects on

receptors to occur in relation to Noise as a result of the Proposed Development.

Potential Significant Effects

- 11.2.12 The assessment of construction, operational, and decommissioning noise will compare predicted noise levels with the relevant noise limits. If the relevant noise limits are met, then the predicted effect will be determined to be not significant in EIA terms.
- 11.2.13 Where predicted noise levels are above the limit, and potential significant effects are predicted, mitigation measures would be designed and included within the proposed development to reduce the impacts to an acceptable level.

Matter to be Scoped Out of the Assessment

- 11.2.14 Vibration effects from construction and decommissioning activities, including road traffic, are considered to be negligible at the nearest sensitive receptors and are therefore proposed to be scoped out.
- 11.2.15 Effects during decommissioning - effects during decommissioning would be very similar in nature to those experienced during the construction phase and will be controlled by the Decommissioning Management Plan.
- 11.2.16 Similarly, operational vibration levels are considered to be negligible at the nearest sensitive receptors and are therefore proposed to be scoped out.
- 11.2.17 Low-frequency and infrasound is proposed to be scoped out with no evidence to support health impacts as a result of operational wind turbines.

12 SHADOW FLICKER

12.1 Introduction

- 12.1.1 Shadow Flicker is described as the effect caused when an operating turbine is located between the sun and a receptor, whereby the shadow of the rotating blades falls over a dwelling causing the binternal light intensity to fluctuate.
- 12.1.2 There is no guidance on shadow flicker in Welsh planning policy, however, the Update to Shadow Flicker Evidence Base (2011) published by the Department for Energy and Climate Change (DECC) states that assessing shadow flicker effects within 10 times the rotor diameter of a wind turbine has been widely accepted and shadow flicker is unlikely to occur at greater than 10.
- 12.1.3 This chapter sets out the proposed approach to the assessment of potential shadow flicker effects during construction and operation of the proposed development.

12.2 Proposed Scope of the Assessment

- 12.2.1 The assessment will identify areas where shadow flicker may be an issue, considering dwellings within 10 rotor diameters of the proposed wind turbines. Where appropriate this zone will be marginally extended to capture effects at dwellings close to the boundary. The assessment would be desk-based, using maps to identify dwellings, where required. Dwelling location and details will also be provided.
- 12.2.2 The technical analysis will be undertaken using specific software and assess the predicted effects at each relevant dwelling.
- 12.2.3 The ES chapter will include:
- Proposed wind development details;
 - Details of technical analysis;
 - Shadow flicker explanation;
 - Dwelling receptor details;
 - Assessment of dwellings;
 - Shadow Flicker Hours Chart (per receptor);
 - Assessment of hours per year/day;
 - Shadow flicker shutdown scheme including the specific time each turbine needs to be shut down to eliminate shadow flicker combined across all receptors.
- 12.2.4 A summary of findings and recommendations for next steps will conclude the chapter.
- 12.2.5 In the event that a potentially significant constraint is identified, further technical analysis and/or consultation may be recommended.

13 SOCIOECONOMICS

13.1 Introduction

- 13.1.1 This Chapter of the Scoping Report identifies the socio-economic receptors of relevance to the Project and considers the potential impacts arising from the construction, and operation and maintenance of the Project.

Data Sources

- 13.1.2 The following data sources as set out in **Table 13.1** have been used to define the baseline characteristics of the area.

Table 13.1: Data Sources

Indicator	Elements	Source
Population & Deprivation	Age structure, qualifications, deprivation, motor car availability and internet access	NRS, Census 2011 & 2021, Welsh Indices of Multiple Deprivation
Economy	Economic activity, GVA, business activity	ONS, Annual Population Survey, ONS UK Business Count, Census, IRENA Renewable Cost Database
Employment & Skills	Unemployment, Earnings, commuting patterns, occupation, industry, qualifications, Renewable Energy	ONS, Census 2011 & 2021, BRES, Department for Transport, Department for Business Energy & Industrial Strategy
Tourism & Recreation	Agricultural land value, public rights of way, parks and amenity, tourist economy, tourism employment	Welsh Government, Visit Wales Occupancy Survey, Great Britain Day Visits Survey, Great Britain Tourism Survey

Baseline Environment

- 13.1.3 This section defines the baseline environment characteristics of the study area based on our desktop research. Where appropriate the data is also analysed at regional and national levels for comparison.
- 13.1.4 The baseline data covers the following topic areas: population, demographics, employment, travel to work patterns, renewable energy, deprivation, and tourism & recreation.

Population and Demographics

- 13.1.5 **Commuting Patterns (2011 Census):** Swansea has a higher net migration of workers into the area (27,777) compared to those commuting out (20,101). Major inflows and outflows are from Neath Port Talbot and Carmarthenshire.
- 13.1.6 **Commuting Patterns (2023):** Fewer people are commuting into Swansea (16,600) and out of Swansea (19,200) compared to previous years, with a net change of -2,600 this may be due to COVID-19 working pattern changes.
- 13.1.7 **Population and Demographics:** Swansea's population is 246,742, representing 8% of the Welsh total. It has the highest working-age population proportion (63%) in the wider

employment study area.

- 13.1.8 **Population Growth:** Since 2018, Swansea's population increased by 3.2%, above the national growth rate of 2.6%. Carmarthenshire saw an 8.3% increase in residents aged over 65.

Employment and Business

- 13.1.9 **Employment:** Swansea has the second highest proportion of employees and the second lowest proportion of self-employed individuals among the three local authority study areas.
- 13.1.10 **Top Employment Sectors:** The top two employment sectors in Swansea are Health (19,000 jobs) and Public Administration & Defence (13,000 jobs), followed by Education (11,000 jobs).
- 13.1.11 **Construction Employment:** Construction is the 6th largest employer in the study area with 6,000 jobs, the highest in the Employment Study Area.
- 13.1.12 **Specialized Sectors:** Electric power generation, transmission, and distribution account for 300 jobs in Swansea and 550 in the wider area. Crop and animal production account for 250 jobs in Swansea and 2,050 in the wider area.
- 13.1.13 **Occupational Structure:** The study area has a diverse occupational structure with a lower percentage of skilled trades (7.3%) compared to Wales (9.7%). It has a higher share of professional occupations (22.5%) than Carmarthenshire (18.3%) and Neath Port Talbot (20%).
- 13.1.14 **Business Composition:** There are 17,580 businesses in the wider employment study area, with 89% being micro businesses, 9.3% small, 1.7% medium, and 0.3% large. Construction businesses account for 15.2% of all businesses in Swansea.
- 13.1.15 **Wages:** Neath Port Talbot has the highest resident wage (£37,130), exceeding the Welsh average (£34,303). Swansea's resident wage is £34,834, slightly higher than the Welsh level. Workplace earnings in Swansea are similar to resident earnings.
- 13.1.16 **GVA per Employee:** Swansea's GVA was £5.77bn in 2022, with a GVA per employee of £53,094. The construction GVA per employee in Swansea is £45,000.
- 13.1.17 **Travel to Work Patterns:** Most workers (56%) in the study area drive to work, with 25% working from home. The most common travel distances are 5km to <10km and 2km to 5km. Over 80% of households own at least one car or van.

Renewable Energy

- 13.1.18 **Electric Vehicle Registration:** As of Q2 2024, there were 9,848 licensed plug-in vehicles in Swansea, representing 6% of Wales' total electric vehicles and 3% of all licensed vehicles in Swansea.
- 13.1.19 **Electric Vehicle Growth:** The level of electric car ownership in Swansea is consistently increasing year on year, indicating a growing trend.
- 13.1.20 **Charging Points Demand:** The number of publicly available electric vehicle charging

points has increased since October 2019, but not at the same rate as electric vehicle ownership.

- 13.1.21 **Renewable Energy Production:** In 2023, Swansea produced 168,686 MWh of renewable energy, mainly from onshore wind (64%), which is 3% of Wales' total renewable energy production.
- 13.1.22 **Renewable Energy Capacity:** Swansea has 101.9MW of renewable energy capacity, with 34.7MW from onshore wind, representing 2.6% of Wales' onshore wind capacity.
- 13.1.23 **Energy Consumption:** The renewable energy produced in Swansea covers 51% of domestic consumption and 21% of total consumption, highlighting the need for increased renewable energy provision.

Deprivation

- 13.1.24 **Deprivation:** The Welsh Index of Multiple Deprivation (WIMD) is the Welsh Government's official measure of relative deprivation for small areas in Wales. WIMD identifies areas with the highest concentrations of several different types of deprivation.
- 13.1.25 The Welsh Index of Multiple Deprivation shows that some areas in east-central Swansea are in the top 10% most deprived areas in Wales, while the site location is in the 50% least deprived areas.

Tourism

- 13.1.26 **Economic Impact of Tourism:** According to the latest Swansea tourism data (2023), the total economic impact of tourism in Swansea was £609 million, a 5.1% increase compared to 2022. Tourism supports 5,470 full-time equivalent jobs, an increase of 5.4% compared to 2022.
- 13.1.27 **Visitor Numbers:** In 2023, Swansea had 4.67 million total visitors, an 11.5% increase compared to 2022. This includes 1.55 million staying visitors (1.9% increase) and 3.12 million day visitors (17% increase).
- 13.1.28 **Accommodation Landscape:** According to the Swansea STEAM Survey, 6 in 10 visitors opt for overnight stays with an average duration of 4.8 nights. Swansea has 517 accommodation establishments, with 78% being self-catering. There are a total of 29,916 bed spaces, with 73% located in caravan/camping sites.
- 13.1.29 **Attractions and Activities:** Activities such as walking, watersports, and cycling are crucial in attracting visitors. The primary reasons for visiting remain the coast, beaches, scenery, and landscape, which continue to captivate and draw in tourists. Swansea Bay is the predominant tourism location within Swansea; however, this is not located near the Proposed Development. The site location does not have many recreational or tourism activities near it.

Transboundary and Inter-related Effects

- 13.1.30 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to socioeconomics as a result of the Proposed Development.

13.2 Proposed Scope of Assessment

Assessment Methodology

- 13.2.1 The assessment of significance of effects is based on the magnitude of the predicted change to the baseline position, as well as the sensitivity of the Socio-economic receptors. Effects will be identified as either beneficial or adverse, whilst the sensitivity of the receptor and the magnitude of effect is classified as either high, medium, low, or negligible. The proposed assessment criteria are provided in the below tables.

Definitions of Sensitivity

Table 12.3: Definitions of Sensitivity

Sensitivity	Typical Descriptors
High	Receptor is identified as a policy priority. Evidence of major Socio-economic challenge or underperformance.
Medium	Receptor is important in policy. Evidence of under-performance or vulnerability.
Low	Receptor is not a policy priority. Evidence that the receptor is resilient and no particular challenges.
Negligible	Receptor is not a policy priority. Good overall performance in impact area.

Definitions of Magnitude

Table 12.4: Definitions of Magnitude

Magnitude of impact		Definition
High	Adverse	Severe detrimental impact to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of above 20%. Mitigation is likely to be hard to achieve or will require significant intervention.
	Beneficial	Major enhancement to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of above 20%. There are unlikely to be better alternative means of achieving this benefit or other methods would be more time consuming, more expensive, and/or less effective.
Medium	Adverse	Discernible detrimental impact upon key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of 11-20%.
	Beneficial	Discernible improvement to key social and/or economic characteristics. Where the impact is able to be quantified this would equate to a percentage change of 11-20%.
Low	Adverse	Minor detrimental alteration to, one or more key social and/or economic baseline characteristic(s). Where the impact is able to be quantified this would equate to a percentage change of 6-10%.

Magnitude of impact		Definition
	Beneficial	Minor benefit to one or more key social and/or economic baseline characteristic(s), or a reduced risk of negative impact occurring. Where the impact is able to be quantified this would equate to a percentage change of 6-10%.
Negligible	Adverse	Very minor detrimental alteration to one or more social and/or economic baseline characteristic(s). Mitigation is either easily achieved or little will be required. Where the impact is able to be quantified this would equate to a percentage change of under 5%.
	Beneficial	Very minor benefit to one or more social and/or economic baseline characteristics. Alternative means of achieving this benefit are likely to be easier, cheaper, more effective, and/or less time-consuming. Where the impact is able to be quantified this would equate to a percentage change of under 5%.
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.

- 13.2.2 The significance of the effect upon socioeconomics will be determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in the table below.

Table 12.5: Sensitivity of receptor

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

- 13.2.3 The definitions for significance of effect levels are described as follows:

- **Major:** These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a major change in a site or feature of local importance may also enter this category. Effects upon human receptors may also be attributed this level of significance.
- **Moderate:** These beneficial or adverse effects have the potential to be important and may influence the key decision-making process. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse or beneficial effect on a particular resource or receptor.
- **Minor:** These beneficial or adverse effects are generally, but not exclusively, raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project.

- **Negligible:** No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Embedded Measures and Mitigation

- 13.2.4 The following embedded measures are relevant to socioeconomics. The embedded measures will evolve over the development process as the EIA progresses.

Construction and Decommissioning Phase

- 13.2.5 A CEMP will be prepared to ensure that all of the potential impacts of construction are considered and mitigated where necessary. Prior to decommissioning, an appropriate management plan will be prepared which will control that phase of the proposed development.

Operation and Maintenance Phase

- 13.2.6 No necessary mitigation measures have been identified during the operational and maintenance phase of development at present. Should requirements for mitigation become apparent during the assessment of socio-economic impacts, they will be discussed in detail in the ES. This could include the production of a Public Right of Way Management Plan should there be any permanent impacts to the established routes.

Potentially Significant Effects

- 13.2.7 A range of potential impacts on socioeconomics have been identified which may occur during the construction, and operation and maintenance of the Project.
- 13.2.8 The impacts that have been scoped into the assessment are outlined in **Table 12.2** below together with justification, a description of any additional data collection and supporting analyses that will be required to enable a full assessment of the impacts

Table 12.2: Potentially Significant Effects

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
Employment	✓		The proposed scheme will create direct construction jobs and indirect jobs in wider economy / supply chain.	Desk-based review to develop a detailed baseline assessment of relevant socioeconomic conditions, including an assessment of employment and the businesses by sector.	An economic impact model will be developed to estimate direct, indirect, and induced employment impacts of the Project.
		x	Irregular / low intensity employment may be present; however, this is unlikely to be significant.	N/a	N/a
Education, Skills, and Qualifications	✓		Opportunities to skill up workforce during construction by providing training and skills as part of an employment and skills plan.	Desktop review of occupational structure and qualifications of the study area population.	Consultation with key members of the local community to identify appetite for upskilling in the community will be undertaken to inform an Employment and Skills Plan.

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
		✓	Opportunities for education visits from schools to visit the turbines to learn about renewable energy technologies. Potential to provide educational boards at the site. Potential for biodiversity trails to encourage knowledge around nature enhancement	Desktop review of qualifications of the study area population. Review of local schools.	Consultation with key stakeholders to discuss how visits could be organised and what areas and age groups to target.
Economic Output	✓		Positive effect(s): During construction, greater construction worker spending in local economy and the direct investment in the local supply chain. Negative Effect(s): Potential disruption to businesses through closures to transport network. Impact upon agricultural output during construction onsite. Impact on tourism.	Desktop-based review of employment demographics, potential sources of an increase in spend. Consultation with landowners to discuss potential impacts. Review of local tourist areas.	Estimates of the GVA as a result of additional/lost expenditure at each stage of the project will be calculated

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
		x	Economic output associated with employment generated is likely to be minimal.	N/a	N/a
Tourism	✓		During construction there is the potential for construction works to cause disturbance and reduce access to tourist attractions in the study area. Noise, Landscape and visual impacts could also deter tourists from visiting during construction.	Desktop-based review of local tourism statistics and attractions in the study area. Review of conclusion of other technical chapters.	Identify potential factors that could deter tourists from visiting attractions during the construction phase of development (visual, noise). Identify all tourist receptors that could be impacted.
		x	It is unlikely that there will be any significant impacts on tourism once the wind farm is operational.	N/a	N/a
Recreation	✓		There are a number of PRoW which might be affected directly and indirectly as a result of the construction works.	Review of PRoW network, Potential need for user surveys to capture data on frequency of use of routes.	Assess impact of any temporary or permanent diversions. Review conclusions of other chapters.

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
		✓	There are unlikely to be any direct impacts on recreation at operational stage, however, a recent Business, Energy & Industrial Strategy Public Attitudes Tracker carried out in Spring 2024 found that the main reasons for people being unhappy about windfarms being constructed in their local area were concerns about appearance or impact on views (64%). The socio-economic assessment will, therefore, consider the conclusions of the landscape and visual chapter when assessing indirect recreational impacts at operational stage.	Potential need for user surveys to assess frequency of use of routes and potential impact of scheme on users.	Assess impact of any permanent diversions. Review conclusions of other chapters and analyse user survey results.

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
Commuting	✓		Impacts on the road traffic network during construction could impact upon commuting patterns of residents within the study area.	Desktop-based review of commuting patterns in and out of the study area.	A Construction and Environmental Management Plan (CEMP) will provide detail on the required use of the road network for provision of labour, construction materials, etc, and therefore determine the likely additional stress on the road network.
		x	It is unlikely that there will be any significant impacts on tourism once the wind farm is operational.	N/a	N/a
Housing (Temporary Workers Accommodation)	✓		The construction stage could result in increased demand for temporary workers accommodation comprising temporary bed or short-term rentals for construction workers and specialist contractors. The capability to provide housing for a non-resident workforce will be further considered.	Desktop-based review of accommodation providers and accommodation occupancy rates. Desktop review of the current housing market, including tenure, house types and house prices.	Assessment of vacancy rates of accommodation providers throughout the year and the number of those to be employed for works.

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
Housing (House Prices)		X	47% of people living in rural areas were likely to oppose wind farms due to concerns about house prices (47%). In our experience, the development of a wind farm is very unlikely to negatively impact house prices, therefore we have scoped this out.	N/a	N/a
Crime & Safety	X	X	There is the potential for increased crime in relation to theft from the construction sites. Security arrangements for the Proposed Scheme will be in line with the requirements set out in the Construction (Design and Management) Regulations and appropriate levels of security	N/a	N/a

Potential Effect and Receptor	Project Phase*		Justification	Data collection and analysis required to characterise the baseline environment	Summary of the proposed approach to assessment
	C&D	O			
			(personnel / CCTV) will be appointed. Therefore, there is unlikely to be a significant effect in relation to crime and safety.		

* construction (C) and decommissioning (D), and operation and maintenance (O)

13.3 Beneficial Recommendations

- 13.3.1 In addition to mitigation of potential negative impacts, beneficial recommendations can be adopted in order to emphasise potential positive outcomes. As with the mitigation measures, there is the opportunity to develop beneficial recommendations throughout the EIA process, as likely impacts and effects are better understood.

Construction and Decommissioning Phase

- 13.3.2 A skills and employment plan should be developed to target skills and employment opportunities for the study area population in the first instance.

Operation and Maintenance Phase

- 13.3.3 The skills and employment plan if carried out effectively may have long term beneficial impacts associated with the operation and maintenance phases.

14 HISTORIC ENVIRONMENT

14.1 Introduction

- 14.1.1 This section has been written by Heneb – The Trust for Welsh Archaeology and describes the approach to be taken towards understanding the potential effects of the proposed renewable energy development on the historic environment. It outlines the legislative and policy framework and principal guidance for the historic environment within Wales and details the methodology that would be applied to identify historic assets, assess their significance and how setting contributes to that significance, and how the Proposed Development might impact upon the assets. This section also considers the possible mitigation measures that may be required.
- 14.1.2 Heneb Clwyd-Powys Archaeology (Heneb CPA) were commissioned by their client Cenin (via Tetra Tech who coordinated the scoping report) to undertake a historic environment scoping assessment of the proposed Upper Lliw Energy Project, Salem, Swansea. This scoping report has referenced the RPS Group 2024 Felindre Wind Farm Swansea Cultural Heritage Desk Based Assessment (DBA), which is included as Appendix E. The 2024 DBA assessed a previous iteration of the turbine array and gathered heritage data within the Site boundary and a buffer area which extended up to 5km from that boundary.

Site Context

- 14.1.3 The Site is located in the Ponterddulais and Pontardawe area, between the Upper and Lower Lliw reservoirs, Mawr Community Council in Swansea Council, set in a rural upland landscape which consists mainly of rough sheep grazing land and peat moorland. It is directly south (approximately 1km) of an existing windfarm at Mynydd y Gwair. The proposed renewable energy scheme would be one of many proposed wind farms within the south Wales area. The extent of the turbines covers approximately 3km by 2km of the upland area. By contrast, the existing windfarm to the north occupies approximately 2km by 1km.

Previous Study

- 14.1.4 The 2024 Felindre Wind Farm, Swansea, Cultural Heritage Desk-Based Assessment (DBA) focused on the location of the turbines and a 5km buffer zone extending from the Site boundary. The DBA was completed on an old layout and will be updated accordingly prior to submission of any application. The area assessed “a parcel of land at Felindre, West Glamorgan, South Wales upon which it is proposed to construct multiple wind turbines and associated infrastructure” (Appendix E, p1). The DBA was separated into two areas, a 1km buffer zone for non-designated assets, and a larger 5km buffer zone for designated assets. This study overlaps very largely with the area of the current wind farm design and its related scoping report study.
- 14.1.5 The DBA involved a Site walkover, which found that the majority of the designated heritage assets were unlikely to be impacted by potential development due to the landform and vegetation which obscured the heritage assets from intervisibility with the turbines.
- 14.1.6 It was suggested that 17 designated heritage assets might be affected by the proposed development due to some degree of intervisibility which would result in an alteration within the setting of each asset (pp 27). The effects to the assets are described as temporary and

“alterations to the setting of these assets is likely to result in adverse impacts to the significance of such assets, within the spectrum of less than substantial harm” (Appendix E, p 27).

Heneb search area

- 14.1.7 Heneb CPA have expanded slightly on this by extending the search area for 2km from the turbine locations for non-designated assets to help assess the potential for predicting unknown buried remains within the Site, and a 5km search area from the turbine locations for designated assets.
- 14.1.8 The 5km search area focusing on the designated assets (Map 1) was found to contain two Grade II* Listed Buildings (LB), 31 Grade II LBs (Table 3), and 19 Scheduled Monuments (SM) (Table1), and no other designated assets. Only four of the SMs and four LBs, however, are located within 2km of the turbines. Within this 2km search area 238 non-designated assets have been identified also (Maps 2 and 3; Tables 2 and 4).

Legislation Policy and Guidance

- 14.1.9 The following legislation, planning policies and national guidance are relevant to the proposed development and the Environmental Impact Assessment (fuller details are included in Appendix E, sections 2.1 – 2.49):
- Ancient Monument and Archaeological Areas Act 1979
 - Planning (Listed Buildings and Conservation Areas) Act 1990
 - Well-being of Future Generations (Wales) Act of 2015
 - Historic Environment (Wales) Act 2023
 - Planning Policy Wales (12th edition, 2024) Chapter 6
 - Future Wales: The National Plan 2040 (Policies 17 and 18 for renewable energy)
 - Swansea Local Development Plan 2010 – 2025
 - PPW Technical Advice Note 24: The Historic Environment
 - Cadw 2011 Conservation Principles for the sustainable management of the historic environment in Wales
 - Cadw 2017 Setting of Historic Assets in Wales
 - Cadw 2017 Heritage Impact Assessment in Wales

Baseline Conditions

- 14.1.10 The baseline conditions have been established by the previous 2024 DBA. The Site is a rural upland Site with occasional prehistoric to more prolific post-medieval activity. The prehistoric activity (Appendix E, sections 4.10 – 4.16) is largely a Bronze Age funerary and ritual landscape that includes several SMs, but there is very little later prehistoric or Roman evidence (Appendix E, section 4.17). The early medieval (Appendix E, sections 4.18 – 4.22) includes several earthworks (dykes, house platforms and hog-backed mounds), whilst the HER data indicated that there were a high number of records for post-medieval and modern industrial development of the surrounding area, but with limited direct relevance to previous

activity within the application Site itself (Appendix E, section 4.6).

- 14.1.11 The DBA found that there were 3 Grade II* LBs, 42 Grade II LBs, and 19 SMs within their search area, and suggested that the majority of the designated heritage assets would not be impacted by potential development due to the landform and vegetation which obscured the heritage assets from view.
- 14.1.12 In terms of the potential for prehistoric archaeology, the DBA highlighted that 'based on the available evidence, there is considered to be a moderate potential for Bronze Age funerary activity within the Proposed Development of local to regional significance' (Appendix E, summary).
- 14.1.13 For Early Medieval to Medieval archaeology, the DBA assessed that 'there is also a localised high potential for Early Medieval and Medieval earthworks in the northeast part of the Proposed Development, with the potential for this period decreasing to low elsewhere within the Proposed Development' (Appendix E, summary).
- 14.1.14 Heneb's assessment has found there are no designated historic assets within the Site boundary, and less than 20 non-designated assets. Within the surrounding 5km and 2km search areas there were 19 SMs (Table 1), 33 LBs (2 Grade II* and 31 Grade II) (Table 3) (Map 1), 167 HER assets (Map 2 and Table 2), 71 NMR assets (Map 3 and Table 4), and 17 events.

14.2 Proposed Scope of Assessment

- 14.2.1 The purpose of the assessment is to identify the potential effects of the Proposed Development on the historic environment and cultural significance of the area in which the development is located.

General approach

- 14.2.2 Policy and guidance suggest that EIA should be proportionate, concise and focused on potential significant effects. Cadw's Conservation Principles for the sustainable management of the historic environment in Wales (page 18) states in the section on Managing Change to an Historic Asset: 'Changes to historic assets are inevitable. To ensure the long-term future of historic assets, change needs to be managed to ensure that their significance is not diminished as a consequence', and paragraph 47 'When considering the severity of potential impacts upon an historic asset, there should always be proportionality and reasonableness'. The heritage assessment will use these key aims of the guidance to ensure the results of the study are focused on a proportionate response to potential impacts on heritage significance.
- 14.2.3 Following best practice guidance published by the Welsh Government and Cadw for conserving the historic environment and managing change within it, this EIA would include a description of the principal elements of heritage significance using purchased data, and web-based sources. Once the baseline has been established, the heritage significance of the designated assets would be determined, including through a targeted Site survey, with particular focus on those with important visual connections such as hillforts and upland burial monuments. This would be followed by analysis of the settings for designated assets based on their geographic and topographic location, period, function, character, intervisibility with other assets and related matters, to establish what within the setting contributes to heritage significance.

Visual modelling and filtering of assets

- 14.2.4 To assess the degree of potential change to the landscape and the potential impact on the setting of assets, a Zone of Theoretical Visibility (ZTV) (based on a bare earth model) would be used to filter out assets which would not experience intervisibility with the turbines, supplemented by a field visit for those designated assets that have the potential to be affected. Principally, a ZTV generated for both hub height and to blade tip would be used for the turbines.

Detailed staged approach

- 14.2.5 Detailed guidance has also been issued by Cadw on the Setting of Historic Assets in Wales (May 2017) and Heritage Impact Assessment in Wales (May 2017). These promote a staged approach to assessing assessment of historic assets, their historic significance and the potential impacts from development, and would be applied as part of the cultural heritage assessment. The assessment would also address issues such as permanence or reversibility, construction, operation and decommissioning, as well as temporary or long-term effects. The guidance helps to identify key aspects of a wind farm and other renewable energy infrastructure that might affect the historic environment, such as visual dominance, scale, intervisibility, vista and sight-lines, movement, sound or light effects, and unaltered setting.
- 14.2.6 The Cadw guidance is sufficiently detailed for a clear distinction to be made between the aims of the assessment, (which is to establish heritage significance), how setting contributes to that heritage significance, and how this might be altered by a development, as opposed to merely stating that all development would result in change to the surroundings of a heritage asset.
- 14.2.7 In summary, this approach is required because the simple fact that a new development might be visible from a heritage asset is not in itself an adverse impact. The guidance is designed to manage change and allow for sustainable development which does not substantially harm the historic environment, and the staged assessment process allows a balanced view to be established as to what is of importance for understanding a historic asset in its setting.

Study area

- 14.2.8 The study area for indirect impact of operational turbines on scheduled monuments and designed landscapes would be 5km from the turbines, and for other designated historic assets (listed buildings and conservation areas) this would be 2km from the turbines. This allows a proportionate assessment of potential significant effects, with most listed buildings having a relatively close and discrete setting which contributes to their heritage significance (their special architectural and historic interest) compared to scheduled monuments that are more likely to have been located to take advantage of longer-distance views.
- 14.2.9 The study area for non-designated historic assets would be within the Site boundary, and these would be assessed for direct (physical) impacts. Early constraint mapping and advice input as part of design evolution would be employed to avoid or minimise any physical harm to historic assets. Attendance at design workshops will ensure the historic environment is included in the balance of maximising the benefits of renewable energy production against the potential harm to historic assets.

Significance and impact assessment criteria

- 14.2.10 The heritage impact assessment will follow national policy and best practice guidance in order to establish a robust and transparent analysis of the issues. The approach adopted will follow a standard staged process consisting of baseline survey to identify known and potential historic assets, design iteration to avoid these heritage constraints and minimise potential impacts on the historic environment, comparative analysis to determine which historic assets might be affected by the Proposed Development, field survey and analysis to establish the heritage significance of important affected assets, characterising the nature and magnitude of impacts, design of mitigation measures, and an assessment of the residual effect on the historic environment. This process will be tabulated according to sensitivity (Table 10.1), and magnitude of impact (Table 10.2), and then the significance of effect can be derived from a matrix where these two tables are compared (Table 10.3).

Table 14.1: Heritage value/sensitivity

Heritage Significance	Explanation
Highest	World heritage sites
	Scheduled monuments
	Grade I and II* listed buildings
	Grade I and II* registered parks and gardens
	Designated battlefields
	Protected wrecks
	Non-designated assets of equivalent significance
High	Grade II listed buildings
	Grade II registered parks and gardens
	Conservation areas
	Non-designated assets of equivalent significance
Medium	Archaeological sites of local importance
Low	Sites are of minor importance or with little remaining to justify a higher category

Heritage Significance	Explanation
Negligible	Negligible or no heritage significance
Unknown	Further information is required to assess the potential of these sites

Table 14.2: Magnitude of impact

Magnitude of Impact	Definition
High beneficial	The development would considerably enhance the heritage significance of the affected asset or the ability to appreciate it
Medium beneficial	The development would enhance to a clearly discernible extent the heritage significance of the affected asset or the ability to appreciate it
Low beneficial	The development would enhance to a minor extent the heritage significance of the affected asset or the ability to appreciate it
Very low beneficial	The development would enhance to a very minor extent the heritage significance of the affected asset or the ability to appreciate it
Neutral / None	The development would not affect, or would have harmful and enhancing effects of equal magnitude, on the heritage significance of the affected asset or the ability to appreciate it
Very low adverse	The development would erode to a very minor extent the heritage significance of the affected asset or the ability to appreciate it
Low adverse	The development would erode to a minor extent the heritage significance of the affected asset or the ability to appreciate it
Medium adverse	The development would erode to a clearly discernible extent the heritage significance of the affected asset or the ability to appreciate it
High adverse	The development would severely erode the heritage significance of the affected asset or the ability to appreciate it

Table 14.3: Significance of effect

Magnitude of Impact	Heritage Significance					
	Highest	High	Medium	Low	Negligible	
High beneficial	Substantial	Substantial	Slight	Very Slight	Negligible	
Medium beneficial	Substantial	Moderate	Slight	Very Slight	Negligible	
Low beneficial	Moderate	Slight	Very Slight	Very Slight	Negligible	
Very low beneficial	Slight	Very Slight	Negligible	Negligible	Negligible	
Neutral / nil	Neutral / nil	Neutral / nil	Neutral / nil	Neutral / nil	Negligible	Neutral / nil
Very low adverse	Slight	Very Slight	Negligible	Negligible	Negligible	
Low adverse	Moderate	Slight	Very Slight	Very Slight	Negligible	
Medium adverse	Substantial	Moderate	Slight	Very Slight	Negligible	
High adverse	Substantial	Substantial	Slight	Very Slight	Negligible	

Enhancement

Harm

Cumulative Assessment

- 14.2.11 Assessment would be made of the potential for cumulative impact on designated historic assets from the Proposed Development and other schemes in planning, as well as those consented or operational, within a 5km range of SMs potentially affected by the development, and 2km from potentially affected LBs. Visual modelling (wirelines) and ZTVs would be used in helping to appreciate and/or assess what the likelihood of such cumulative impacts might be.

Transboundary and Inter-related Effects

- 14.2.12 It is considered unlikely that there is potential for transboundary or inter-related effects on receptors to occur in relation to historic environment as a result of the Proposed Development.

Consultation

- 14.2.13 Cadw, Swansea Council (SC), and Heneb responses to the Scoping Report will be examined and discussed as necessary to agree the approach to assessment of direct and indirect impacts. In addition to the historic assets identified as part of this Scoping Report, there may be one or two additional specific designated assets which Cadw would wish to be included because of their design for far reaching views. Consultation would also identify potential wireline and photomontage visualisations to assist with achieving a better understanding of the magnitude of potential impacts on historic assets. Discussion would also be undertaken with SC's conservation officer for Grade II listed buildings, and with SC's archaeological advisors, Heneb, in respect of the potential direct impacts on archaeological features, and potential mitigation if any impacts might occur.

Approach to Mitigation

- 14.2.14 Mitigation will be undertaken as part of design evolution to avoid direct impacts, and to minimise indirect impacts. Direct impact to assets would be from ground disturbance, such as borrow pits, compounds, substation, the creation of construction roads within the development area and bases of the turbines. Indirect impact would be through development within the setting of a designated historic asset which might affect the heritage significance of the asset.
- 14.2.15 There are few measures for effective mitigation of visual impact from the proposed turbines, and so the design iteration phase of the project is crucial to ensure safeguarding of the historic environment. Through this approach it is anticipated that direct impacts on known archaeological assets can be avoided, but for anywhere this is not possible (such as an access track crossing an earthwork bank or a crane hardstanding in proximity to a house platform) specific measures would be designed to identify the feature and protect it from accidental damage, or ensure archaeological monitoring and recording is implemented.
- 14.2.16 A previous walkover survey was conducted to determine the risk of physical impact. The survey found that known assets were generally very visible, such as the prehistoric earthwork features which were clearly defined. The walkover survey also noted that there were no new assets identified but that some areas of thick vegetation may have hidden potential unknown assets. Targeted survey of turbine bases and other infrastructure groundwork locations would be conducted to ensure previously undetected remains at risk from construction would be identified, investigated, and/or protected at an early stage.

Likely Significant Effects

- 14.2.17 The design evolution process should ensure significant historic assets remain unharmed, both from direct (physical) impacts to non-designated assets within the Proposed Development boundary, or by indirect (mainly visual) impacts from the turbines, and possibly from other elements of the development.
- 14.2.18 The potential impacts will be divided into construction, operational and decommissioning

phases, and the degree of impact will include the duration that the impact would endure. It is possible that the prehistoric burial monuments might receive some change due to development within their setting. It is unlikely that listed buildings would be unduly affected due to the focus of their heritage significance being within related to their socio-economic function, and their distance from the turbines.

- 14.2.19 There is one designated asset with potential impact, the Ring Cairn on Tor Clawdd (GM353), which although outside the Site, is adjacent to the application boundary and in relatively close proximity to two turbines. The asset is a scheduled monument comprising of a Bronze Age circular ring cairn measuring 52m in diameter and larger enclosure of earth and stone measuring 1.5m and 0.3m in height. It is situated 250m above OD on open moorland. Against the south enclosure is a round structure approximately 12.8m in diameter with a bank 1.8m in width and 0.3m in height with an external ditch. The feature is somewhat overgrown by the surrounding scrub and grass, but still clearly visible. The asset is 343m north of the nearest turbine, and therefore at risk of indirect impact only. Three other scheduled monuments (a cairn, a barrow and a medieval earthwork castle) lie with 2km of the turbines and because of their proximity might also be more significantly affected by development within their setting than the remaining 15 SMs within the 5km study area.
- 14.2.20 There are only four LBs within the 2km study area. These are two cottages in the south, a bridge to the east, and a valve tower on the southern shore of Upper Lliw Reservoir. It is unlikely the heritage significance of these assets would be significantly affected. The two Grade II* LBs identified in the scoping search area lie outside the proposed study area, but because of they are assets of the highest value similar in level with SMS, they would be assessed to establish if significant impacts would occur.
- 14.2.21 The non-designated assets include multiple prehistoric assets such as two chambers on Graig Fawr (GM513), the Bancbryn Cairn Cemetery (CM333), and the Carn Llechart stone circle (GM078). Other later assets include the Clydach Upper Forge (GM497) and Bancbryn post-medieval lliest farmstead (CM332), but none of these assets lie within the current design for turbine locations.

Table 1: List of designated assets within the 5km buffer boundary

Record number	SAM number	Name	Type	Period
1082	CM334	Bancbryn platform cairn	Platform Cairn	Prehistoric
1083	CM335	Bancbryn cairn cemetery [east]	Round Cairn	Prehistoric
1276	GM612	Mynydd y Garth Cairn	Round Cairn	Prehistoric
1457	GM497	Clydach Upper Forge	Iron forge	Post Medieval/Modern
1527	GM513	Two Burial Chambers on Graig Fawr	Chambered Tomb	Prehistoric
2800	CM178	Round Cairns 430m North West of Henrhyd	Round Cairn	Prehistoric
3561	GM078	Carn Llechart Stone Circle	Round Cairn	Prehistoric
3567	GM353	Ring Cairn on Tor Clawdd	Ring Cairn	Prehistoric
3570	GM380	Ring Cairn on Craig Fawr	Earthwork (unclassified)	Prehistoric
3573	GM255	Penlle'r Castell	Castle	Medieval
3574	GM201	Pant-y-Ffa Round Cairn	Round Cairn	Prehistoric
3575	GM202	Mynydd Pysgodlyn Round Barrow	Round Barrow	Prehistoric
3577	GM386	Earthwork on Graig Fawr	Hillfort	Prehistoric
3578	GM299	Llangyfelach Cross-Base	Cross	Early Medieval
3581	GM308	Earthwork 1080m NNW of Fforest Newydd	Enclosure	Prehistoric
3584	GM480	Burial Chamber Nr Carn Llechart	Chambered Tomb	Prehistoric
3585	GM384	Cairn 250m SW of Banc Llyn-Mawr	Round Cairn	Prehistoric
3586	GM439	Cae Castell (Rhyndwyclydach Medieval Earthwork)	Earthwork (unclassified)	Medieval
4102	CM332	Bancbryn post-medieval llost farmstead	Farmstead	Post Medieval/Modern
4110	CM333	Bancbryn cairn cemetery	Round Cairn	Prehistoric
4449	GM638	Tir-Gwylt Second World War Barrage Balloon Site	Barrage Balloon Mooring	Modern
1082	CM334	Bancbryn platform cairn	Platform Cairn	Prehistoric

Table 2: List of non-designated assets within 2km buffer zone

Record number	Name	Type	Period
GGAT00338w	Graig Fawr Ring Cairn 6	Ring cairn	Bronze Age
GGAT00340w	Graig Fawr Cairn Group	Cairnfield	Bronze Age
GGAT00341w	Banc Llwyn Mawr Cairn Group	Cairnfield	Bronze Age
GGAT00344w	Graig Fawr burnt mound	Burnt mound	Bronze Age
GGAT00346w	Twyn Tyle North Cairn Group	Round barrow cemetery	Bronze Age
GGAT00348w	Mynydd Garn Fach	Cairn	Bronze Age
GGAT00349w	Tor Clawdd Ringwork, Rhyd-y-gwin	EARTHWORK	Bronze Age
GGAT00359w	Mynydd Y Gwair Cairn	Cairn	Bronze Age
GGAT00363.0w	Causeway, Tor Clawdd	Road	Medieval
GGAT00365w	Mynydd Pysgodlyn Cairn	Cairn	Bronze Age
GGAT00366w	Penlle'r bebyll Ring Cairn	Ring cairn	Bronze Age
GGAT00375w	Craig-y-Bedw 4 Platform, Mawr	Platform	Medieval
GGAT00376w	Ffynnon Sant	Holy well	Medieval
GGAT00974w	Gerddin Fawr	House	POST MEDIEVAL
GGAT00975w	Cae Newydd	House	POST MEDIEVAL
GGAT00976w	Cynghordy Mawr	House,FARMSTEAD	POST MEDIEVAL
GGAT01002w	Lletty Thomas, Llangyfelach	House,FARMSTEAD	POST MEDIEVAL
GGAT01004w	Llewyn Meurig	House,FARMSTEAD	POST MEDIEVAL
GGAT01006w	Rhos Fawr, Mawr	House,FARMSTEAD	POST MEDIEVAL
GGAT01026.0w	Tor Clawdd Routeways	Trackway	Medieval
GGAT01034.0w	Hollow Way, Llwyn Domen Farm	Hollow way	POST MEDIEVAL
GGAT01040.0w	Possible Roman Road on Mynydd y Gwair	Road	Roman
GGAT01075w	Graig Fawr Inner	Ring cairn	Bronze Age
GGAT01164w	Clearance Cairn, Mawr	Clearance cairn	POST MEDIEVAL
GGAT01174w	Craig-y-bedw 5 (PH12) Platform, Swansea	Platform	Medieval
GGAT01175w	Craig-y-bedw 6 (PH12) Platform, Swansea	Platform	Medieval

Record number	Name	Type	Period
GGAT01178w	Cae Castell Castle, Llechart Fach	Castle	Medieval
GGAT01227w	Felindre Colliery Engine House	Engine house	POST MEDIEVAL
GGAT01245w	Duplicate of 00865w	-	-
GGAT01246w	Cynghordy Malthouse	Malt house	Unknown
GGAT01334w	Colliery, Near Hafod Las	Colliery	POST MEDIEVAL
GGAT01336w	Airshaft, Mynydd Pysgodlyn	Ventilation shaft	Unknown
GGAT01343w	Birch Rock Upper Colliery	Colliery	POST MEDIEVAL
GGAT01344w	Colliery near Mynydd Garn-Fach	Colliery	POST MEDIEVAL
GGAT01346w	Colliery, Mawr	Colliery	POST MEDIEVAL
GGAT01347w	Colliery, Mawr	Colliery	POST MEDIEVAL
GGAT01348w	Colliery, Mawr	Colliery	POST MEDIEVAL
GGAT01406w	Felindre Pit, Craig Cefn Parc	Colliery	POST MEDIEVAL
GGAT01411w	Rhyd Y Gwin	Settlement	Unknown
GGAT01513w	Y Barracks, Cwm Clydach	House	POST MEDIEVAL
GGAT01514w	Well, Mawr	Well	POST MEDIEVAL
GGAT01515w	Pigsty, Mawr	Pigsty	POST MEDIEVAL
GGAT01516w	Well, Mawr	Well	POST MEDIEVAL
GGAT01517w	Well, Mawr	Well	POST MEDIEVAL
GGAT01519w	Pigsty, Mawr	Pigsty	POST MEDIEVAL
GGAT01520w	Masons Arms Inn, Swansea	Inn	POST MEDIEVAL
GGAT01521w	Llidardau	House, FARMSTEAD	POST MEDIEVAL
GGAT01522w	Tyn y Berllan	Dwelling	POST MEDIEVAL
GGAT01523w	Pont Llechart, Pont Ty Llwdyn	Bridge	POST MEDIEVAL
GGAT01524w	Salem Baptist Chapel, Llangyfelach/ Capel y Bedydd	Chapel	POST MEDIEVAL
GGAT01528w	Penrheolfach, Mawr	Well	POST MEDIEVAL
GGAT01530w	Findspot, Fagwyr Isaf	FINDSPOT	Unknown
GGAT01531w	House, Mawr	House	POST MEDIEVAL
GGAT01535w	Bridge, Mawr	Bridge	POST MEDIEVAL
GGAT01539w	The Mount	House	POST MEDIEVAL
GGAT01540w	Cwm Clydach Woollen Factory, Mawr	Works	POST MEDIEVAL

Record number	Name	Type	Period
GGAT01628w	Graigola Merthyr Colliery (Nixons Works)	Mine	POST MEDIEVAL
GGAT01668w	Mound, Rhyndwy Clydach	firing range	Modern
GGAT01786w	Lower Lliw Reservoir, Swansea	Dam	POST MEDIEVAL
GGAT01880w	Banc Darren Fawr	Natural feature	Unknown
GGAT01962w	Blaent Nant Ddu	Reservoir	POST MEDIEVAL
GGAT01963w	Lower Lliw Reservoir	Reservoir	POST MEDIEVAL
GGAT01986w	Graig Fawr Cairn	Round barrow	Bronze Age
GGAT02032w	Twyn Tyle deserted settlement, Graig Fawr	Deserted rural settlement	Unknown
GGAT02137w	Platform, Craig-y-bedw 3 (PH10) Swansea	Platform	Medieval
GGAT02139w	Platforms, near Blaen-nant-ddu, Cwm Dulais	Deserted rural settlement	Unknown
GGAT02165w	Cathelyd	House,FARMSTEAD	POST MEDIEVAL
GGAT02169w	Ty'r Waun, Mawr	House	POST MEDIEVAL
GGAT02174w	Glyneathryn Uchaf	House	POST MEDIEVAL
GGAT02175w	Ty Llwydyn, Mawr	House	POST MEDIEVAL
GGAT02203w	Upper Lliw Valley Reservoir	Reservoir	POST MEDIEVAL
GGAT02384w	Blaen Nant Ddu Farm	Mill	POST MEDIEVAL
GGAT02385w	Cwmcile Farm	Mill	POST MEDIEVAL
GGAT02387w	Cefn Parc Farm	Mill	POST MEDIEVAL
GGAT02388w	Gweithdy'r Saer, Rhyd-y-gwin	Mill	POST MEDIEVAL
GGAT02389w	Llyn Ifan Farm	Mill	POST MEDIEVAL
GGAT02390w	Twll Y Gwyddel Farm	Mill	POST MEDIEVAL
GGAT02391w	Glyncoch Farm	Mill	POST MEDIEVAL
GGAT02392w	Melin y Cwm/Ffatri Cwm	Mill	POST MEDIEVAL
GGAT02393w	Ty Melin Uchaf Farm	Mill	POST MEDIEVAL
GGAT02394w	Nant Moel Isaf Farm	Mill	POST MEDIEVAL
GGAT02432w	Ceunant Farm	Mill	POST MEDIEVAL
GGAT02433w	Ffynnon Lefrith Farm	Mill	POST MEDIEVAL
GGAT02434w	Glyncasnod	Mill	POST MEDIEVAL

Record number	Name	Type	Period
GGAT02599w	Cairn, Graig Fawr	Cairn	Prehistoric
GGAT02604w	Stone Foundations, Afon Lliw	Enclosure	POST MEDIEVAL
GGAT02750w	Cynghordy Fawr	House	POST MEDIEVAL
GGAT02789.0w	Tor Clawdd Cross Ridge Dyke, Rhyd-y-gwin	Dyke	Early Medieval
GGAT02816.0w	Lliw Valley Railway	Railway	POST MEDIEVAL
GGAT03305w	Possible quarry, Mawr	Quarry	Unknown
GGAT04746w	Penrhydd Wen Quarry	Quarry	POST MEDIEVAL
GGAT05113w	Graig Fawr Cairn	Cairn	Bronze Age
GGAT05290w	Glyneathrym Uchaf	Enclosure	Early Medieval
GGAT05663w	Glyneathrym Mound 1	Mound	Early Medieval
GGAT05664w	Glyneathrym Mound 2	Mound	Early Medieval
GGAT05671w	Croft Llycod	place name	Early Medieval
GGAT05873w	Lower Lliw Reservoir Ruined Structure	STRUCTURE	Unknown
GGAT05874w	Tor Clawdd Banks	EARTHWORK	Unknown
GGAT06232w	Waterwheel Cwmcile Mill, Mawr	water wheel	POST MEDIEVAL
GGAT06908w	Structure, Tawe Tyle	structure	Unknown
GGAT06909w	Old Walls Structure	structure	Unknown
GGAT06910w	Sheepfold, Gerdinen fawr Farmhouse	sheep fold	Unknown
GGAT06912w	Structure, Mawr	structure	POST MEDIEVAL
GGAT06987w	Cwm Clydach mine, Mawr	MINE	MODERN
GGAT07999w	Supermarine Spitfire AR226 crash site	AIR CRASH SITE	MODERN
GGAT08336w	Water Wheel, Rhos Fawr	Water wheel	POST MEDIEVAL
GGAT08337w	Quarry, Darren-serth, Mawr	Quarry	UNKNOWN
GGAT08338w	Air shaft, Maestir-mawr	Air Shaft	MODERN
GGAT08339w	Maes-tir mawr Farmstead	Farmstead	POST MEDIEVAL
GGAT08340w	Ty'r darren, Mawr	Farmstead	POST MEDIEVAL
GGAT08341w	Bwlfa-isaf Farmstead	Farmstead	POST MEDIEVAL
GGAT08342w	Blaen-Myddfai Farmstead	Farmstead	POST MEDIEVAL
GGAT08343w	Blaen-cilau Farmstead, Maestir-mawr	Farmstead	POST MEDIEVAL

Record number	Name	Type	Period
GGAT08344w	Ffynnon Bettws Farmstead, near Blaen-myddfai	-	-
GGAT08345w	Daren Colliery	Colliery	POST MEDIEVAL
GGAT08346w	Quarry, Bwllfa Isaf	Quarry	POST MEDIEVAL
GGAT08466w	Ysgiach-uchaf Farm	FARMSTEAD	POST MEDIEVAL
GGAT08469w	Cefn-myddfai Farm	FARMSTEAD	POST MEDIEVAL
GGAT08470w	Llwyn-Gweno Farm	FARMSTEAD	POST MEDIEVAL
GGAT08476w	Gelli-gron Farm	FARMSTEAD	POST MEDIEVAL
GGAT08479w	Cynghordy-fach Farm	FARMSTEAD	POST MEDIEVAL
GGAT08480w	Pant-y-fallen Farm	FARMSTEAD	POST MEDIEVAL
GGAT08482w	Spite Farm	FARMSTEAD	POST MEDIEVAL
GGAT08483w	Cefn-parc-uchaf Farm	FARMSTEAD	POST MEDIEVAL
GGAT08484w	Penrheol-fawr Farm	FARMSTEAD	POST MEDIEVAL
GGAT08485w	Llwyn-y-domen Farm, Rhyddwen	FARMSTEAD	POST MEDIEVAL
GGAT08487w	Bryn-maen Farm	FARMSTEAD	POST MEDIEVAL
GGAT08488w	Cathelyd-uchaf Farm	FARMSTEAD	POST MEDIEVAL
GGAT08489w	Fagwyr-uchaf Farm	FARMSTEAD	POST MEDIEVAL
GGAT08595w	Ty-llwyd, Mawr	FARMSTEAD	POST MEDIEVAL
GGAT08989w	Capel Pantycrwys, Rhyd-y-gwin	CHAPEL	POST MEDIEVAL
GGAT08990w	Craig Cefn Parc Primary School, Craig Cefn Parc	SCHOOL	POST MEDIEVAL
GGAT08991w	Coal Mine Memorial, Craig Cefn Parc	COMMEMORATIVE MONUMENT	UNKNOWN
GGAT08992w	Elim Chapel, Rhyd-y-Gwin	CHAPEL	POST MEDIEVAL
GGAT08994w	Cottage, Bryn Elim House, Rhyd-y-gwin	COTTAGE	POST MEDIEVAL
GGAT08995w	Rock and Fountain (P.H), Craig Cefn Parc	PUBLIC HOUSE	POST MEDIEVAL
GGAT08996w	Village School, Rhyddwen	SCHOOL	POST MEDIEVAL
GGAT08997w	Coal levels, Cwm Clydach	LEVEL	POST MEDIEVAL
GGAT09000w	Clydach Merthyr Colliery, Craig Cefn Parc	COLLIERY	POST MEDIEVAL
GGAT09001w	Capel Gerasim, Felindre	CHAPEL	POST MEDIEVAL
GGAT09132w	Coal Level, Craig Cefn Parc	LEVEL	POST MEDIEVAL

Record number	Name	Type	Period
GGAT09133w	Coal Level, Craig Cefn Parc	LEVEL	POST MEDIEVAL
GGAT09411w	Tyle coch-bach Farmhouse	FARMSTEAD	POST MEDIEVAL
GGAT09412w	Tyle coch-bach Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09413w	Ceunant Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09414w	Glyn-cashod Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09415w	Ller-fedwen Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09416w	Gerdinen-ganol Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09419w	Bryn-liefrifh Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09420w	Llwyn-Ifan Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09424w	Gelli-gwm-uchaf Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09425w	Gelli-gwm-ishaf Farmstead	FARMSTEAD	POST MEDIEVAL
GGAT09426w	Glyn-eithrin-isaf	FARMSTEAD	POST MEDIEVAL
GGAT10579w	Valve House, Upper Lliw Reservoir	VALVE HOUSE	POST MEDIEVAL
GGAT10580w	Keeper's House, Upper Lliw Reservoir	HOUSE	MODERN
GGAT10692w	Ruins, Craig-y-hooper	STRUCTURE	UNKNOWN
GGAT10694w	Ruin, Lluest-treharne	STRUCTURE	UNKNOWN
GGAT10695w	Ruin, Glen-eithrin-isaf	STRUCTURE	-
GGAT10696w	Ruin, Mawr	STRUCTURE	UNKNOWN
GGAT10697w	Ruin, Mawr	STRUCTURE	UNKNOWN
GGAT10698w	Ruin, Hendy-isaf	STRUCTURE	UNKNOWN
GGAT10699w	Ruin, Mawr	STRUCTURE	UNKNOWN
GGAT10700w	Ruin, Melin-y-cwm	STRUCTURE	UNKNOWN
GGAT10701w	Ruin, Mawr	STRUCTURE	UNKNOWN
GGAT10702w	Walls, Mawr	STRUCTURE	UNKNOWN
GGAT10704w	Ruins, Hendy-uchaf	STRUCTURE	UNKNOWN
GGAT10708w	Walls, Ty-llwydyn	WALL	UNKNOWN

Table 3: List of listed buildings within 5km buffer boundaries

Record number	Name	Grade	Broadclass
11195	The Old Tollhouse	II	Transport
11199	Upper Clydach Aqueduct and Overflow on Swansea Canal	II	Water Supply and Drainage
11201	Trebannws Multi-Overflow & Outlet Sluice from the Swansea Canal	II	Transport
11208	Circular Pigsty at Beili Gras	II	Agriculture and Subsistence
11210	The Water Mill / Melin Felindre	II*	Industrial
11211	Allt-y-fanog	II	Domestic
11740	Wernfadog	II	Domestic
19453	Plas Mawr (formerly known as Cwrt y Ceidrim)	II	Domestic
22087	Capel Gellionnen (Gellionnen and Graig Unitarian Church)	II*	Religious, Ritual and Funerary
22088	Capel Calfaria	II	Religious, Ritual and Funerary
23081	Saron Old Chapel	II	Religious, Ritual and Funerary
26238	Cefnfforest-fawr	II	Domestic
26258	Gwenlais-uchaf	II	Domestic
26259	Barn at Gwenlais-uchaf	II	Agriculture and Subsistence
70909	Alltycham House	II	Domestic
80985	Church of Saint Ciwg	II	Religious, Ritual and Funerary
80987	Circular pigsty at Pen-yr-esgym	II	Agriculture and Subsistence
80990	Gate and gatepiers to Church of St Ciwg	II	Religious, Ritual and Funerary
80991	Gatepiers and gates to Church of Saint Peter	II	Religious, Ritual and Funerary
81058	Bridge over Lower Clydach below Glynmeithrim Uchaf	II	Transport
81059	Circular pigsty at Craig Fawr Farm	II	Agriculture and Subsistence
81060	Cottage attached to Bryn Elim	II	Domestic
81065	Llety Thomas	II	Domestic
81067	Valve tower at Upper Lliw reservoir with bridge and bridge abutment	II	Civil

Record number	Name	Grade	Broadclass
82317	Piers and railings at Calfaria Baptist Chapel	II	
82318	Church of Saint John the Baptist	II	Religious, Ritual and Funerary
82322	Church of Saint Mary	II	Religious, Ritual and Funerary
82323	Swansea Canal aqueduct over the Lower Clydach River	II	Transport
82327	Iron Footbridge over the Swansea Canal	II	Transport
82328	Milestone on S side of High Street	II	Transport
82329	Milestone on NE side of Vardre Road	II	Transport
82330	Statue of Sir Ludwig Mond	II	Commemorative
82331	Manor Park Country House	II	Religious, Ritual and Funerary

Table 4: List of RCAHMW NMRW assets within 2km buffer boundaries

NMRW number	Name	Type	Period
10117	Pantycr wys Independent Chapel, Rhyd Ty Gwin, Craig-Cefn-Parc	CHAPEL	Post Medieval
90554	Twyn Tyle North	QUARRY	Post Medieval
301280	Ring Cairn on Tor Clawdd; Tor Clawdd, Enclosure	ENCLOSURE	Bronze Age
91863	Twyn Tyle Platform	BUILDING PLATFORM	Medieval
13378	Salem, Taironen,	CHAPEL	Post Medieval
800106	Flannel Factory, Abercarn		
19229	Llwyn-Meurig	LONGHOUSE	Post Medieval
544562	2 Plas Avenue, Prestatyn	HOUSE	20th Century
544398	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
91865	Twyn Tyle Platforms	BUILDING PLATFORM	Medieval
405523	Coal Adits, Cwm Clydach	ADIT	Post Medieval
301298	Mynydd Pysgodlyn Round Barrow; Penlle'r Bebyll Ringwork	RING CAIRN	Bronze Age
33311	Cynghordy Malthouse	MALT HOUSE	Post Medieval
700161	Hensol Castle Kitchen Garden, Pontyclun	KITCHEN GARDEN	18th Century
544571	5 Orme View Drive, Prestatyn	HOUSE	20th Century

NMRW number	Name	Type	Period
10123	Elim Baptist Chapel, Craig-Cefn-Parc	CHAPEL	19th Century
91860	Twyn Tyle, Round Cairn	ROUND CAIRN	Bronze Age
800042	Berwyn Factory		
91856	Blaenffynhonnau Hut Circle	HUT CIRCLE	Prehistoric
700109	Pool Park Parkland Landscape, Efenechtyd	PARK	Multiperiod
800532	Marlborough Primary School, Cardiff; Marlborough Road Board School	SCHOOL	19th Century
545024	Llangwryfon deserted settlement	DESERTED RURAL SETTLEMENT	19th Century
19199	Llechart-Fach	HOUSE	Post Medieval
544565	76 Llangland Bay Road, Swansea	HOUSE	20th Century
421639	Cwm Cellfen Area of Extractive Quarrying or Mining	MINING FEATURE	Post Medieval
528557	Aberffrwd, Spoil Tip	SPOIL HEAP	Modern
40902	Rhyndwyclydach Woollen Factory	WOOLLEN MILL	Post Medieval
40898	Cwm Clydach Woollen Factory	WOOLLEN MILL	Post Medieval
33706	Felindre Colliery Pumping Engine House, Lliw Valley	PUMP HOUSE	19th Century; Post Medieval
532175	Troedyrhiw, Quarry I	LEVEL	Post Medieval
105750	Banc Llyn-Mawr (North) Cairnfield	CAIRNFIELD	Unknown
90556	Tor Clawdd, Firing Range	SHOOTING STAND; FIRING RANGE	Post Medieval
516461	Cwm Fforchwen, Stone Pile	SHELTER; CAIRN	Post Medieval; Medieval; Bronze Age
91869	Graig Fawr, Ring Feature	ROUND BARROW	Bronze Age
401603	Tor Clawdd, Causeway	EARTHWORK; EARTHWORK	Post Medieval; Unknown
303989	Tor Clawdd Dyke		Unknown
105743	Twyn Tyle (South), Cairnfield	CAIRNFIELD	Unknown
544570	Ashworth House, 63 Llandudno Road, Llandudno	HOUSE	20th Century
518858	Porth Bodeilias Pier	PIER	Post Medieval
91870	Graig Fawr (East), Burnt Mound	BURNT MOUND	Prehistoric
91867	Graig Fawr Small Cairn	CLEARANCE CAIRN	Unknown
405937	Cwm Clydach Railway; Clydach Rail Road, Clydach	RAILWAY	Post Medieval
412543	Mynydd Pysgodlyn Settlement & Field System, Platform 2	BUILDING PLATFORM	Post Medieval; Medieval

NMRW number	Name	Type	Period
24950	Melin-y-Cwm Grist Mill	CORN MILL	Post Medieval
105744	Graig Fawr (East) Cairn	ROUND BARROW	Bronze Age
544408	Unnamed Wreck	WRECK	Post Medieval
800892	Crannog, Prior Street, Ruthin		
700194	Tytheaston Court Kitchen Garden, Tytheaston	KITCHEN GARDEN	18th Century
544567	1-4 Tanygraig, Forden Road, Montgomery	TERRACED HOUSING	20th Century
96438	Mount Sunday School	SUNDAY SCHOOL	Post Medieval
544555	2 Pwll-y-Min Crescent, Wyndham Park, Glyn Cory Garden Village, Peterson-Super-Ely	TERRACED HOUSE	20th Century
91872	Graig Fawr (East) Cairnfield	CAIRNFIELD	Unknown
700301	Plas Madoc Kitchen Garden, Llanrwst	KITCHEN GARDEN	19th Century
18197	Caenewydd	HOUSE	Post Medieval
700172	Bodorgan Park, Anglesey	PARK	18th Century
406353	Graig Merthyr Railway Incline Summit, Cwm Clydach Railway	RAILWAY	Post Medieval
405511	Felindre Colliery Tramway	TRAMWAY	Post Medieval
24486	Mynydd-y-Gwaia Rifle Range	RIFLE BUTTS	Modern
19207	Lletty Thomas Farmstead	FARMSTEAD	Post Medieval
700050	Glanusk Park, North Lodge, Crickhowell	LODGE	19th Century
531696	Cwm Dyfolog, Level IV	LEVEL	Modern
700135	Cwrt-yr-ala Park, Michaelston-le-pit, Cardiff	PARK	18th Century
519184	Ellesmere	WRECK	20th Century
412541	Mynydd Pysgodlyn, Settlement and Field System	SETTLEMENT; FIELD SYSTEM	Medieval; Post Medieval
90555	Tor Clawdd Quarry, near Pontardawe	QUARRY	Post Medieval
303987	Mynydd Garn Fach, Cairns	CAIRN CEMETERY	Bronze Age
91862	Twyn Tyle Platform	BUILDING PLATFORM	Medieval
91864	Twyn Tyle Platform	BUILDING PLATFORM	Medieval
18766	Gerddin Fawr	HOUSE	Post Medieval
105745	Twyn Tyle (North) Ring Barrow;Graig Fawr Ring Monument	RING CAIRN	Bronze Age
544396	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
544569	White Lodge House, Rickeston	HOUSE	20th Century

NMRW number	Name	Type	Period
544561	Central Fire Station, Westgate Street, Cardiff	FIRE STATION	20th Century
700205	Llanover Park, Llanover	PARK	18th Century
19849	Rhos-Fawr Farmstead	FARMSTEAD	Post Medieval
91871	Mynydd Pysgodlyn Platforms	BUILDING PLATFORM	Medieval
32365	Valve House, Upper Lliw Reservoir	VALVE TOWER	Post Medieval
412546	Mynydd Pysgodlyn Settlement & Field System, Platform 5	BUILDING PLATFORM	Post Medieval; Medieval
544554	Morrison War Memorial, Morrison Park	WAR MEMORIAL	20th Century
800205	Aberhoffnant defended enclosure		
544409	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
412548	Mynydd Pysgodlyn Settlement & Field System, Relict Cultivation	CULTIVATION MARKS	Medieval; Post Medieval
91868	Graig Fawr Small Cairn	CLEARANCE CAIRN	Unknown
91866	Graig Fawr Cairn	ROUND BARROW	Bronze Age
800459	Sketty Library, Swansea	PUBLIC LIBRARY	20th Century
800503	Pant-yr-Oerfa	HOUSE	Post Medieval
521399	Cefn Gwenffrwd, Trackway	TRACKWAY	Post Medieval
544568	Brierly Hill, Parc Thomas, Carmarthen	HOUSE	20th Century
545003	Wiselboom Bridge, Llanelli	BRIDGE	19th Century
800385	Gaergywydd defended enclosure	DEFENDED ENCLOSURE	Iron Age
408265	Llwyn Gweno	HOUSE	Post Medieval
800399	Ty'n Lon, Pentraeth		
33639	Cwm Clydach Woollen Factory	WATER WHEEL	Post Medieval
700192	Fonmon Castle Kitchen Garden, Rhoose	KITCHEN GARDEN	19th Century
15286	Craig-y-Bedw	SETTLEMENT	Medieval
412542	Mynydd Pysgodlyn Settlement & Field System, Platform 1	BUILDING PLATFORM	Medieval; Post Medieval
43140	T-y-Cwm Bridge	BRIDGE	Post Medieval
545001	Gravestone of John Ystumlllyn	GRAVESTONE	18th Century
544395	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
544412	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
800300	Fisher's Huts, Porth Cychod		

NMRW number	Name	Type	Period
412545	Mynydd Pysgodlyn Settlement & Field System, Platform 4	BUILDING PLATFORM	Post Medieval; Medieval
91845	Twyn Tyle Cultivation Ridges	FIELD SYSTEM	Post Medieval; Medieval
419904	Upper Lliw Reservoir	RESERVOIR	19th Century; Post Medieval
15284	Craig-y-Bedw	BUILDING PLATFORM	Medieval
401791	Tor Clawdd, Braided Trackways,	TRACKWAY	Unknown
91844	Mynydd Pysgodlyn, Cairn	ROUND CAIRN	Bronze Age
301259	Cae Castell (Rhyndwyclydach Medieval Earthwork); Nant Llwydyn Motte	EARTHWORK; EARTHWORK	Medieval
545115	Barns at Maesyron Farm, Cefn Gorwydd	FARM BUILDING	19th Century
13376	Sunday School, Craig-Cefn-Parc,	CHAPEL	Post Medieval
410306	Tor Clawdd to Lluest Treharne Anti-Glider Trenches	TRENCH; ANTI AIRCRAFT DEFENCE SITE	20th Century
516506	Cwm Gelliwern, Gully VIX	TRIAL MINE	Post Medieval
544392	Unnamed Wreck	WRECK	Post Medieval
303988	Mynydd-y-Gwair, Cairn	CAIRN	Unknown
410537	Cwm Cellfen, Building Platform	BUILDING PLATFORM	Medieval; Post Medieval
405517	Railway Bed Embankment Alongside River, Cwm Clydach	RAILWAY EMBANKMENT	Post Medieval
405519	Cwm Clydach Railway	RAILWAY EMBANKMENT	Post Medieval
18723	Gelli Cwm Isaf	DWELLING	Post Medieval
18297	Ceunant	FARMHOUSE	Post Medieval
531711	Mynydd Maesteg, Cairn IV	CAIRN	Bronze Age
544558	7 Pwll-y-Min Crescent, Wyndham Park, Glyn Cory Garden Village, Peterston-Super-Ely	TERRACED HOUSE	20th Century
544559	Brecon County Intermediate School for Boys, Cradoc Road, Brecon	SECONDARY SCHOOL	20th Century
18535	Cynghordy Farmstead; Cynghordy-Fawr	FARMSTEAD	Post Medieval
700053	Lymore Hall Walled Garden	WALLED GARDEN	18th Century
405518	Piers for Water Tank, Cwm Clydach	WATER TANK	Post Medieval
800401	Llys Meddyg, Victoria Road, Penygroes	SURGERY	20th Century
800105	Flannel Factory, Abercarn		

NMRW number	Name	Type	Period
412544	Mynydd Pysgodlyn Settlement & Field System, Platform 3	BUILDING PLATFORM	Medieval; Post Medieval
512893	Llyn y Chwarel Header Reservoir	RESERVOIR	Post Medieval
113330	Pentwyn Mawr Cairn	ROUND BARROW	Bronze Age
544405	Unnamed Wreck	WRECK	Post Medieval
544566	Ty'r Ysgol, Llanfihangel-y-Creuddyn	HOUSE	20th Century
32332	Blaenant Ddu, Reservoir	RESERVOIR	Post Medieval
703015	Tal y Sarn Uchaf Quarry Cottages	DWELLING	19th Century
405520	Bridge Abutment, Cwm Clydach.	BRIDGE	Post Medieval
91873	Graig Fawr, Burnt Mound	BURNT MOUND	Prehistoric
800167	The Snowdon Bowl find, Cwm Beudy Mawr	FINDSPOT	Iron Age
15285	Hen-Glawd	HOUSE PLATFORM	Medieval
412547	Mynydd Pysgodlyn Settlement & Field System, Platform 6	BUILDING PLATFORM	Post Medieval; Medieval
544560	District Council Offices, Pontypridd	LOCAL GOVERNMENT OFFICE	20th Century
271008	Chiria	WRECK	Post Medieval
544411	Unnamed Wreck (Fishermen's Fastening)	WRECK	Post Medieval
544632	Unit 1, Dyfi Eco Park	COMMERCIAL OFFICE	20th Century
91837	Mynydd Pysgodlyn, House Platforms	BUILDING PLATFORM	Medieval
800210	Late Bronze Age socketed axe find, Tan-yr-allt		
800143	Ynysmoch defended enclosure cropmark	DEFENDED ENCLOSURE	Iron Age
700301	Plas Madoc Park, Llanrwst	PARK	19th Century
10124	Gerazim Baptist Chapel, Blaen-Gerdinen; Cwmcerdinen	CHAPEL	Post Medieval
700093	Buckland Hall Kitchen Garden, Bwlch, Brecon	KITCHEN GARDEN	19th Century
32348	Lower Lliw Reservoir	RESERVOIR	19th Century; Post Medieval
544557	6 Pwll-y-Min Crescent, Peterston Super Ely	TERRACED HOUSE	20th Century
544563	Gregynog Music Room, Tregynon	MUSIC HALL	20th Century
308115	Ceunant Fach	HOUSE	Post Medieval
544572	Y Goeden, 43 Gors Road, Tywyn	HOUSE	20th Century
544556	4 Pwll-y-Min Crescent, Wyndham Park, Glyn Cory Garden Village, Peterston-Super-Ely	TERRACED HOUSE	20th Century
91861	Twyn Tyle, Round Cairn	ROUND CAIRN	Bronze Age

PRN	Name	Type	Year
GGATE000090	Mawr Earthworks, Felindre Survey	FIELD SURVEY	2005-2006
GGATE000091	Watching Brief Llidiardau, Cwm Clydach	Watching Brief	2005-2006
GGATE000092	Earthworks Lluast Treharne, Cwm Clydach Survey	FIELD VISIT	2005-2006
GGATE000093	Lluast Treharne, Cwm Clydach Evaluation	Evaluation	2005-2006
GGATE000094	Watching Brief Lluast Treharne, Cwm Clydach	Watching Brief	2005-2006
GGATE000095	Lower Clydach River, Cwm Clydach Earthwork Survey	FIELD SURVEY	2005-2006
GGATE000096	Lower Clydach River, Cwm Clydach Earthwork Survey	FIELD SURVEY	2005-2006
GGATE001212	Field visit Graig Fawr burnt mound	Field visit	2006
GGATE001448	Field visit to Glyneathrim	Field visit	2004
GGATE001715	Field visit Penlle'rbebyll Ring Cairn	Field visit	1989
GGATE001714	Field visit Penlle'rbebyll Ring Cairn	Field visit	1985
GGATE001713	Field visit Penlle'rbebyll Ring Cairn	Field visit	2003
GGATE001716	Field visit Penlle'rbebyll Ring Cairn	Field visit	1996
GGATE001743	Field visit Croft Llycod	Field visit	2004
GGATE003828	Mynydd-Y-Gwair	Desk Based Assessment	1992
GGATE004241	Field Visit to Melin-Y-Cwm Grist Mill	Field Visit	2012
GGATE005433	Cross Ridge Dykes of Southeast Wales	FIELD SURVEY	2006