Dragon Energy

EIA Scoping Request

Applicant

Co-ordinating consultant

INFINERGY

Contributing consultants

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1. INTRODUCTION

Purpose of this Scoping Report

1.1 This document presents the proposed scope of the Environmental Impact Assessment (EIA) for the development of Dragon Energy [1] on land to the south of the Dragon LNG Terminal, Waterston, Milford Haven, Pembrokeshire and is submitted on behalf of Milford Energy Limited for Dragon LNG.

1.2 The site is to the south of the Dragon Terminal, a Liquefied Natural Gas (LNG) receiving, storing and regasifying facility which forms a critical part of the UK's energy infrastructure. The proposal would comprise up to three wind turbines co-located with a recently consented solar farm[2], thereby sharing some common infrastructure. Dragon Energy would provide a direct renewable electricity supply to the Terminal, thereby providing long-term power resilience, and reducing carbon emissions.

1.3 As an energy generating station with an installed generating capacity of over 10MW to be co-located with what will soon become an operational solar farm, this is a Development of National Significance (DNS) for which a planning application will be made directly to the Welsh Ministers. Planning and Environment Decisions Wales (PEDW) will process the application, with their role including the provision of an EIA Scoping Direction.

1.4 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.

1.5 In accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (EIA Regulations) (as amended) it is proposed that any such application is accompanied by an Environmental Statement (ES). This scoping request is made in relation to a development of national significance and in accordance with Regulation 33 of the EIA Regulations.

1.6 This Scoping Report has been prepared to identify the likely environmental effects of the Proposed Development which will need to be assessed in detail in the EIA and reported within the ES, which will accompany the planning application. It accompanies a request for a Scoping Direction to PEDW under Regulation 33 of the EIA Regulations, and in accordance with Regulation 33 (2) it includes:

[1] Although some historic survey reports appended to this Scoping Report refer to the 'Wear Point Wind Farm Extension', as it was previously known, they relate to the same development and site.
[2] the two coastal pasture fields which form the main part of the Site have planning permission for a 9.9MW solar farm pursuant to application 21/0986/PA that is anticipated to be implemented shortly

a) A plan sufficient to identify the land;

b) A brief description of the nature and purpose of the development including its location and technical capacity;

c) A description of its likely significant effects on the environment;

d) A statement that the request is made in relation to a development of national significance for the purposes of section 62D of the 1990 Act; and,

e) Such other information or representations as the person making the request may wish to provide or make.

1.7 This Scoping Report has been prepared by Infinergy Ltd and JCTR Ltd with input from the specialist consultants specified in **Table 1.1** below.

1.8 Consultees will note that the Scoping Report contains a number of questions at the end of each topic chapter, to which a response is requested. Not all questions will be relevant to all consultees; therefore, we request that consultees provide feedback only on those questions appropriate to them. The questions should not be considered an exhaustive list, and consequently, consultees are invited to provide further responses on any issue they consider relevant to the Proposed Development. If consultees elect not to respond, it will be assumed that consultees are satisfied with the approach adopted/proposed.

Dragon LNG - The Applicant

1.9 Dragon LNG's purpose is 'To provide our customers with competitive access to the UK's natural gas market through a safe and reliable LNG terminal while remaining profitable and agile in the evolving energy sector'.

1.10 The Dragon LNG terminal itself was designed, engineered and constructed to the highest specification to ensure safety, environmental compliance, reliability and quality. It operates at the highest levels of efficiency using commercially proven technology, equipment and materials.

1.11 Receiving its first LNG cargo on 14th July 2009, Dragon's terminal consists of a jetty, storage tanks and regasification facilities, combined with gas export capabilities for 365 days per year, continuous operation and a maximum gas send out rate to the UK's National Transmission System (NTS) of 7.6 billion cubic metres of gas per annum (bcma).

1.12 The terminal meets peak gas demands, providing clean and reliable energy for millions of commercial and residential UK users.

1.13 Dragon LNG decommissioned the site based gas fired cogeneration plant in 2018, which significantly reduced pollutant emissions, but led to an increased reliance on the electricity grid for electrical power.

1.14 The purpose of the proposed wind turbines is to provide a direct supply of clean renewable energy to the Dragon LNG facility, thereby reducing the sites carbon intensity and improving its long-term energy resilience by providing a more independent and resilient domestic energy supply. The wind turbines would complement the recently consented solar farm, for example by providing renewable generation at night, during the winter or at other times when solar generation falls or is not available and would make good use of the significant wind resource at this coastal location.

1.15 Dragon LNG own the main part of the Site where the wind turbines would be located and have access rights over the remaining land. Dragon LNG would operate and maintain the proposed wind turbines (and previously consented solar farm). The ES will confirm the carbon savings arising from the proposed wind development and the proportion of the Terminal's energy demand that could be met.

1.16 More information on Dragon LNG can be found on the company website here: https://www.dragonlng.co.uk/

Infinergy – Development Manager

1.17 Infinergy is a renewable energy developer with a strong focus on onshore wind development. Infinergy possess in-house expertise along with the experience needed to design, develop, build and operate wind energy schemes. Infinergy's role for this project encompasses development consultancy advice during the consenting, procurement and construction stages. Infinergy currently have a wind farm project portfolio of over 500 megawatts (MW) and were the developers for the existing Wear Point Wind Farm to the east of the proposals, now owned and operated by JLEN.

1.18 For more information on Infinergy please visit http://www.infinergy.co.uk.

The Environmental Impact Assessment (EIA) Team

1.19 Part 5, Regulation 17(4) of the EIA Regulations requires that an Environmental Statement must be prepared by persons with sufficient expertise to ensure the completeness and quality of the statement, and the provision of a statement to confirm such

expertise. The paragraphs below together with the information within **Table 1.1** below provide this information.

1.20 JCTR Ltd is the coordinating EIA Consultant. JCTR Ltd has completed numerous EIA projects including the management of the EIA for a recent solar park DNS application. JCTR Ltd's EIA Co-ordinator has been working in EIA since 2005 and is a Chartered Environmentalist (CEnv), a Chartered Water and Environmental Manager (C.WEM), a Practitioner of the Institute of Environmental Management and Assessment (IEMA) and a Member of the Chartered Institute of Water and Environmental Management (CIWEM).

1.21 Through maintaining membership of IEMA JCTR Ltd ensures it has the required competency to conduct and coordinate EIAs. An appropriate statement will be made in the ES and **Table 1.1** below confirms the appointed specialist consultant team for the project.

Table 1.1 EIA and other specialist consultants

Discipline / ES Chapter[3]	Consultant	First Contact (lead)
Landscape and Visual impact assessment ES Chapter	Barton Wilmore	John Markwell Associate Landscape Architect
Traffic and Transport ES Chapter	Pell Frischmann	Gordon Buchan, Divisional Director
Ecology ES Chapter	Avian Ecology	Howard Fearn, Director
Ornithology ES Chapter		
Noise ES Chapter	Hayes McKenzie	Rob Shepherd, Associate
Historic Environment ES Chapter	Headland Archaeology	Stephen Carter, Senior Heritage Consultant Jen Richards, Senior Heritage Consultant
Safety ES Chapter	Royal Haskoning DHV DNV Services UK Ltd Infinergy	John Drabble, Sector Director; Stefanie Bourne, Business Director; Andrew Fido, Project Director
Geology, ground contamination, hydrology and hydrogeology, dust & air quality - proposed to be scoped out of the ES	Wardell Armstrong	Aidan Harber, Technical Director; Rachel Graham, Hydrology & Hydrogeology Lead; Stephen Holmes, Civil Engineering Lead; Malcolm Walton, Dust & Air Quality Lead

[3] Some matters are to be scoped out as per summary provided in Section 20

Socio-economic -proposed to be scoped out of the ES and included as a supporting report to planning statement	Barton Wilmore	Debbie Mays
Other technical issues proposed to be scoped out of the ES depending on consultation responses: Infrastructure, telecoms and broadcast services, shadow flicker	Pager Power	Danny Scrivener Operations Director

2. ENVIRONMENTAL IMPACT ASSESSMENT

EIA Process

2.1 The EIA is an iterative process of assessment and design, whereby prediction and assessment of effects will inform the eventual design of the Proposed Development, as described in Chapter 3. The Proposed Development can then be refined in order to avoid, reduce or mitigate potential environmental effects where necessary.

2.2 The Environmental Statement, which reports the findings of the EIA, is required to "*describe the likely significant effects*" of a development; effects that are not considered significant do not need to be described to meet the requirements of the EIA Regulations.

2.3 The EIA Regulations implement European Union (EU) Directive 2014/52/EU[4] which amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. EIA is a process which identifies the potential environmental effects of a development and then seeks to avoid, reduce or offset any adverse effects through 'mitigation measures'. EIA follows a series of stages:

- Site selection and feasibility;
- Screening - is an EIA required;
- Pre-application consultation and scoping;
- Baseline studies to establish the current environmental conditions at the Site and identify receptors;
- Identification of potential environmental impacts;
- Mitigation to avoid or reduce the effects through iterative design process;
- Assessment of residual effects;
- Preparation of an Environmental Statement;
- Submission of the Environmental Statement; and, if approved,
- Implementation and monitoring.

2.4 EIA is an iterative process of assessment and design, during which prediction and assessment of potential effects will inform the evolving design of the Development. Consultation, a vital component of the EIA process, continues throughout each stage and contributes both to the identification of potential effects and mitigation measures.

[4] DIRECTIVE 2014/52/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN

Assessment Methodology

2.5 In order to assess the potential effects arising from the Proposed Development, the significance of such effects will be determined. The determination of significance relates to the sensitivity of the resource or receptor being affected and the magnitude of change as a result of the impact. The assessment of effects will combine professional judgement together with consideration of the following.

- The sensitivity of the resource or receptor under construction;
- The magnitude of potential impact in relation to the degree of change which occurs as a result of the Development;
- The type of effect, i.e. adverse, beneficial, neutral or uncertain;
- The probability of the effect occurring, i.e. certain, likely or unlikely; and
- Whether the effect is temporary, permanent and/or reversible.

2.6 A generalised methodology for assessing significant effects is detailed below; however, each individual technical area will have a specific assessment methodology which may vary from that detailed in the following subsections.

Existing baseline, future baseline and cumulative effects

2.7 The existing baseline is a description of the conditions at the present time without the Proposed Development. Key components are thus the operational Dragon Terminal and associated infrastructure, and the various nearby operational wind turbines. These are also shown at **Appendix C** and on **Figure 2** at **Appendix A**.

Table 2.1 Existing baseline projects within close proximity to the Site

Operational and within the existing and future baseline for EIA
Wear Point Wind Farm: four operational wind turbines of 100m to tip to the east of the Site.
Scoveston Park Wind Turbines: two operational wind turbines of 79.6m to tip to the north of the Site
Lower Scoveston Farm Wind Turbine: single operational wind turbine of 74m to tip to the north of the Site
Castle Pill Wind Turbines: a group of three operational wind turbines of 76m to tip to north of site and a further single turbine at Hubberston to north west
Crican Farm Wind Turbine to north west
Expected to be operational and within the future baseline for EIA
Dragon LNG Solar Farm to be located within the same fields

2.8 The future baseline includes any changes expected to occur in the absence of the Proposed Development during the lifetime of the Proposed Development and the continued existence and operation of developments such as the Dragon LNG terminal and the wind turbines in the surrounding area. This future baseline is the basis for the assessment in the EIA.

2.9 For this Site a key consideration is the co-located solar farm (Pembrokeshire County Council (PCC) application reference 21/0986/PA). Following a recent investment decision by Dragon LNG the solar farm is now scheduled for construction over the Spring and Summer of 2022. It is therefore considered to form part of the future baseline for the EIA.

2.10 Consultees are requested to identify other relevant projects that could form part of the future baseline, noting that the different specialist chapters use different approaches to determine whether there is a likely overlap of the Zone of Influence.

Sensitivity of Receptors

2.11 The sensitivity of potential receptors, including the relative importance of environmental features on or near to the Site, will be assessed in line with legislation or statutory designations and/or best practice judgement, standards and guidance

2.12 **Table 2.2** details a framework for determining the sensitivity of receptors. Each technical assessment will specify its own criteria that will be applied during the EIA and details will be provided in the relevant Environmental Statement chapter. Some topics, such as noise and vibration, rely on set numerical thresholds rather than the descriptors set out below. These are set out where relevant in the topic chapters.

Table 2.2: Framework for Determining Sensitivity of Receptors

Sensitivity of Receptor	Definition
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.

Sensitivity of Receptor	Definition
Negligible	The receptor is resistant to change and is of little environmental value.

Magnitude of Impact

2.13 The magnitude of potential impacts will be identified through consideration of the Development, the degree of change to baseline conditions predicted as a result of the Development, the duration and reversibility of an impact and professional judgement, best practice guidance and legislation.

2.14 General criteria for assessing the magnitude of an impact are presented in **Table 2.3**. Each technical assessment will apply its own appropriate criteria during the EIA, with the details provided in the relevant Environmental Statement chapter.

Table 2.3: Framework for Determining Magnitude of Impacts

Magnitude of Impact	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

2.15 If impacts of zero magnitude (i.e. none / no change) are identified, this will be made clear in the assessment.

Significance of Effect

2.16 The sensitivity of the receptor and magnitude and duration of the predicted impacts will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects.

2.17

2.18

2.19 Table **4** summarises guideline criteria for assessing the significance of effects.

Table 2.4: Framework for Assessment of the Significance of Effects

Magnitude of Impact	Sensitivity of Receptor				
	Very High	**High**	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

2.20 Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of EIA, and are shaded in light grey in the above table.

2.21 Zero magnitude impacts upon a receptor will result in no effect, regardless of sensitivity.

Mitigation & Enhancement

2.22 Where the EIA identifies likely significant adverse effects, mitigation measures will be proposed in order to avoid, reduce, offset or compensate for those effects. These mitigation measures may be embedded in the development design or be compensatory. Such embedded mitigation measures may include changes to the scale, layout or design of the Development, redesign of access tracks and other infrastructure; and management and operational measures.

2.23 The strategy of avoidance, reduction, offsetting and compensation seeks:

- First to avoid significant adverse effects;
- Then to minimise those which remain; and
- Lastly, where no other remediation measures are possible, to propose appropriate compensation.

2.24 In addition, enhancement measures may be incorporated into design of the Development to maximise environmental benefits.

Residual Effects

2.25 Taking cognisance of the suggested mitigation (and enhancement) measures, the predicted effects will be re-assessed to determine the residual effects.

Cumulative Effects

2.26 Schedule 4 of the EIA Regulations states that the ES must include a description of the likely significant effects of the development on the environment resulting from '*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'*.

2.27 The Environmental Statement will identify which sensitive resources and/or receptors are likely to be affected by the Proposed Development in combination with other schemes and to what extent, making use of the assessments carried out by others where available.

2.28 For the purposes of the Environmental Statement, it is important to note that the assessment of cumulative effects in relation to existing developments (projects that are built and operational at the time of submission) will be undertaken as part of the assessment of impacts against the existing and future baseline conditions.

2.29 The cumulative effects of the Proposed Development in conjunction with other schemes that have been approved but are not yet in existence/operational will be assessed in the cumulative effects assessment for each topic. The approved projects/developments considered within this cumulative assessment include those that are, at the time of submission:

- Under construction; or
- Permitted, but not yet implemented.

2.30 In order to ensure that these approved development schemes have been considered clearly and explicitly, the assessment of any cumulative effects associated with them will be discussed separately within each topic chapter of the ES.

2.31 Details of the approved developments to be considered as part of the cumulative assessment are provided at **Table 2.5** below and shown in the plan at **Figure 2, Appendix A.**

2.32 In addition, consideration can be given to submitted but undetermined projects where there is an overlap of the Zone of Influence. As a current DNS application with a confirmed site layout located within 5km to the south west of the Proposed Development, the Rhoscrowther Wind Farm DNS application comprises a

cumulative consideration as per the details set out in **Table 2.5** below.

Table 2.5: Cumulative Wind Farm Projects – submitted but not yet determined

Cumulative Wind Farm Projects
Rhoscrowther Wind Farm DNS: amended 21 Jan 2022 to reduce T1 to 126.5m tip, others remain 135m

2.33 The extent of any cumulative assessment relative to each technical assessment is set out in the following sections of this Scoping Report. The potential landscape and visual effects, for example, which relate to the indivisibility of an individual wind farm development scheme, will be much more wide ranging than noise effects which will be limited to receptors in the more immediate vicinity of the Development.

2.34 In relation to some of the technical assessments, specific guidance and policy exists advising that effects associated with existing wind farm developments should be considered cumulatively.

2.35 An initial list of existing baseline, future baseline and cumulative schemes located within c.5 km of the Site is located in **Appendix C** and shown on **Figure 2** in **Appendix A**.

2.36 A suitable cut-off date will be selected following statutory consultation to allow for the identification and assessment of cumulative projects.

Alternatives

2.37 Schedule 4, Paragraph 2 of the EIA Regulations requires a description of the reasonable alternatives (such as project design, technology, location, size and scale) studied by the developer, which are relevant to the Development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of environmental effects.

2.38 Consideration of alternative designs and layout has already begun. The final layout of the Development will be based on a range of technical criteria, such as separation distances between turbines, wind speed, prevailing wind direction, existing infrastructure, topography, ground conditions, local environmental issues and landscape and visual considerations. The identification of these criteria is an iterative process: as they are identified the layout of the Development, including ancillary infrastructure, will undergo a series of modifications to avoid or reduce potential effects through careful design. This process will be set out in the Environmental Statement.

Structure and Content of the Environmental Statement

2.39 The content of the Environmental Statement will broadly follow the specifications detailed within Schedule 4 of the EIA Regulations. The Environmental Statement will consist of three volumes and a Non-Technical Summary (NTS).

- Volume 1 – Main Environmental Statement text;
- Volume 2 – Figures; and
- Volume 3 – Technical appendices.

2.40 The front end of the main Environmental Statement text will include:

- An introduction;
- Description of the site and its surroundings;
- Details of alternatives considered and scheme evolution;
- Description of the Development; and,
- Details of the EIA process and methodology, including a summary of consultation.

2.41 The technical chapters of the Environmental Statement will present details of the assessments undertaken, including any cumulative effects, required mitigation and residual effects. Where there is relevant planning policy, adopted guidance or an important legislative context this will also be set out.

2.42 As set out in the following chapters, the topics proposed to be 'scoped in' for assessment in the EIA as full ES chapters are as follows:

- Landscape and visual
- Ecology
- Ornithology
- Historic Environment
- Noise
- Traffic and Transport
- Safety

2.43 Where topics relate to human receptors and potential impacts to human health, these will be assessed and considered within the relevant technical chapters above, i.e., Noise, Traffic and Transport and Safety, as will any relevant mitigation (such as a Construction Environmental Management Plan) in relation to these.

3. PROJECT DESCRIPTION

Site and Surroundings

3.1 The Site comprises land to the south west and adjacent to the Dragon LNG Terminal, Waterston. **Figure 3.1** below confirms the site location and indicates the key components of the Proposed Development which are described in further detail below. A location plan sufficient to identify the site for the purposes of this EIA Scoping Request is provided at **Figure 1, Appendix A**.

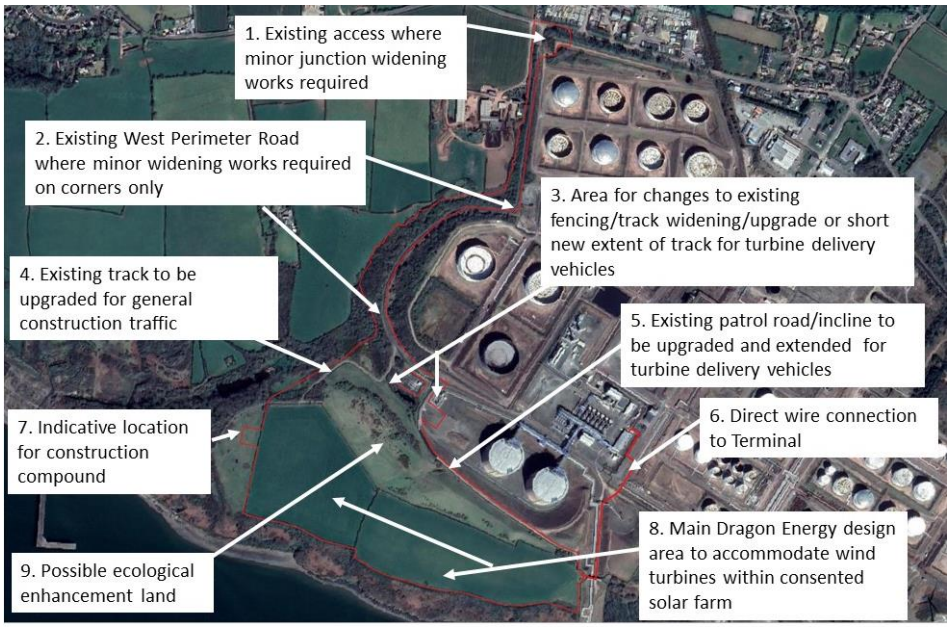

Figure 3.1 Site location plan annotated with key components of the Proposed Development

3.2 At this stage the red line site location plan encompasses an overall area of approximately 29.91 hectares (ha) (the 'Site'), the main part of which comprises two fields of coastal pasture to the south of the existing Dragon Terminal measuring c.14.7 hectares where planning permission was recently granted for a solar farm and the proposed wind turbines are to be located. This area is hereafter termed the 'Dragon Energy Design Area'. All of the land within the Dragon Energy Design Area is owned by Dragon LNG. In terms of the remaining land within the red line, Dragon either has access or other rights over this land, is in discussion with the relevant owner, or it comprises public highway land.

3.3 In terms of access, the current intention is to primarily utilise the Terminal's operational boundary/patrol roads. Thus, all construction traffic would initially use the full length of the existing 'West Perimeter Road' which runs to the west of the Terminal. This would require some minor widening and upgrade works both to the

existing junction with the B4325 and on one intermediate corner in order to accommodate the largest abnormal loads such as the wind turbine delivery vehicles.

3.4 From this point the current intention is for turbine delivery vehicles to use a further existing track to the south of the Terminal to climb the incline to the eastern end of the Dragon Energy Design Area before then transferring to dedicated, purpose-built tracks to access the proposed wind turbine locations. This will require some localised earthworks, track widening, track extension and potentially minor changes to the existing Terminal boundary fencing. It is intended that other construction vehicles would utilise an existing track to access the western end of the Dragon Energy Design Area, where a construction compound is also being considered, before then also transferring to dedicated, purpose-built tracks to access the proposed wind turbine locations. This will again require some localised track widening, reinforcement works and extensions.

3.5 At this stage the steeply sloping land between the Dragon Energy Design Area and the Dragon Terminal has been identified as having potential for mitigation or enhancement purposes, if required. It should be noted that at this early-stage additional land has been included within the red line which will most likely not be required for development, for example between the West Perimeter Road and an existing watercourse to the west. It is anticipated that the final red line location plan for the DNS application will include only the existing track and the areas for minor widening and upgrade works, and thus omit this area.

3.6 As set out above it is relevant that the two coastal pasture fields which form the Dragon Energy Design Area have planning permission for a 9.9MW solar farm pursuant to application 21/0986/PA and that Dragon has made an investment decision to progress construction over the Spring and Summer of 2022. The proposed wind turbines will be designed to be co-located within this solar farm. There are also three visual navigation aids within the Dragon Energy Design Area utilised by ships navigating Milford Haven. These are to be retained as existing. The Pembrokeshire Coastal footpath also passes around the southern boundary of the Dragon Energy Design Area, separated from the Site by a boundary hedgerow/fencing.

3.7 There are also several existing operational wind turbines in the area surrounding the site as shown on **Figure 2, Appendix A**. These form part of the existing baseline and future baseline as they will continue to operate with or without the Proposed Development, as described in section 2 above.

Proposed Development

3.8 The Proposed Development will consist of:

- Wind turbines with associated foundations;
- Upgrades and amendments to the existing Terminal access tracks and boundary fencing;
- On site access tracks and crane pads;
- On site power collection system (transformers and underground cables);
- Substation compound; and,
- Temporary construction compound(s).

Wind Turbines

3.9 As the availability of specific wind turbine models frequently changes due to manufacturers evolving their range in response to market demands, it is not proposed to identify a specific turbine model within the EIA.

3.10 The approach will instead be based upon the identification of a maximum turbine envelope with the key controlling element being a proposed maximum wind turbine tip height. Should the application be approved, it is anticipated that the final wind turbine model would then be selected and confirmed through the discharge of planning conditions attached to the DNS consent, within the parameter of the approved maximum tip height.

3.11 On this basis the realistic worst-case scenario to be used in the assessment is as follows:

- Number of turbines – up to three; and,
- Maximum height to blade tip – 149.9m.

3.12 Current candidate turbines which fit within this maximum envelope have an indicative maximum rotor diameter of up to 136m, and a total generation capacity of between 3.6MW and 4.8MW per turbine. The installed capacity would therefore be in the range of 10.8MW and 14.4MW.

3.13 An indicative turbine layout is shown in **Figure 3**, **Appendix A**. This layout has been developed with due consideration to known constraints, e.g. separation distance from the critical infrastructure within the Dragon LNG Terminal, topography, avoiding the obscuration of the shipping navigation aids on the site, and avoiding oversail of the adjoining landholdings and the coastal footpath.

3.14 For the purposes of the EIA, a precautionary approach will be taken, and the largest prospective turbine will be assessed as the selected

option. The worst-case scenario will be evaluated for each topic, for example the maximum tip height for landscape and visual, the maximum rotor diameter and a lower feasible hub height for ornithology, and the highest noise emission specification.

Access

3.15 The turbine components would be delivered to the Site using the existing road network. The use of public roads will require further consultation with the appropriate bodies.

3.16 Initial site visits and route modelling and inspection suggests that turbine components could be delivered to site from Pembroke Docks and then the A477 Cleddau Bridge, Scoveston Road and B4325 through Waterston Village to site as shown on **Figure 10a** in **Appendix A**. However, a detailed further abnormal loads assessment will be undertaken to determine the most suitable route of turbine delivery to the site. The traffic assessment would determine any requirements for upgrading of junctions or minor roads and would include swept path analysis.

3.17 **Figure 10b** in **Appendix A** shows the indicative access route for construction traffic to and from the site for vehicles not delivering turbine components. Construction traffic will not be permitted to utilise the west of the site access junction on the B4325 due to the sinuous geometry and unsuitable vertical alignment at Black Bridge.

3.18 An access and traffic assessment will be conducted as outlined in **Chapter 10** of this Scoping Report.

Construction of the Development

3.19 The construction phase of the Development will comprise on-site site preparation and construction activities, supported by deliveries of materials, components and staff to the Site.

3.20 Construction is expected to take approximately 6 to 12 months, depending on weather and ground conditions, as well as other technical and environmental factors and is likely to consist of the following principal operations:

- Setting up of a temporary construction compound and welfare / office facilities;
- Preparatory site works, including track upgrades/widening and some limited solar panel demounting and temporary storage where necessary;
- Construction of the substation buildings/compounds;
- Construction of turbine foundations;

- Construction of crane hardstanding areas (these are retained permanently);
- Excavation of cable trenches and cable laying from each wind turbine to the onsite substation;
- Cable laying from the onsite substation to the direct supply point within the Terminal utilising existing racking/conduits;
- Installation of temporary and permanent drainage;
- Erection and commissioning of wind turbines;
- Re-installation of those solar panels previously demounted and stored to facilitate the construction of the turbines; and,
- Removal of temporary construction compound structures and welfare / offices.

Electrical Connection

3.21 As a direct supply project, the wind farm would be connected to the Dragon Terminal initially utilising underground cabling within the Dragon Energy Design Area to the substation, but then within existing racking and conduits approaching and within the Terminal. Each turbine transformer will be located either within the turbine nacelle, within the base of the tower or in a small enclosure at the base of the turbine.

3.22 This short electrical connection to the Dragon LNG site forms part of the project and as such it will be considered as part of this EIA.

Decommissioning

3.23 The Development will be designed to operate for a period of 40 years. Provision will be made for the Development to be decommissioned and the site restored at the expiry of consent. Typically all above ground infrastructure will be dismantled and removed from the site, cables and turbine foundations will be cut 1 m below ground level and covered with topsoil. Alternatively, the Applicant may apply for consent to extend the operational life of the Development in accordance with the relevant legislation at the time of any such application.

4. SITE SELECTION AND DESIGN EVOLUTION

4.1 The Applicant has identified the Site through a review of existing landholdings to determine that which is most appropriate for wind turbines able to provide a direct supply to the existing Dragon LNG terminal.

4.2 This initial design and site selection work has focused on key constraints including: avoiding the oversail of adjoining land, maintaining a sufficient separation distance from critical plant and infrastructure within the Dragon Terminal, avoiding the obscuration of the visual navigation aids located on the Site that are utilised by shipping; avoiding ecological constraints where possible and seeking adequate buffers from other sensitive receptors such as residential properties and the coastal footpath.

4.3 A further objective has been to consider likely landscape and visual (including cultural heritage) impacts, including cumulative impacts arising with the nearby operational wind turbines, whilst also seeking to maximise the renewable energy generation to make the best use of the wind resource at the Site.

4.4 In terms of access, the approach has been to seek and utilise existing access tracks where possible, and therefore to minimise civil engineering works and ecological impacts.

4.5 As the EIA process evolves further iterations of the Site layout will arise and any main iterations will be reported in the EIA.

5. LANDSCAPE AND VISUAL – SCOPED IN

Introduction

5.1 An assessment of the likely significant effects of the Development on landscape character and visual amenity will be undertaken within a dedicated ES chapter.

Consultation

5.2 Consultation will be carried out in parallel with the EIA scoping process with the Landscape Officer at Pembrokeshire County Council to aid agreement on the quantity and location of viewpoints to support the assessment, as well as the extent of the study area, and the methodology proposed for the assessment of landscape and visual effects.

5.3 As part of this scoping exercise, it is anticipated that Natural Resources Wales (NRW) will provide relevant feedback on landscape and visual matters.

Baseline Landscape Conditions

Site Context

5.4 The Site is located in a strongly industrialised coastal landscape between the settlements of Milford Haven (approximately 1.2km west) and Neylands (approximately 2.9km east). It sits on the northern bank of the Milford Haven Waterway (MHW), which forms a dominant natural feature in the landscape.

5.5 The local area is strongly influenced by large scale industrial built development, with the extensive complexes of the Dragon LNG Terminal, Valero Pembroke Oil Terminal (shared site users) and Pembroke Refinery located immediately north-east of the Site and approximately 1.7km south-west of the Site (on the south side of the MHW) respectively. Pembroke Power Station is also located on the southern side of the MHW, approximately 1.8km south of the Site.

5.6 The Site's immediate context also includes existing wind turbines. In terms of turbines greater than 50kW, there are four located to the south-east of the Site, on the southern edge of the Dragon Terminal, and a further six interspersed in the landscape to the north of the B4325 as shown at Appendix A, Figure 2. There also some sub-50 KW turbines in the nearby area.

5.7 Dispersed and sporadic residential settlements are also present outlying the principal areas noted above, albeit they often coalesce

with larger industrial facilities. These include Hazelbeach and Waterston to the north and east of the Dragon LNG Terminal. There is also existing built development in the form of clusters of homes at Pennar Park and Llanreath at a range of 2.2-2.5km from the Site. The settlement of Pembroke Dock is located further south-east, with the eponymous former Royal Navy Dockyard approximately 2.5km south-east of the Site.

5.8 With respect to topography, the Dragon LNG Terminal sits on the southern extent of a gently elevated landscape to the north of the MHW. A marked change in levels defines the landscape to the immediate south of the Site, where pastoral farmland gives way to steep-sided bluffs overlooking the estuary. The wider landscape of Pembrokeshire is typically characterised by a rolling agricultural landscape incised by rivers, with more elevated landform located to the east of Templeton, approximately 20km east of the Site, and in the Preseli Hills, approximately 30m north-east.

Landscape Character

5.9 NRW has developed a series of National Landscape Character Areas (NLCA). The NLCA profiles include an outline of the key characteristics that define these broad areas. The Site is located within NLCA 48: Milford Haven[5], which is described as having a *"complex geological history"* and comprising a flooded valley 'ria landscape' that includes salt marshes, muddy creeks and estuaries. Inland areas are described as *"undulating, lowland, agricultural landscape with a mixture of fields bounded by hedgerow"* while the lower ria is identified as being dominated by oil refineries, jetties and a power station.

5.10 At a local level, the Site is within Landscape Character Area (LCA) 10: The Haven North as defined by the Draft Pembrokeshire Landscape Character Assessment[6]. This assessment has been informed by the all-Wales LANDMAP system.

5.11 LCA 10 is described as an area "once characterised by a diversity of industries and activities, maritime port, trade and fishing" that now contains "two former oil refineries and chemical workings, a large liquefied natural gas installation and many large wind turbines". It also notes that the landscape away from built areas is "dominated by rich pastoral agriculture with a mix of hedgebanks and narrow belts of woodland in valleys" and that the "main leisure route" is the "Wales Coastal Path which runs along the southern edge of the Milford Haven Waterway".

5.12 With respect to LANDMAP, the majority of the Site lies within Visual and Sensory Aspect Area (AA): Hill Mountain, which is described as *"A rolling plateau landscape of gentle hills and valleys between*

[5] Natural Resources Wales (2014).National Landscape Character NLCA48 Milford Haven
[6] Pembrokeshire County Council (2019). Landscape Character Assessment Consultation Draft.

Haverfordwest and Milford Haven. A mixed farmland, dominated by pastoral land use with a mix of hedgebanks, some low cut and some outgrown, with trees and woodland belts in valleys". The AA is identified as 'moderate' under overall evaluation, scenic quality and character within the detailed survey record. The value of the AA is also identified as 'moderate'.

5.13 The northern part of the Site is located within Visual and Sensory AA: Industry/Milford Haven, described as containing *"several separate sites around The Haven which are each dominated by large scale industrial plants"* resulting in a *"dominance of the industrial character over the impression of the likely visitor with some relief provided by attractive views of The Haven"*. The AA is identified as 'low' under overall evaluation, scenic quality, and integrity within the detailed survey record. The value of the AA is also identified as 'low'.

Landscape Designations

5.14 As demonstrated by **Figure 4** of **Appendix A**, the Site is not covered by any designations for landscape or scenic beauty, however the following designations are of note:

- The MHW and the surrounding landscape are within the Milford Haven Landscape of Outstanding Historic Interest;
- The Pembrokeshire Coast National Park (PCNP) encompasses some of the coastal landscape of the study area. At its nearest point, the PCNP lies approximately 2.4km south-west of the Site, however it also includes land to the south, east and north-west of the Site; and,
- There are several Conservation Areas within the study area, the closest of which encompasses the historic core of Milford Haven located approximately 1.7km north-west of the Site. The former Royal Navy dock at Pembroke Dock is also designated as a Conservation Area.

5.15 The Pembrokeshire Coast Path National Trail extends along approximately 300km of the Pembrokeshire coastline, including the northern and southern margins of the MHW. It passes adjacent to the southern boundary of the Site.

Methodology

5.16 The LVIA shall be undertaken 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[7] (GLVIA3).

[7] LI & IEMA (2013). Guidelines for Landscape and Visual Impact Assessment, Third Edition.

5.17 Assessments will be carried out to identify the likely significant landscape and visual effects arising from the Proposed Development during construction, during operation and on decommissioning, with further consideration of residual and cumulative effects.

5.18 The methodology and assessment criteria proposed for the assessment has been developed in accordance with the principles established through best practice documentation. It should be acknowledged that the Guidelines for Landscape and Visual Impact Assessment (GLVIA3) establishes guidelines, not a specific methodology. The preface to GLVIA3 states:

"*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.*"

5.19 The approach has therefore been developed specifically for this assessment to ensure that the methodology is fit for purpose.

5.20 As part of the development of the proposed methodology, consideration has also been given to the following documents:

- Planning Policy Wales[8] and Future Wales: The National Plan 2040[9];
- Guidance Note 46: Using LANDMAP in Landscape and Visual Impact Assessments[10];
- Siting and Designing Wind Farms in the Landscape[11];
- Designing Wind Farms in Wales[12];
- Assessing the Cumulative Impact of Onshore Wind Energy Developments[13]; and
- Pembrokeshire and Carmarthenshire: Cumulative Impact of Wind Turbines on Landscape and Visual Amenity guidance[14].

5.21 The following provides an outline of the key aspects of the assessment.

5.22 The LVIA will provide a review of the existing landscape planning policy context, published sources of landscape character, physical and visual appraisal of the site and study area and an assessment

[8] Welsh Government (2021). Planning Policy Wales
[9] Welsh Government (2021). Future Wales: The National Plan 2040
[10] National Resources Wales (2021). Using LANDMAP in Landscape and Visual Impact Assessments
[11] Scottish Natural Heritage (2017). Siting and Designing Wind Farms in the Landscape Version 3a
[12] Design Commission for Wales (2014). Designing Wind Farms in Wales
[13] NatureScot (2021). Assessing the Cumulative Impact of Onshore Wind Energy Developments
[14] White Consultants (2013). Pembrokeshire and Carmarthenshire: Cumulative Impact of Wind Turbines on Landscape and Visual Amenity guidance

of the likely significant landscape and visual effects arising as a result of the Development.

5.23 Baseline information for the study area will be collated, which will include settlement patterns and access, topography, vegetation, landscape designations, relevant planning policy and published landscape character information including LANDMAP, as well as appraisals of the character of the site and its visual relationship with the study area. Appraisals will be based on an existing baseline year 2022. However, in accordance with Paragraph 2.92.8, the LVIA will consider a future baseline scenario that includes the Dragon LNG solar farm.

5.24 A series of landscape and visual receptors will be identified with a focus on likely significant effects. All receptors will be assessed for their value, susceptibility and resultant sensitivity to development of the type proposed.

Distinction between Landscape and Visual Effects

5.25 In accordance with the published guidance, landscape and visual effects shall 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 Development on the physical and perceptual characteristics of the landscape and its resulting character and quality; and
- Visual effects relate to the effects on the visual amenity of visual receptors and where appropriate, on specific views.

Types of Landscape and Visual Effects Considered

- The LVIA will address all phases of the Development and effects will be considered during the construction phase, when the Development is being built (temporary effects), following completion of the Development (temporary long term effects) and during decommissioning of the Development (temporary effects).
- The LVIA will not only assess the landscape and visual effects associated with the three proposed turbines and their associated foundations, but also effects resulting from the proposed access tracks and crane pads, transformers and underground cables, substation compound and temporary construction compound.
- Consideration shall be given to seasonal variations in the visibility of the Development and these will be described where necessary.

Residential Visual Amenity

5.26 The nearest residential property, Venn Farm, is currently located circa 527 metres from a proposed turbine location. There are very few other potential residential receptors within a 1km radius of the main Dragon Energy Design Area. Therefore, it is considered highly unlikely that the residential visual amenity threshold, as set out in Landscape Institute Technical Guidance Note 2/19, will be met. On this basis we do not consider that a Residential Visual Amenity Assessment is required.

Night-Time Assessment

5.27 Whist there are 25ecognized areas of 'Dark Sky' within the wider area including the necklace of Dark Sky Discovery sites (the nearest being the Kete National Trust Car Park at St Annes Head), the Site is located in a local area dominated by industrial built development and settlement with extensive artificial lighting. Furthermore, the nature of lighting associated with the Development is unlikely to significantly alter the existing night-time baseline given that wind turbines below 150 metres do not require aviation lighting, and accordingly a Night-time Lighting Assessment is proposed to be scoped out.

Cumulative Effects

5.28 The LVIA will also consider the potential for any cumulative effects to arise from onshore wind energy development which are under construction, consented or the subject of a full planning application within a suitable cut-off date following statutory consultation. The requirement for consideration of cumulative effects under the EIA Regulations is set out in Schedule 4, as follows:

"*5. A description of the likely significant effects of the development on the environment resulting from, inter alia: I 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*"

5.29 There is no longer any minimum requirement under the current EIA Regulations to consider the potential for cumulative impacts in relation to other developments which are yet to be awarded consent.

5.30 The Pembrokeshire and Carmarthenshire: Cumulative Impact of Wind Turbines on Landscape and Visual Amenity guidance uses the following definition for cumulative effects (first used in the 2012 SNH guidance):

'the additional changes caused by a proposed development in conjunction with other similar developments or as the combined effect of a set of developments, taken together.'

5.31 The guidance requires an assessment of both combined and additional effects, with the following rationale provided: "the landscapes and seascapes of Pembrokeshire and Carmarthenshire have a range of thresholds of acceptable change for wind energy development beyond which further development would be inappropriate in landscape and visual terms".

5.32 The guidance also sets out when cumulative assessments will be needed: "where the proposed wind turbine development may be seen in conjunction with other wind turbine developments. These developments will include existing, under construction and consented wind turbines and those 'in planning' i.e. at planning application stage".

5.33 However, the guidance also clarifies that "Detailed cumulative impact assessments are only required where it is considered that the proposal could result in significant cumulative impact which could affect the eventual planning decision. The scale and complexity of assessments should be proportionate to the impacts".

5.34 It is therefore proposed to consider in the LVIA cumulative effects caused by the development of the Site in conjunction with other sites which are either operational, under construction, consented or the subject of a full planning application. The GLVIA3 best practice guidelines identify three principal types of cumulative visual impact:

- Combined visibility – the influence of more than one scheme is experienced in a single view by a visual receptor;
- In Succession visibili–y - where two or more schemes are visible from the same location but not within the same view. i.e. an observer at a given location would need to look in distinctly different directions to view more than one scheme; and
- Sequential visibility – where two or more sites are not visible at one location but would be seen as the observer moves along a linear route, for example, a road or PRoW.

Study Areas

5.35 In order to assist with defining the study area, a digital Zone of Theoretical Visibility (ZTV) model was created as a starting point to illustrate the geographical area within which views of development on the Site are theoretically possible. This was based on a 'bare-earth' scenario, whereby the screening effect of areas of existing vegetation or built features in the landscape are not taken into account. The ZTV was modelled to a blade tip height of 150m

(accounting for a worst case scenario for maximum height) and is presented at **Figure 5** in **Appendix A**.

5.36 The ZTV is a useful tool used to provide a focus on the area and receptors that are most likely to be affected by a proposed development, but should always be subject to verification in the field. In this regard, initial site visits were conducted during September 2021 to establish the visibility of the Site within the local landscape within a 3km study area.

5.37 Having regard to NRW GN46 the initial study area has been defined as 25km. This is considered appropriate for the identification of potential significant visual effects for structures between 146 and 175m in height as set out in the above guidance, which state:

"While the extent of visual effects are specific to the development and the landscape in which it sits, for vertical structures such as wind turbines, chimneys and masts, we are able to provide the following distances as starting points for discussion with regulators and stakeholders on search and study areas. These distances are based upon development management cases and evidence reports in relation to vertical structures (NRW, 2016 and White et al 2019)"

5.38 It is considered highly unlikely that significant visual effects will arise from the Development in more distant views.

5.39 For the cumulative assessment, an initial search area of 30km and detailed study area of 10km were considered as per the recommendations set out on the cumulative impact of wind turbines in Landscape and Visual Amenity guidance. However, following a review of these areas and existing and known committed or planned onshore wind developments within them, significant landscape and visual effects are only considered likely to arise from those schemes identified on **Figure 2, Appendix A** and listed in **Appendix C**. This approach is supported by the guidance as set out in Paragraph 5.30 above, i.e. a proportionate focus on likely significant effects.

Proposed LVIA Viewpoint Locations

5.40 It is proposed that the 22 locations set out in **Table 5.1** are included as viewpoints in the LVIA. The locations which are illustrated on **Figure 5**, **Appendix A** represent visual receptors at a range of distances and directions from the Site.

5.41 Representative views are not intended to be exhaustive and will not cover every possible view of the Site and the Development. Rather, they will be selected to proportionately represent the range of views available, taking into account the activity and sensitivity of visual receptors. In accordance with the GLVIA, the assessment of visual effects will be based on the identified visual receptors and not specific views, unless specifically appropriate.

5.42 Potential cumulative schemes have also been considered in the selection of representative viewpoints.

Table 5.1 Proposed Assessment Viewpoints

No	Location	OS Grid Ref	Direction	Receptor Type
1	Pembrokeshire Coast Path west of the Dragon LNG Terminal	SM 92496 05378	South-east	Users of Pembrokeshire Coast Path
2	The Rath, Milford Haven	SM 90941 05614	South-east	Residents / Users of Pembrokeshire Coast Path / Road users
3	Mackerel Quay, Milford Haven	SM 90320 05633	South-east	Visitors to Milford Haven Harbour
4	The Promenade, Neyland	SM 95949 05082	South-west	Residents / Users of Pembrokeshire Coast Path / Road users
5	Cleddau Bridge	SM 97454 04739	West	Road users
6	Public footpath on South Pembrokeshire Golf Course	SM 94855 02951	North-west	Users of PRoW / People undertaking recreation / Residents
7	Pembrokeshire Coast Path north-east of the Pembroke Refinery	SM 91790 03290	North-east	Users of Pembrokeshire Coast Path
8	Pembrokeshire Coast Path north-east of the Pembroke Refinery	SM 89691 03735	North-east	Users of Pembrokeshire Coast Path
9	Lane to the south-west of Pembroke Power Station	SM 92388 01863	North	Road users
10	Pembrokeshire Coast Path north of Angle	SM 86866 03485	North-east	Users of Pembrokeshire Coast Path
11	Pembrokeshire Coast Path near Great Castle Head Lighthouse	SM 84842 06199	East	Users of Pembrokeshire Coast Path
12	B4327, Dale Beach	SM 81170 05933	East	Road users / Users of Pembrokeshire Coast Path / Residents
13	Pembrokeshire Coast Path adjacent to St Ann's Head Lighthouse	SM 80732 02906	East	Users of Pembrokeshire Coast Path / Residents / Visitors to the Lighthouse
14	B4319, near Gupton Farm	SR 89593 98766	North-east	Road users

No	Location	OS Grid Ref	Direction	Receptor Type
15	Public Right of Way to the south of Wogaston	SM 91699 00171	North	Users of PRoW / Road users
16	North Lane, St Twynnells	SR 94786 97659	North	Road users / Residents
17	The Main Keep, Pembroke Castle	SM 98152 01655	North-west	Visitors to the Castle / Residents
18	Lane south of Mount Pleasant Cross	SN 01016 05162	West	Road users
19	Stonelea, Hill Mountain	SM 97928 08240	South-west	Road users / Residents
20	Neyland Road, Steynton	SM 93926 10539	South	Road users / Residents
21	Lane south of Clareston Farm	SM 95381 10168	South-west	Road users
22	Milford Road south-west of Johnston	SM 92783 09874	South	Road users

5.43 Each of the representative viewpoints will be visited to evaluate the nature and sensitivity of views. In addition, the study area will also be extensively visited to consider visibility of the Development as receptors move through the landscape.

5.44 A full list of visual receptors will be identified within the LVIA following agreement of representative viewpoints, a study area and completion of all baseline studies. However, visual receptors are likely to include:

- Users of local roads;
- People walking along the Pembrokeshire Coast Path;
- Users of other PRoW in the local area;
- Residents of homes within the local area;
- People within the Milford Haven and Pembroke Conservation Areas;
- People within the Pembrokeshire Coast National Park; and
- People using PRoW and roads within the wider study area who are likely to have views of the Proposed Development.

Visualisations

5.45 For each of the viewpoints, photography will be undertaken and visualisations will be prepared with reference to the Landscape

Institute's TGN 06/19[15] and SNH's Visual Representation of Wind Farms[16] guidance.

5.46 The visualisations and assessment will consider the largest turbine (both in terms of tip height and rotor diameter) as the worst-case scenario is considered to be the largest variation in scale when compared to the existing Wear Point wind turbines. The visualisations will also include the consented solar farm, where appropriate.

5.47 A digital model will be generated to enable the production of visualisations of the Development from agreed viewpoint locations within the study area to help identify the scale, arrangement and visibility of the proposed turbines and ancillary equipment. The visualisations will be made available with the Environmental Statement chapter.

Assessment of significance

5.48 The viewpoints will be used as the basis for determining the effects on visual receptors within the study area. Receptors for landscape effects will include physical features on the Site as well as Landscape Character Areas from published landscape character assessments and LANDMAP Aspect Areas filtered in accordance with NRW Guidance Note 46.

5.49 The sensitivity of receptors is based on a combination of their value and susceptibility, using professional judgement. The criteria that are used to guide judgements on these aspects are set out below:

Table 5.2 Landscape Value

Level	Criteria
Very Low	Landscape area or feature that is undesignated and in a poor condition and state of disrepair that detracts from the landscape quality.
Low	Landscape area or feature of inconsequential components and characteristics, undesignated and with little or no wider recognition of value, although potentially of importance to the local community.
Medium	Landscape area of common components and characteristics that may be designated at local or borough level for its landscape and visual qualities. A landscape feature that makes a recognisable positive contribution to landscape character.
High	Landscape area of rare or distinctive components and characteristics that may also be nationally designated for scenic beauty. A landscape feature that makes a strong and multifaceted positive contribution to landscape character.

[15] Landscape Institute (2019). Technical Guidance Note 06/19: Visual Representation of Development Proposals.
[16] Scottish Natural Heritage (2017). Visual Representation of Wind Farms

Level	Criteria
Very High	Landscape area of rare or distinctive components and characteristics that may also be internationally acknowledged. A landscape feature that makes a unique positive contribution to landscape character.

Table 5.3 Landscape Susceptibility

Level	Criteria
Very Low	The receptor may exhibit no overriding structure with no relationship to the surrounding context and key characteristics of the area, with the type of development proposed very unlikely to alter the overall integrity of the receptor. It is very likely that published guidelines for development can be readily applied given the nature of the receptor and the type of development proposed.
Low	The receptor may exhibit an incoherent structure with minimal relationship to the surrounding context and key characteristics of the area, with the type of development proposed unlikely to alter the overall integrity of the receptor. It is likely that published guidelines for development can be readily applied given the nature of the receptor and the type of development proposed.
Medium	The receptor may exhibit a varied structure with a tangible relationship to the surrounding context and key characteristics of the area, while the type of development proposed may potentially alter the overall integrity of the receptor. There is a reasonable potential that the published guidelines for development can be applied given the nature of the receptor and the type of development proposed.
High	The receptor may exhibit an establish structure with a direct relationship to the surrounding context and key characteristics of the area, with the type of development proposed likely to alter the overall integrity of the receptor. It is unlikely that published guidelines for development can be readily applied given the nature of the receptor and the type of development proposed.
Very High	The receptor may exhibit a clearly defined structure with a symbiotic relationship to the surrounding context and key characteristics of the area, with the type of development proposed very likely to alter the overall integrity of the receptor. It is very unlikely that published guidelines for development can be applied given the nature of the receptor and the type of development proposed.

Table 5.4 Value of Views

Level	Criteria
Very Low	View from a location that is not designated and with no notable cultural associations attached to the view.
Low	View from a location that is not designated and with limited cultural associations attached to the view.
Medium	View from a location that is within a designated landscape or with notable cultural associations attached to the view.

Level	Criteria
High	View from a location that is within a designated and with notable cultural associations attached to the view, or a view from an expressly recognised viewpoint location (i.e. identified within tourism guides or the Local Plan).
Very High	View from a celebrated location that is likely to be of international importance, either designated or with exceptional international cultural associations.

Table 5.5 Susceptibility of Visual Receptor

Level	Criteria
Very Low	People engaged in an activity and/or at a location where their visual setting is of minimal importance and little or no attention is focussed on the landscape.
Low	People engaged in an activity and/or at a location where their visual setting is unlikely to be important and limited attention is focussed on the landscape.
Medium	People engaged in an activity and/or at a location where their visual setting is incidental to their enjoyment and attention is partly focussed on the landscape.
High	People engaged in an activity and/or at a location where their visual setting is important and the landscape is likely an important focus of their attention.
Very High	People engaged in an activity and/or at a location where their visual setting is of utmost importance and the landscape is the main focus of their attention.

5.50 The overall magnitude of landscape effect will be identified for each receptor through combining judgements relating to factors that contribute to the scale, duration and reversibility of landscape change, based on the criteria set out in **Tables 5.6** and **5.7** below.

Table 5.6 Landscape Scale Criteria

Scale	Criteria
None	No change to the landscape receptor.
Compact	There will likely be change to a limited proportion of the landscape receptor, which will likely not be discernible or have no effect on the integrity of the landscape or the key characteristics of a very localised geographic area.
Modest	There will likely be change to a moderate proportion of the landscape receptor, which will likely result in a perceptible change in the integrity of the landscape or the key characteristics of a discrete geographic area.
Ample	There will likely be change to a high proportion of the landscape receptor, which will likely result in a noticeable change in the integrity of the landscape or the key characteristics of an extended geographic area.

Scale	Criteria
Extensive	There will likely be a wholesale change to the landscape receptor, which will likely result in a fundamental change to the integrity of the landscape or key characteristics of a very wide geographic area.

Table 5.7 Landscape Duration and Reversibility Criteria

Duration	Criteria
None	No change.
Very Short	Likely to be temporary (up to 5 years) and readily reinstated / reversible.
Short	Likely to be temporary but for a longer term (up to 10 years), which can be reinstated / reversible.
Medium	Likely to be of permanence or for an extended temporary period over a generation (i.e. up to 40 years), and/or less readily reinstated / reversible.
Long	Likely to be of permanence with limited prospect of being reinstated / reversed.

5.51 The overall magnitude of visual effect will be identified for each receptor through combining judgements relating to factors that contribute to the scale, duration and reversibility of visual change, based on the criteria set out in **Tables 5.8** and **5.9** below.

Table 5.8 Visual Scale Criteria

Scale	Criteria
None	No change discernible in the composition of the view.
Compact	There will likely be a barely perceptible change in the composition of the view, which is likely to be at considerable distance from the viewer and only glimpsed and/or occupying a limited extent of the view.
Modest	There will likely be a perceptible change in the composition of the view, which may be at some distance from the viewer, or nearby but only glimpsed and/or occupying a discrete extent of the view.
Ample	There will likely be noticeable change in the composition of the view, which may be close to the viewer and/or occupying a sizeable extent of the view.
Extensive	There will likely be a pronounced change in the composition of the view, close to the viewer and occupying a wide extent of the view.

Table 5.9 Visual Duration and Reversibility Criteria

Duration	Criteria
None	Not visible.
Very Short	Likely to be temporary and only intermittently visible.

Duration	Criteria
Short	Likely to be temporary but visible for a continuous period.
Medium	Likely to be of permanence or for an extended temporary period, and/or likely to be only intermittently visible.
Long	Likely to be of permanence and/or visible for a continuous period.

5.52 Magnitude of effect will be defined as None, Very Small, Small, Medium or Large using the matrix set out in **Table 5.10**, below.

Table 5.10 Magnitude Matrix

		Duration				
		None	**Very Short**	**Short**	**Medium**	**Long**
Scale	**None**	None	None	None	None	None
	Compact	None	Very Small	Very Small	Very Small	Small
	Modest	None	Very Small	Small	Small	Medium
	Ample	None	Very Small	Small	Medium	Large
	Extensive	None	Small	Medium	Large	Large

5.53 The assessment of significance is subject to professional judgement and is rated on a scale of Nil through to Major. Intermediate ratings may be identified, where the effect is considered to vary across the range, using professional judgement. In essence, the reported significance indicates how important the effect is likely to be from a landscape and visual perspective.

5.54 Effects of Major or Moderate significance are deemed 'significant' as governed by the EIA Directive (2014/52/EU).

Key Questions for Consultees

5.55 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q5.1: Are there any comments on the proposed list of viewpoint locations?
- Q5.2: Is there agreement on the proposed study area?
- Q5.3: Are there any comments on the proposed approach to visualisations?

- Q5.4: Are there any further wind farm sites not yet constructed, to those listed in **Appendix C**, to consider as part of the cumulative assessment?
- Q5.5: Any landscape or visual receptors of particular concern?

6. ECOLOGY – SCOPED IN

6.1 The Ecology Chapter of the Environmental Statement (ES) will assess the potential effects of the Proposed Development on important ecological features and will detail the proposed mitigation and/or compensation measures required to avoi36ecognizise, restore or offset adverse effects and demonstrate net biodiversity gain.

6.2 This section of the Scoping Report therefore details the proposed approach to baseline ecological information gathering and assessment, in accordance with current best practice industry guidance.

6.3 The existing baseline presented in this Scoping Request Report is as surveyed in 2022. However, in accordance with the Future Baseline section of this document, the Ecology Chapter of the ES will consider a future baseline scenario that includes the Dragon LNG Solar Farm.

6.4 The approach to baseline ornithological information gathering and assessment is discussed separately in **Chapter 7 'Ornithology'**.

Relevant Policy and Legislation

6.5 In the absence of industry guidance published by Natural Resources Wales (NRW) with regards to wind farm developments and nature conservation, the assessment of potential effects upon ecological features will be undertaken with reference to current guidance from NatureScot (formerly Scottish Natural Heritage (SNH)), detailed below.

6.6 The following key pieces of legislation, policy and guidance will therefore be referred to:

- National
    - Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) (hereafter the 'Habitats Regulati'ns')[17];
    - The Wildlife and Countryside Act 1981 (as amended);
    - Protection of Badgers Act 1992;
    - Technical Advice Note 5 – Nature Conservation and Planning[18];
    - The Environment (Wales) Act 2016;

[17] https://www.legislation.gov.uk/uksi/1994/2716/contents/made [Accessed 18/03/2022]
[18] https://gov.wales/sites/default/files/publications/2018-09/tan5-nature-conservation.pdf [Accessed 18/03/2022]

- Future Wales: The National Plan, 2040;
- Planning Policy Wales (2021)[19];
- The United Kingdom Biodiversity Action Plan (UK BAP) Priority Species and Habitats (2007)[20]; and,
- NatureScot (2020) General pre-application and scoping advice for onshore wind farms. Guidance. September 2020[21].

- Local
  - Pembrokeshire County Council Local Development Plan Planning Pembrokeshire's Future (20–3 - 2021)[22].

Study Area

6.7 Study areas for baseline ecological information gathering have been defined with reference to the Site boundary and proposed turbine locations as shown in **Figures 3 and 6b** found in **Appendix A** and have been established in accordance with good practice industry guidance referred to herein.

6.8 Study areas have therefore encompassed the Site and, where appropriate, a series of buffers in accordance with relevant guidance and dependent on the sensitivity of ecological features to potential effects associated with the Proposed Development.

6.9 Further details of study areas are provided below and will be provided in full within the Ecology Chapter of the ES.

Survey Effort

6.10 The following ecological field surveys were completed by BSG Ecology:

- Extended Phase 1 Habitat survey (May 2018);
- Bat survey (five automated detectors deployed for a total of 150 nights between September 2017 and September 2018 inclusive);
- Dormouse *Muscardinus avellanarius* survey (undertaken between mid-May and November 2019 inclusive).

[19] https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 18/03/2022]
[20] https://jncc.gov.uk/our-work/uk-bap-priority-species/ [Accessed 18/03/2022]
[21] https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms [Accessed 18/03/2022]
[22] Pembrokeshire County Council Local Development Plan Planning Pembrokeshire's Future (2013 - 2021) https://www.pembrokeshire.gov.uk/adopted-local-development-plan [Accessed 18/03/2022]
N.B The Authority is now working on a Replacement Local Development Plan for Pembrokeshire. It is anticipated that this Plan will be adopted in 2022 and will run until 2033. https://www.pembrokeshire.gov.uk/local-development-plan-review [Accessed 18/03/2022]

6.11 Ecological survey work to support a proposed extension to the existing wind farm had previously been collected in 2015.

6.12 The following ornithological field surveys were completed by Avian Ecology:

- Extended Phase 1 Habitat survey (June 2021 and March 2022);
- Initial habitat assessment of the Site (April 2021); and,
- Bat activity surveys, comprising ground level activity surveys using static monitoring stations were completed in 2021 during the spring (April to May), summer (June to August) and autumn (September to October).

Baseline Methodology

Desk Study

6.13 A desk study has been undertaken to identify the presence of designated sites for nature conservation and existing records of protected and notable species and habitats within proximity to the Site as follows:

- Non-statutory designated sites for nature conservation within 2km of the Site;
- Statutory designated sites for nature conservation, within 5km of the Site for national sites and extended to 10km for international sites with bat qualifying interests; and,
- Existing records of protected and notable faunal species and habitats, within 2km of the Site (from within the last five years).

6.14 The following additional key sources have been consulted:

- Wear Point Wind Farm Extension: Baseline Ecological Report 2017-2019[23] presented in **Appendix D4**;
- The Multi Agency Geographic Information for the Countryside (MAGIC) website[24];
- Natural Resources Wales (NRW)[25] and Joint Nature Conservation Committee (JNCC)[26] websites;
- Aerial imagery[27] and Ordnance Survey maps;
- West Wales Biodiversity Information Centre (WWBIC)[28]; and,
- Woodland Trust Ancient Tree Inventory[29].

[23] BSG Ecology (2020) Wear Point Wind Farm Extension, Baseline Ecological Reporting 2017 – 2019
[24] https://magic.defra.gov.uk/MagicMap.aspx [Accessed 18/03/2022]
[25] https://naturalresources.wales/?lang=en [Accessed 18/03/2022]
[26] https://jncc.gov.uk/ [Accessed 18/03/2022]
[27] https://www.google.com/maps/ [Accessed 18/03/2022]
[28] https://www.wwbic.org.uk/ [Accessed 18/03/2022]
[29] https://ati.woodlandtrust.org.uk/ [Accessed 14/03/2022]

BSG Ecology Survey Work 2017-2019

6.15 The Site has been subject to recent and extensive ecological surveys undertaken by BSG Ecology[23] between 2017 and 2019, in relation to a previous iteration of the Proposed Development.

6.16 The following baseline ecological studies were undertaken and built on previous surveys undertaken in 2015:

- Extended Phase 1 Habitat survey (2018);
- Bat activity surveys (2018); and,
- Dormouse survey (2019).

6.17 Detailed methodologies, study areas and results of these surveys are presented within **Appendix D4**.

6.18 All surveys were undertaken in accordance with industry standard and species-specific guidance applicable at the time of survey and were completed by suitably competent and qualified ecologists.

6.19 Study areas have provided coverage of the Site and appropriate survey buffers, within which to obtain baseline ecological information to inform the design and assessment of the Proposed Development.

Baseline Surveys

6.20 The existing ecological information pertaining to the Site and surrounding area upon which to inform the design and assessment of the Proposed Development from key sources, is considered extensive.

6.21 Current industry guidance[21] does however, advise that ecological (non-ornithological) surveys should normally be completed no more than 18 months prior to the submission of a planning application.

6.22 Additional ecological surveys have been completed by Avian Ecology Ltd. in 2021 and 2022. This was to ensure that baseline ecological information to be presented within the Ecology Chapter of the ES, provides a contemporary reflection of the status and distribution of ecological features within the Site in accordance with current industry guidance[21], and upon which to base an assessment of potential effects from the Proposed Development.

Extended Phase 1 Habitat Survey

6.23 Surveys to validate and, where necessary, update baseline habitat conditions at the Site and identify vegetation communities of notable importance, including potential habitats listed on Annex 1 of the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (i.e., Habitats Directive) and as

UKBAP Priority Habitats, were undertaken in June 2021 and subsequently in March 2022.

6.24 Surveys followed UK industry standard JNCC Phase 1 Habitat Methodology[30] with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Technical Guidance Series Guidelines for Preliminary Ecological Appraisal – Version 2[31].

6.25 The study area for the Extended Phase 1 Habitat survey was defined as the Site boundary as shown in **Figure 6b** found in **Appendix A.**

6.26 Following a review of the Phase I findings, surveys were extended to include the recording of signs indicative of the presence or potential presence of protected and notable terrestrial mammals, amphibians and reptiles in accordance with good practice guidance[32].

Bat Activity Surveys and Preliminary Roost Assessment

6.27 Surveys to validate and, where necessary, update the bat species assembla40ecognizeing the Site and the spatial and temporal distribution of bat activity, were undertaken in 2021 with reference to the following guidance:

- Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). The Bat Conservation Trust, London[33]; and,
- Joint Agency guidance on 'Bats and Onshore Wind Turbines: Survey Assessment and Mitigation' (2019)[34];

6.28 A preliminary ground-level assessment of suitable structures, buildings and trees within 200m plus blade tip (approximately 350m) of proposed turbine locations, for their potential to support maternity roosts and significant hibernation and/or swarming sites in accordance with Joint Agency guidance[34], was undertaken in June 2021 and subsequently in March 2022. Aerial imagery was used to identify features outside access permissions.

6.29 This included inspection of one building within the Site and another 65m from the Site, comprising the Beacon Control Building and the

[30] JNCC (2010). Handbook for Phase 1 Habitat Survey - a technique for environmental audit. Revised Reprint 2016. JNCC, Peterborough; https://data.jncc.gov.uk/data/9578d07b-e018-4c66-9c1b-47110f14df2a/Handbook-Phase1-HabitatSurvey-Revised-2016.pdf [Accessed 18/03/2022]
[31] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal – Second Edition - https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpea/ [Accessed 18/03/2022]
[32] https://cieem.net/resource/guidance-on-preliminary-ecological-appraisal-gpea/ [Accessed 18/03/2022]
[33] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.
[34] SNH (2019) Bats and onshore wind turbines: survey, assessment and mitigation. Version: August 2021. Prepared jointly by NatureScot (Scottish Natural Heritage), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT) with input from other key stakeholders.

World War ll Pillbox, following survey guidance outlined in Collins (2016). These buildings are shown as Target Note (TN)4 and TN5 respectively on the Extended Phase 1 Habitat plan within **Appendix D2**.

6.30 During survey all exterior elevations of both buildings were inspected for potential access points, and evidence of use (such as staining or droppings). An internal inspection of either building was not possible at the time of either survey. Much of the interior of the World War ll pillbox was however visible without internal access, and is not considered a limitation to survey.

6.31 Bat activity surveys, comprising ground level activity surveys, were completed during the spring (April to May), summer (June to August) and autumn (September to October) activity periods of 2021. Surveys used a total of 3 automated monitoring static stations, which is considered appropriate to the scale and nature of the development in accordance with Joint Agency guidance[34]. Monitoring stations were located within areas of the Site where turbines were most likely to be located.

6.32 In accordance with Joint Agency guidance[34] surveys captured a minimum of 10 consecutive recording nights during each activity period, where conditions were suitable for bat activity.

6.33 Details of the locations and monitoring periods of the static monitoring stations are detailed in **Table D1.1** and **Table D1.2** in **Appendix D1**.

6.34 A preliminary analysis of bat activity survey findings is provided within this chapter. Detailed bat analysis will be undertaken through Kaleidoscope (Wildlife Acoustics)[35] software and manually checked by an experienced ecologist. The data will be uploaded onto EcoBat[36] software and the output from this will form the basis of the impact assessment concerning bats.

Terrestrial Mammal Surveys (excluding bats)

6.35 Walkover searches for signs indicative of the presence or potential presence of protected and notable terrestrial mammals were undertaken during Extended Phase 1 Habitat surveys in June 2021 and March 2022.

6.36 The study area for searches therefore comprised the Site boundary as shown in **Figure 6b** found in **Appendix A.**

6.37 Searches were made with reference to good practice industry standard survey methodologies for the following species:

[35] https://www.wildlifeacoustics.com/products/kaleidoscope-pro [Accessed 18/03/2022]
[36] http://www.ecobat.org.uk/ [Accessed 18/03/2022]

- Badger *Meles meles*[37];
- Otter *Lutra lutra*[38];
- Water vole *Arvicola amphibius* [39]; and,
- Dormouse[40].

Amphibians – Great Crested Newts

6.38 Current industry guidance[21] advises that there are some species that, with standard mitigation including established good practice construction measures, are unlikely to experience significant effects during the construction and operation of onshore wind farms (e.g., invertebrates, reptiles and amphibians).

6.39 Such species therefore do not require surveys to inform an impact assessment, providing appropriate a42ecognizedsed mitigation measures are implemented to ensure legislative compliance. The exception to this advice is with regards the potential presence of European Protected Species (EPS), including great crested newt.

6.40 A Habitat Suitability Index (HSI) assessment of Pond 1 (labelled as P1 and shown as TN1 in the Extended Phase 1 Habitat plan provided within **Appendix D2**) located within the Site, for its potential to support great crested newts was therefore undertaken in March 2022.

6.41 The HSI assessment was undertaken in accordance with standard survey methodology[41] and involved the measurement of ten different indices which, when combined, have been found to provide a good indication of the general suitability of ponds for great crested newts.

6.42 Each of the indices is scored (between 0.01-1) using a series of graphs and figures within the guidance notes (ARG UK, 2010). These scores are then used to calculate an overall Habitat Suitability Score for each pond.

6.43 Final scores relate to pond suitability for great crested newt and range from 'poor' to 'excellent'.

[37] https://www.mammal.org.uk/wp-content/uploads/2016/04/Surveying_Badgers_Mammal_Society.compressed.pdf [Accessed 18/03/2022]
[38] http://publications.naturalengland.org.uk/publication/78009 [Accessed 18/03/2022]
[39] https://gat04-live-1517c8a4486c41609369c68f30c8-aa81074.divio-media.org/filer_public/1e/30/1e3072bf-0ffe-4df2-8ee2-e1af6f66755e/d93_-_water_vole_mitigation_handbook81824175_1.pdf [Accessed 18/03/2022].
[40] English Nature (2006) The Dormouse Conservation Handbook (2nd Edition) EN, Peterborough https://ptes.org/wp-content/uploads/2014/06/Dormouse-Conservation-Handbook.pdf [Accessed 18/03/2022]
[41] Amphibian and Reptile Groups of the United Kingdom, ARG UK Advice Note 5 Great Crested Newt Habitat Suitability Index (2010) https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file [Accessed 18/03/2022]

6.44 The suitability of the terrestrial habitat within the Site was also assessed during Extended Phase 1 Habitat surveys undertaken in 2021 and 2022.

Reptiles

6.45 Formal survey for reptiles is not generally required to inform the assessment of onshore wind farm, providing the implementation of appropriate mitigation to ensure legislative compliance.

6.46 The suitability of habitats within the Site for reptiles was however assessed during the Extended Phase 1 Habitat surveys undertaken in 2021 and 2022 as a matter of good practice. These aimed to identify any areas of possible refugia or any habitat suitable for use by hibernating reptiles which may be preserved as part of scheme design or enhanced as part of the Proposed Development.

Additional Field Surveys

6.47 Presence/absence eDNA surveys in accordance with current guidance[42,43] will be undertaken in spring 2022, at two waterbodies (Pond 1 labelled as P1 and Pond 2 labeled as P2 on the Extended Phase 1 Habitat plan provided in **Appendix D2**) located within 250m of the Site, to determine presence or absence of great crested newts.

6.48 Surveys will be undertaken between mid-April and [3]0th June 2022, in strict accordance with the published technical guidance, by suitably trained, experienced and licensed great crested newt surveyors.

6.49 Full laboratory results will be presented within the Ecology Chapter of the ES.

6.50 Where required in response to changes in scheme design within the Site, an updated terrestrial mammal survey comprising a search for signs indicating the presence of badger activity will be undertaken prior to planning submission.

6.51 No further additional field surveys are proposed.

Baseline Results

6.52 This section provides a summary of the key baseline information which has been used to inform the scope of the impact assessment presented herein.

[42] https://naturalresources.wales/media/3509/guidance-on-use-of-dna-sampling-of-great-crested-newts.pdf [Accessed 18/03/2022]
[43] Biggs J., Ewald N., Valentini A., Gaboriaud C, Griffiths R.A., Foster J., Wilkinson J., Arnett A., Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

6.53 Full details of baseline data collected by BSG Ecology are presented in **Appendix D4**. Full details of the results of baseline surveys undertaken by Avian Ecology Ltd. will be presented within the Ecology Chapter.

Designated Sites for Nature Conservation

6.54 The Site does not form part of any designated site for nature conservation, but is located adjacent to Pembrokeshire Marine/Sir Benfro Forol Special Area of Conservation (SAC) and the Milford Haven Waterway Site of Special Scientific Interest (SSSI).

6.55 Additional statutory designated sites for nature conservation with ecological features of interests, located within 5km of the Site, extended to 10km for those sites with bat qualifying interests are listed in **Table 6.1** and illustrated in **Figures 6a and 6b** in **Appendix A**.

6.56 Sites with ornithological qualifying interests are detailed and discussed separately in **Chapter 7 'Ornithology'** of this EIA Scoping Report.

Table 6.1: Statutory Designated Sites for Nature Conservation

Site	**Distance and Direction**	**Qualifying** Interests/Features
Pembrokeshire Marine/Sir Benfro Forol SAC[44]	Adjacent to Site	Qualifying features: • Lagoons • Allis shad *Alosa alosa* • Twaite shad *Alosa fallax* • Atlantic salt meadows • Estuaries • Grey seal *Halichoerus grypus* • River lamprey *Lampetra fluviatilis* • Shallow inlets and bays • Otter • Intertidal mudflats and sandflats • Sea lamprey *Petromyzon marinus* • Reefs • Subtidal sandbanks • Sea caves • Shore dock *Rumex rupestris*
Milford Haven Waterway SSSI[45]	Adjacent to Site	Milford Haven Waterway is of special interest for its geology, ancient woodland, marine biology, saltmarsh, swamp, saline lagoons, rare and scarce plants and invertebrates, nationally important numbers of migratory waterfowl,

[44] https://naturalresources.wales/media/628961/SAC_UK0013116_Register_Entry001.pdf [Accessed 18/03/2022].
[45] https://naturalresources.wales/media/639589/SSSI_0282_Citation_EN0010ded.pdf [Accessed 18/03/2022]

Site	Distance and Direction	Qualifying Interests/Features
		greater and lesser horseshoe bats *Rhinolophus ferrumequinum* and *R. hipposideros*, and otter. The site extends from the mouth of the Haven at Dale Point and Thorn Island to the upper reaches of the Daugleddau at Haverfordwest in the west and Blackpool Mill in the east. Adjacent towns include Milford Haven and Pembroke Dock.
Gweunydd Somerton Meadows SSSI[46]	3.77km south Separated from the Site by approximately 1.2km of the open water of the estuary	Gweunydd Somerton Meadows is of special interest for its grassland fungi assemblage and unimproved neutral grassland. It is one of the best grassland fungi sites in Wales.
Broomhill Burrows SSSI[47]	4.51km south west	One of Pembrokesh're's largest dune systems with the most extensive and most diverse dune slack vegetation. Species-rich dune grassland overlying Old Red Sandstone is also especially well represented, along with the more mobile elements of dune vegetation. Numerous notable plants occur, including scarce lichens. Notable insects include several rare beetles, flies, bugs and moths.
Limestone Coast of South West Wales/Arfordir Calchfaen De Orllewin Cymru SAC[48]	4.6km south west	Qualifying features: • Dune grassland • Caves not open to the public • Dry heaths • Early gentian *Gentianella anglicais* • Petalwort *Petalophyllum ralfsii* • Greater horseshoe bat • Dry grasslands and scrublands on chalk or limestone • Sea caves • Vegetated cliffs
Arfordir Penrhyn Angle/Angle Peninsula Coast SSSI[49]	5.93km west	Qualifying features: • Dunes • Feeding and over-wintering greater and lesser horseshoe bat • Peregrine falcon *Falco peregrinus*
Pembrokeshire Bat Sites and Bosherton Lakes/Safleoed	8.94km south east	Qualifying features: • Calcium-rich nutrient-poor lakes, lochs and pools

[46] https://naturalresources.wales/media/693735/sssi_4215_citation_en001.pdf [Accessed 18/03/2022].
[47] https://naturalresources.wales/media/660298/SSSI_1136_Citation_EN0015d06.pdf [Accessed 18/03/2022]
[48] https://naturalresources.wales/media/629460/SAC_UK0014787_Register_Entry001.pdf [Accessed 18/03/2022]
[49] https://naturalresources.wales/media/655205/SSSI_0923_Citation_EN0017f83.pdf [Accessed 18/03/2022]

Site	Distance and Direction	Qualifying Interests/Features
d Ystlum Sir Benfro a Llynnoedd Bosherton SAC[50]		• Otter • Greater horseshoe bat • Lesser horseshoe bat

6.57 The WWBIC data did not identify any non-statutory designated nature conservation site within 2km of the Site.

Habitats and Vegetation

Existing Records of Priority Habitats and Notable Vegetation

6.58 Records of Priority Habitat types listed under Section 7 of the Environment (Wales) Act/UK Biodiversity Action Plan were returned by WWBIC, within 2km of the Site.

6.59 The nearest such habitats comprised two areas of Ancient Woodland located partly within and adjacent to the Site, to the west and north west. These are shown as TN10 and TN11 on the Extended Phase 1 Habitat plan included in **Appendix D2**. Information on priority habitats within 2km of the Site is presented in **Table 6.2** below. Where numerous records of a particular habitat were recorded, only the closest record to the Site has been provided, in order to provide context for the Site and surrounding area.

Table 6.2: Priority Habitats – Existing Records

Priority Habitat	Conservation Status	Distance/Orientation of Nearest Record
Coastal Saltmarsh	UKBAP, S7, LBAP	Separated from the Site by approximately 1.2km of the open water of the estuary to the south.
Ancient Woodland	LBAP	Adjacent to Site.

Key

S7: Listed on Section 7 of the Environment (Wales) Act 2016

UKBAP: Listed as a UK Biodiversity Action Plan Priority Habitat

LBAP: Listed as a Pembrokeshire Biodiversity Action Plan habitat

6.60 Records of Veteran Trees located within 2km of the Site, identified from the Woodland Trust Ancient Tree Inventory29 are described in Table 6.3 below.

6.61 No records were returned within the Site, with the nearest record comprising an ash *Fraxinus excelsior* tree located 1.6km to the north-west of the Site.

Table 6.3: Veteran Trees – Existing Records

[50] https://naturalresources.wales/media/673193/pembs-bat-sites-and-bosh-lakes-english.pdf [Accessed 18/03/2022]

Species	Distance and direction from	Description
Ash	1.6km north west	Notable Tree
Ash	1.8km north west	Notable Tree
Beech	1.7km south	Notable Tree

6.62 WWBIC also returned records of native bluebell *Hyacinthoides non-scripta* within 2km of the Site.

Onsite Habitats & Vegetation

6.63 Habitats were mapped and described using a series of 'target notes' (TNs). An Extended Phase 1 Habitat plan is presented on in **Appendix D2** displaying the location of TNs. The details associated with these TNs are also presented in **Appendix D2**.

6.64 The main Dragon Energy Design Area, to the south west of the Dragon LNG terminal, comprises two sloping pasture fields, with boundary hedgerows and stock fencing. These fields are dominated by semi-improved grassland which slope down to the sea and are characterised by abundant perennial ryegrass *Lolium perenne*, sheep's sorrel *Rumex acetosella* and cock's-foot grass *Dactylis glomerata*.

6.65 To the north of these fields is an area of sheep grazed semi-improved neutral grassland and scattered scrub that forms the screening bund. Further north within the Site are areas of scrub, bare ground and hardstanding.

6.66 Hedgerows along the field boundaries of the Site are species-poor and subject to active management, with predominant species comprising hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa*. Scattered trees, including ash, are present within the hedgerow intersecting the two southern fields of the Site, as well as adjacent to the southern Site boundary. At the time of the Extended Phase 1 Habitat survey in March 2022, these trees had all been cut to hedgerow height (approximately 2m).

6.67 The most northerly portions of the Site, along the proposed access track route of the Proposed Development, to the west of the Dragon LNG terminal, comprise areas of scrub, woodland and areas of bare ground and hardstanding belonging to an existing access track.

6.68 A single waterbody (Pond 1 labelled as P1 on the Extended Phase 1 Habitat plan in **Appendix D2**) is located adjacent to the southern boundary of the Terminal, close to an area of potential access track upgrades but well to the north of the Dragon Energy Design Area, beyond the screening bund.

6.69 No protected or notable plant species were recorded on the Site during the habitat survey.

6.70 The wider area predominantly comprises similar agricultural fields together with scattered urban developments.

Bats

BSG Ecology Surveys 2018

6.71 Bat surveys undertaken by BSG Ecology within the Site in 2018, employing the use of ground-level automated monitoring recorded the following species: common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, *Myotis* spp, long-eared bat spp *Plecotus* spp, noctule *Nyctalus noctula*, greater horseshoe bat and lesser horseshoe bat.

6.72 Overall bat activity was found to be strongly associated with boundary features, rather than over open fields of the Site, with soprano and common pipistrelles the most frequently recorded species during the 2018 survey work. Noctule, was the more regularly recorded species over the open fields within the Site.

6.73 The 2018 data suggested that a single/small number of noctules may have roosted on or locally to the Site during the spring survey period. There was no indication of a roost on, or in the immediate vicinity of the Site for either pipistrelle species.

6.74 2018 surveys also suggested that a small number of greater horseshoe bats may have roosted locally to the Site during the spring and summer, with commuting detected at the western boundary of the Site within 40 minutes of (after) sunset and (before) sunrise.

6.75 During surveys by BSG Ecology in 2018, an inspection of the Beacon Control Building and the World War II Pillbox (shown as TN4 and TN5 respectively on the Extended Phase 1 Habitat plan in **Appendix D2)** was also undertaken, for signs of the presence or suitability for roosting bats.

6.76 No evidence of roosting bats (incl. droppings or feeding remains) was recorded at either structure, with the Beacon Control Building found to have negligible bat roost potential[33]. It was observed that the World War II Pillbox had previously undergone work to enhance its suitability for roosting bats however, on inspection was found to have very limited potential to support roosting bats and was given low bat roost potential.

6.77 Full details of surveys undertaken by BSG Ecology are presented in **Appendix D4**.

Avian Ecology Surveys 2021/2022

6.78 Full details and analysis of bat survey results, including Ecobat analysis, will be presented within the Ecology Chapter of the ES.

6.79 In summary, ground level activity surveys using static monitoring stations undertaken in 2021 recorded the following species:

- Barbastelle *Barbastella barbastellus*;
- Common pipistrelle;
- Soprano pipistrelle;
- Noctule;
- Brown long-eared bat *Plecotus auritus*;
- Leisler's *Nyctalus leisleri*;
- Myotis species;
- Nathusius pipistrelle *Pipistrellus nathusii*;
- Greater horseshoe; and,
- Lesser horseshoe.

6.80 Overall, activity was found to be highest in the summer months and lowest in spring.

6.81 Noctule and soprano pipistrelle had the highest median Nightly Pass Rate (NPR, bat passes per hour, per night) at the three monitoring stations overall. Overall, the median NPR indicates that activity was low for all species at all monitoring stations across the Site.

6.82 Activity was highest at static monitoring stations in the west of the Site located in semi-improved grassland adjacent to hedgerow and woodland edge.

6.83 Analysis of the 2021 survey data suggested the possible presence of roosts of common pipistrelle, soprano pipistrelle, *Myotis* spp., noctule, brown long-eared and greater horseshoe within proximity of the Site based on recording of activity within their species-specific emergence times.

6.84 The preliminary ground-level roost assessment, found that the World War ll pillbox (TN5 respectively on the Extended Phase 1 Habitat Plan in **Appendix D2**) was considered to have no more than low potential to support day roosting bats roosting bats, with the interior being bright and airy and the structure offering few opportunities for crevice dwelling species.

6.85 The Beacon Control Building (TN4 respectively on the Extended Phase 1 Habitat Plan in **Appendix D2**) was found to have negligible potential to support roosting bats (the locations of which are shown). No evidence of the presence of roosting bats (including

droppings, feeding remains or staining) were recorded at either structure in 2022.

6.86 A single mature ash tree with low bat roost potential was identified within the Site during Extended Phase 1 Habitat surveys (shown as TN9 on the Extended Phase 1 Habitat Plan in **Appendix D2**)). This tree is located 125m to the north of the nearest proposed turbine location.

6.87 Direct access to the area of Ancient Woodland, along the north western boundary of the Site (TN10 and TN11 on the Extended Phase 1 Habitat Plan in **Appendix D2**)), was restricted during survey. It is however, considered that some tree specimens may have the potential to support roosting bats. Trees are however, located >100m from the nearest proposed turbine and the area of woodland will be unaffected by the development. The temporary compound area which makes up the area of the Site closest to the Ancient Woodland will involve temporary loss of approximately 0.1ha of semi-improved grassland and will not affect the Ancient Woodland.

Terrestrial Mammals (excluding Bats)

Dormouse

6.88 A dormouse survey was undertaken by BSG Ecology in 2019. The survey comprised the placement of nesting tubes within suitable habitats along the access track component of the Site, to the west of the Dragon LNG plant, and within hedgerow habitats in the remainder of the Site. The survey was undertaken in accordance with species-specific guidance[40] with tubes set out in May 2019 and checks made on three occasions between July and November 2019 inclusive.

6.89 No evidence of dormouse was found during the survey work and no records of the species have been identified from additional key sources within 2km of the Site.

6.90 Boundary hedgerows and scrub habitats within the Site do offer some suitable opportunities for dormice however, the predominantly open nature and grassland habitats of the Site are not suitable for the species.

6.91 The primarily low overall suitability of the Site for dormice together with the absence of existing records, including those from recent intensive surveys, suggest that the species is highly unlikely to be present locally.

6.92 No further surveys are proposed and the species will be scoped out of the assessment.

Water Vole

6.93 No records of water vole were identified from key sources within 2km of the Site, and no evidence of this species was recorded during terrestrial mammal searches undertaken in 2021 or 2022.

6.94 Water vole favour riparian habitats and the Site itself does not support any such suitable features. The closest potentially suitable habitat for water vole comprises a waterbody and adjoining channels approximately 60m to the north west of the Site. However, connectivity between this waterbody, the Site and other more suitable habitats in the surrounding area is limited.

6.95 In the absence of existing records and suitable habitats within the Site, water voles are highly unlikely to be present locally.

6.96 No further surveys are proposed and the species will be scoped out of the assessment.

Otter

6.97 No evidence of otter was found during terrestrial mammal searches in 2021 and 2022, and there are no suitable riparian habitats on the Site which may provide foraging, commuting or shelter opportunities for the species.

6.98 WWBIC returned three otter records from within 2km of the Site.

6.99 The Milford Haven Waterway, adjacent to the Site, forms part of Pembrokeshire Marine/Sir Benfro Forol SAC and which is designated in part for the presence of otter. The waterbody and watercourse to the north west of the Site may also be suitable for this species with the surrounding woodland providing opportunities for holt creation.

6.100 As such, whilst otters are known to be present locally, the Site is not considered to provide any value for the species and the species is highly unlikely to be present.

6.101 No further surveys are proposed and the species will be scoped out of the assessment.

Badger

6.102 Signs indicative of the presence of badger, were recorded within the Site during the Extended Phase 1 Habitat survey undertaken by BSG in 2018 (see **Appendix D2**). Twelve records of badger were also returned in the data search from within 2km of the Site, indicating the species widespread presence locally.

6.103 During searches in 2022 evidence of badger activity within the Site was recorded (recently used latrines). However, no in-use breeding locations were found at the time of survey. The grassland areas are

suitable for foraging and the hedgerows could provide opportunities for sett excavation.

Amphibians – Great Crested Newt

6.104 No existing records of great crested newts *Triturus cristatus* were identified from key sources within 2km of the Site.

6.105 One waterbody (P1) exists to the south of the Terminal and north of the screening bund, well to the north of the Main Dragon Energy Design Area. During surveys in 2022 this waterbody was assessed as having a "poor" HSI score. No other waterbodies which could be used by breeding amphibians are present within the Site. One other waterbody (P2) suitable for use by breeding amphibians exists within 250m of the Site. These waterbodies are shown on the Extended Phase 1 Habitat Plan (see **Appendix D2**). All other waterbodies within 250m of the Site were assessed as unsuitable for breeding amphibians due to unsuitable habitat conditions.

6.106 The grassland and hedgerows and scrub within the Site could provide opportunities for amphibians to forage and seek shelter. However, the "poor" HSI score of P1 and that the species is generally considered to be absent from Pembrokeshire[41] means that the species is unlikely to be present locally. eDNA surveys at Ponds P1 and P2 are however proposed for spring 2022, to further determine presence/absence of the species.

Reptiles

6.107 Records of grass snake *Natrix natrix*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis* and adder *Vipera berus* were returned for within 2km of the Site in a review of key sources. All of these species are protected under Schedule 5 of the Wildlife and Countryside Act as well as being UKBAP/S7/LBAP species.

6.108 The semi-improved neutral grassland within the Site is considered to have low value for reptile species. The field boundary habitats such as hedgerows and adjacent woodland do provide opportunities for foraging/hibernation, as does the land adjacent to the northern boundary, which contains several log piles and pools. However, these areas are poorly connected to more extensive areas of suitable reptile habitat.

Other Species

6.109 Records of several invertebrate species as well as hedgehog *Erinaceus europaeus* were returned from a review of key sources within 2km of the Site.

6.110 The majority of habitats within the Site are of a quality or structure whereby they could support notable species or assemblages of

invertebrates. Hedgerows and scrub habitats may however, provide opportunities for hedgehogs.

6.111 A single marsh fritillary butterfly was incidentally recorded within the Site in 2018 by BSG Ecology (see **Appendix D4**). However, no evidence of larval host plan (devil's-bit scabious *Succisa pratensis*) has been found within the Site. In the absence of such, habitats within the Site are unsuitable for supporting a colony of the species, no species-specific surveys are proposed and the species scoped out of the assessment.

Impact Assessment Methodology

6.112 Impact assessment presented within the Ecology Chapter of the ES for ecological features will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance[51].

6.113 The assessment process will include the following stages:

- determination and evaluation of important ecological features;
- identification and characterisation of impacts;
- outlining mitigation measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects; and,
- identification of opportunities for ecological enhancement.

6.114 The Ecology Chapter of the ES will be supported by Technical Appendices and relevant figures, which will provide further and full details of desk studies, consultations and field surveys undertaken to inform the design and assessment of the Proposed Development.

6.115 It will be ensured that sufficient information is presented within the Ecology Chapter of the ES to allow an objective and robust assessment of potentially significant adverse impacts upon important ecological features to take place.

Determining Importance

6.116 The Ecology Chapter of the ES will only assess in detail impacts upon important ecological features which are likely to be significantly affected by the Proposed Development.

[51] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf [Accessed 18/03/2022]

6.117 An assessment of features that are sufficiently widespread, unthreatened and resilient to impacts of the Proposed Development will not be undertaken and justification for "scoping out" will be provided.

6.118 Relevant international, national and local legislation policy and guidance will be referred to in order to determine the importance (or 'sensitivity') of ecological features. In addition, importance will also be determined using professional judgement, specialist consultation advice and the results of baseline surveys and the importance of features within the context of the geographical area.

6.119 Importance will not necessarily relate solely to the level of legal protection that a feature receives, and ecological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

6.120 For the purposes of this assessment the importance (or sensitivity) of an ecological feature will be considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table 6.4** below.

Table 6.4: Importance/sensitivity and geographic scale of ecological feature

Geographic scale of importance	Definition
High - International	Beyond a UK scale, e.g. internationally designated site (SPA, SAC and/ or Ramsar site) or proposed/ candidate site (pSPA or cSAC); large area of a habitat listed in Annex I of the Habitats Directive or smaller areas of such habitat which are essential to maintain the viability of the larger whole, large population of an internationally important species or site supporting such a species (or supplying a critical element of their habitat requirement) or species listed in Annex IV of the Habitats Directive.
High - National	UK: A nationally designated site (e.g., SSSI) or a discrete area which meets the selection criteria for national designation. An area of a priority habitat which constitutes a significant proportion of the UK resource of that habitat or smaller area essential to maintain the viability of that ecological resource. A regularly occurring, nationally significant population of any nationally important species listed as a UK BAP/priority species and Species listed under Schedule 1 or Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive.
Medium – Regional/County	Pembrokeshire: Locally designated sites (Local Nature Reserves, County or Local Wildlife Sites).
Low - Local	Waterston: For example, areas of priority habitat but which are not large enough to meet the criteria for County value, or small but sustainable populations of a protected or notable species. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context e.g., hedgerows.

Geographic scale of importance	Definition
Negligible - Site	Considered within the context of the Site only.

Identification and Characterisation of Impacts

6.121 The identification and characterisation of impacts on important ecological features will be undertaken in accordance with the CIEEM guidelines (2018)[51], with reference made to magnitude (e.g. area or number of individuals to be impacted), extent, duration and reversibility as appropriate as set out in **Table 6.5** below.

6.122 Impacts will be considered during the construction, operational and decommissioning phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures will be implemented.

Table 6.5: Environmental parameters

Environmental Parameter	Description
Magnitude	The 'size' or amount of the impact/effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an impact/effect occurs. The magnitude and extent of an impact/effect may be synonymous
Duration	The time over which an activity or impact is expected to last and associated effect prior to the recovery or replacement of the ecological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration of effect may be longer than the duration of an activity.
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery or mitigation allows recovery within a reasonable timescale. Permanent effects are those which cannot be recreated within the Proposed Development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

6.123 Magnitude of effect will be assessed based on the effects that the Proposed Development would have upon the resource/receptor, within the range of high, moderate, low, negligible, detailed in **Table 6.6** below.

6.124 The judgements on magnitude may need to be adjusted (either up or down) to reflect the duration of the change (i.e., short, medium or long term) and whether it is potentially reversible. The

assessment will also identify areas where no change is anticipated and the resulting effect is described as 'not discernible' or 'none'.

Table 6.6: Magnitude of impact/change

Magnitude	Criteria
High	The change may negatively or positively affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Moderate	Conservation status of a site or species population will not be negatively or positively affected, but some element of the functioning of the site or population might be affected and the change to the site/ population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor negative or positive change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

6.125 The duration of development-related activities and their associated impacts will be described in terms of their predicted duration as short, medium term and long-term as follows, recognising that the actual duration of effects may be different for different species:

- Short-term: defined as 0 - 3 years;
- Medium term: defined as 3 - 15 years; and,
- Long term: defined as > 15 years.

Significant Effects

6.126 Ecological Impact Assessment is defined within the CIEEM guidelines as:

"…a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems."

6.127 The EIA Regulations require the description of the 'likely significant environmental effects of the Proposed Development on the environment'.

6.128 The assessment considers effects at different geographic scales i.e., where effects may be discernible at a local scale but are not considered significant in the context of the EIA Regulations. For the purpose of the assessment, moderate and substantial effects are deemed to be 'significant' in EIA terms unless stated otherwise.

6.129 CIEEM guidelines[51] define a 'significant effect' as an effect that either supports or undermines biodiversity conservation objectives

for 'important ecological features' or for biodiversity in general (i.e., the feature could be positively or negatively significantly affected).

6.130 CIEEM guidelines[51] on ecological impact assessment note that,

"A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

6.131 Potentially significant effects identified will be expressed with reference to an appropriate geographic scale. For example, a significant effect on a nationally designated site is likely to be of national significance. However, the scale of significance does not necessarily always relate to the importance of an ecological feature. For example, an effect on a species which is considered of national importance, may not have a significant effect upon its national population.

6.132 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged.

6.133 For ease of reference, **Table 6.7** below sets out adapted CIEEM terminology, which also shows the equivalent EIA terms.

Table 6.7: EIA regulations and CIEEM terminology used

Effect (standard EIA-related terminology and associated assigned significance)		**Equivalent CIEEM terminology adapted for Ecological Assessment**
Moderate or Substantial Beneficial	Significant	Positive effect on ecological integrity or conservation status at a County, National or International geographic scale
Minor Beneficial	Not Significant	Positive effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only
Negligible and Neutral	Not Significant or Neutral	No discernible or significant effect on ecological integrity or conservation status (e.g., species or habitat).
Minor Adverse	Not Significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate or-Substantial Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.
Moderate or Substantial Beneficial	Significant	Positive effect on ecological integrity or conservation status at a County, National or International geographic scale

Cumulative Assessment

6.134 In the absence of specific Welsh guidance, the potential for cumulative effects on ecological features with other wind farm proposals will be assessed in accordance with NatureScot guidance (2021)[52], restricted to those developments located within the same hydrological catchment(s) or within the known range of mobile species (e.g., bats up to 10km).

6.135 The assessment will encompass the effects of the proposal in-combination with existing developments, either built or under construction; approved developments; awaiting implementation; and, proposals awaiting determination within the planning process with design information in the public domain.

Future baseline

6.136 The future baseline includes any changes expected to occur during the lifetime of the Proposed Development and the continued existence and operation of developments such as the Dragon LNG terminal and the wind turbines in the surrounding area. This future baseline is the basis for the assessment in the Ecology Chapter.

6.137 For this Site a key consideration is the co-located solar farm (PCC application reference 21/0986/PA). As it is expected that the Dragon LNG Solar Farm will be built and operational by the time the Proposed Development is built, it is considered to form part of the future baseline for the Ecology Chapter.

Presentation of Sensitive Information

6.138 Any sensitive data (e.g., breeding raptor locations) will be included in a confidential appendix to the Ecology Chapter of the ES which will not be made publicly available, but will be issued to Planning and Environment Decisions Wales (PEDW).

Approach to Mitigation

6.139 The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ecological features has been part of the iterative design process for the Proposed Development.

6.140 Measures to avoid or otherwise minimise potentially adverse impacts upon ecological features during scheme design have included:

[52] NatureScot (2021) Assessing the Cumulative Impact of Onshore Wind Energy Developments. Available online at: https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments [Accessed 14/03/2022]

- Land-take - Development infrastructure has been designed to minimise the requirement for land-take and the amount of vegetation clearance;
- Waterbody and Watercourse Buffers - A minimum 50m buffer between scheme infrastructure has been applied around all main watercourses in so far as possible having regard to other ecological and non-ecological constraints;
- Construction Environmental Management Plan (CEMP) - A CEMP (or similar) will be in place during the construction, operational and decommissioning phases of the development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the development in line with current industry standard guidance (an indicative contents list for the CEMP can be found at **Figure 11**, **Appendix A)**; and
- Bat Habitat Features - A minimum 50m buffer (from blade tip) has been applied to woodland edge and main watercourses/waterbodies in so far as possible having regard to other ecological and non-ecological constraints.

6.141 Full details of embedded mitigation measures in relation to ecology will be detailed within the Ecology Chapter, together with additional specific measures, where required to further mitigate potentially adverse effects upon ecological features. Where such measures are required, the Ecology Chapter of the ES will present a further assessment of residual effects.

Residual Effects

6.142 Where the EIA proposes measures to mitigate potentially significant adverse effects on ecological features, a further assessment of residual ecological effects, taking into account any ecological mitigation recommended, will be undertaken.

Compensation

6.143 Where significant residual effects still remain, after the adoption of mitigation measures, compensation will be provided. This could include replacement habitat, or habitat improvements which would offset the significant residual effects.

Enhancement

6.144 Suitable principles for biodiversity enhancement which may be delivered as part of the Proposed Development will be outlined within the Ecology Chapter, with view to prescriptive enhancement measures agreed post-consent in consultation with key consultees, and detailed within a Habitat Management Plan (HMP) or similar.

Potential Impacts

6.145 The Ecology Chapter of the ES will consider the potential for significant adverse effects upon important ecological features, which could arise during the construction, operational and decommissioning phases of the Proposed Development.

Construction

6.146 During construction of the Proposed Development, in the absence of additional mitigation, adverse effects upon important ecological features may arise from:

- habitat loss, fragmentation or change as a result of the delivery and installation of development infrastructure; and,
- disturbance, inadvertent killing or injuring of protected or otherwise notable species or inadvertent damage to their breeding sites or resting places.

6.147 Direct construction effects to habitats within the Site relating to habitat loss or fragmentation will be considered in the Ecology Chapter. Indirect effects arising from the construction of the Site could include pollution or nutrient enrichment or hydrological disruption. However, it is considered that these indirect effects would be minimised, if not eliminated, through detailed design of the Proposed Development and the implementation of a CEMP and/or Pollution Prevention Plan (PPP).

6.148 Construction activities are predicted to result in a temporary increase in noise, vibration and human presence within construction areas. Construction will also result in some temporary, localised vegetation clearance, including the possible required trimming of trees, along the access tracks and within the Site to allow for passage of Abnormal Indivisible Loads (AILS) during construction. This has the potential to displace animals from the vicinity of construction areas for the duration of construction works. However, overall construction disturbance would be considered temporary and would occur only when construction activities are taking place.

6.149 An area of woodland, partially made up of two areas of Ancient Woodland designation, was identified to the north west and west of the Site. One area of Ancient Woodland is located partly within the Site to the north west and the other located outside the Site to the west. Direct impacts on the Ancient Woodland are not anticipated as no works are anticipated within this area (see Figure 3.1) with the Site Location Plan for the planning application stage expected to omit these areas (see paragraph 3.5).

6.150 In order to ensure the protection of any bats using trees as roosts within this block of woodland, it will be surveyed via a "vantage point" survey for bats in 2022 in accordance with relevant

guidance[34] as it was not practical to conduct surveys of all individual trees within the land ownership of the applicant. A survey of the World War II Pillbox will also be undertaken in 2022 in accordance with relevant guidance[33].

6.151 There are no anticipated direct or indirect effects on any other designated sites for nature conservation.

Operation

6.152 During operation of the Proposed Development, in the absence of mitigation, impacts upon ecological features to be addressed within the Ecology Chapter of the ES may arise from:

- disturbance to protected or otherwise notable species as a result of operational activities such as vehicular traffic and maintenance works;
- habitat loss or change, inadvertent killing or injuring of protected or otherwise notable species resulting from the potential spillage of pollutants; and,
- interaction of bats with operational turbine blades leading to mortality due to collision or barotrauma.

6.153 Bat activity recorded at the Site in 2018 and 2021 was primarily associated with hedgerow field boundaries, and which is in line with the current understanding of bat behaviors in relation to habitat features.

6.154 Joint Agency guidance[34] currently advises that a 50m buffer distance between turbine blade tip and nearest woodland (or other key habitat feature), should be applied as a basic standard for all species.

6.155 The proposed wind turbines will reach a maximum tip height of 150m with a maximum hub height of 92m, and a maximum 136m rotor diameter. The nearest bat habitat features to each turbine comprise field boundary hedgerows, which reach a maximum of 2.5m in height across the Site.

6.156 Such features would require turbine locations to be sited a minimum of 87.20m away in order to achieve a 50m buffer from blade tips. Should the final turbine specification mean that this buffer distance is not achieved then additional mitigation measures for bats will be discussed where appropriate with reference to Joint Agency guidance[34]. All mitigation measures proposed with respect to bats will be detailed within the Ecology Chapter of the ES.

6.157 The Proposed Development is therefore considered to meet appropriate mitigation requirements for bats.

6.158 In accordance with Joint Agency guidance[34], where appropriate, bat activity data collected in 2021 will be uploaded to EcoBat for detailed analysis of the risk of impact the Proposed Development is likely to have upon bat species associated with relevant designated sites within 10km of the Site, and any species at high risk from wind turbines. Data analysis using EcoBat software will be provided within the Ecology Chapter of the ES and will form the basis of impact assessment concerning bats.

Decommissioning

6.159 Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase and will not be discussed exclusively within the Ecology Chapter of the ES.

Habitats Regulations Assessment

6.160 The Ecology Chapter of the ES will provide sufficient information to inform a Habitats Regulations Assessment (HRA) of the Proposed Development upon designated European sites. This information will also be provided within a separate appendix to the ES.

Pembrokeshire Marine/Sir Benfro Forol SAC

6.161 The Pembrokeshire Marine/Sir Benfro Forol SAC[44], which is located adjacent to the Site to the south, includes several habitat types and species for which the site is designated, as detailed in **Table 6.1** above.

6.162 No direct effects as a result of the Proposed Development will occur within this designation and, with the implementation of inherent standard good practice construction measures and pollution prevention controls, as outlined and implemented via a Construction Environmental Management Plan (CEMP), indirect effects upon qualifying features will not occur.

Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC

6.163 The Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC[50] is located within 10km of the Site, but beyond 11km from the nearest Proposed turbine location. Qualifying features of this designation are detailed in **Table 6.1** above and include greater horseshoe bats and lesser horseshoe bats, as well has otter and calcium-rich, nutrient poor pools, lochs and lakes.

6.164 Overall activity of greater horseshoe bats recorded during bat activity surveys undertaken at the Site in all months except October

were low-moderate, with activity levels increasing to moderate in October. Overall activity of lesser horseshoe bats was recorded at low-moderate levels in July and not recorded at all in any other months.

6.165 As such, in view of the spatial separation between the nearest proposed turbine location, low species activity and opportunities for adequate mitigation, potentially significant effects upon qualifying interests of the Pembrokeshire Bat Sites and Bosherton Lakes/Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton SAC are not likely. The potential for impacts upon horseshoe bats as part of wider populations out with these designations will be discussed within the Ecology Chapter of the ES.

6.166 The Proposed Development is considered sufficiently distant from any other statutory designated site for nature conservation with ecological qualifying interests to preclude likely significant effects, in the absence of any obvious pathway for connectivity.

Scoped Out for Further Assessment

6.167 The above scope is based on the requirement for the EIA to consider likely significant effects of the Proposed Development. Effects that are not likely to be significant do not require assessing under the EIA regulations. CIEEM guidance[51] further allows features to be scoped out if they are not considered as 'important'.

6.168 On review of desk study and field survey information gathered to date, the following ecological features can be scoped out of the assessment:

- Via the implementation of a CEMP and/or Pollution Prevention Plan (PPP) through detailed design of the Proposed Development it is considered that indirect effects on habitats during construction can be scoped out;
- Effects on habitats during construction can be scoped out. Due to the nature of the Proposed Development the requirement for land take is small and is primarily within the consented Dragon LNG Solar farm;
- Effects on habitats during operation can be scoped out. No further damage is anticipated to habitats during operation, and maintenance visits will be rare and unlikely to result in disturbance to protected species;
- Due to the small size and limited habitats within the Site, the amount of similar habitat surrounding the Site and the implementation of a CEMP including all good practice construction measures and necessary pre-construction surveys, effects during construction and operation on badger, otter, water vole, reptiles, hedgehog and invertebrates can be scoped out.

During operation, maintenance visits will be rare and unlikely to result in disturbance to protected species;

- Hazel dormouse can be scoped out, as surveys in 2019 recorded no evidence of this species and they are therefore considered to be absent from the Site; and
- All statutory designated site for nature conservation with ecological qualifying interests within 10km of the Site excluding Pembrokeshire Marine/Sir Benfro Forol SAC and Milford Haven Waterway SSSI can be scoped out of the assessment.

Summary

6.169 **Table 6.8** below summarises the ecological features identified above and the extent to which they will be considered within the Ecology Chapter.

Table 6.8: Summary of ecological features and the extent to which they will be considered within the Ecology Chapter of the ES

Ecological feature	Construction	Operation	Survey requirement?
Designated Sites (only including Pembrokeshire Marine/Sir Benfro Forol SAC and Milford Haven Waterway SSSI)	Scoped in (All other designated sites within 10km are scoped out)	Scoped in (All other designated sites within 10km are scoped out)	Surveys and desk study already undertaken in 2021 deemed sufficient for EIA purposes and no further surveys proposed to inform the EIA baseline
Habitats	Scoped out (subject to eDNA survey results)	Scoped out (subject to eDNA survey results)	Surveys and desk study already undertaken in 2021/2022 deemed sufficient for EIA purposes and no further surveys proposed to inform the EIA baseline
Great crested newt and other amphibians	Scoped out	Scoped in	eDNA surveys required in Spring 2022 Pre-construction surveys and RAMs to be proposed as part of a CEMP, where species presence is confirmed.
Bats	Scoped in	Scoped in	Further surveys of the woodland to the west of the Site will be undertaken in 2022
Badger	Scoped out	Scoped out	Pre-construction surveys and RAMs as part of a CEMP
Hazel dormouse	Scoped out	Scoped out	Pre-construction surveys and RAMs as part of a CEMP
Otter	Scoped out	Scoped out	Surveys and desk study already undertaken in 2021/2022 deemed sufficient for EIA purposes and no

Ecological feature	Construction	Operation	Survey requirement?
			further surveys proposed to inform the EIA baseline
Water Vole	Scoped out	Scoped out	Surveys and desk study already undertaken in 2021/2022 deemed sufficient for EIA purposes and no further surveys proposed to inform the EIA baseline
Reptiles	Scoped out	Scoped out	Pre-construction surveys and RAMs as part of a CEMP
Other species and invasive non-native species	Scoped out Considered in relation to embedded design and standard good practice mitigation measures only and opportunities for biodiversity enhancement.	Scoped out Considered in relation to embedded design and standard good practice mitigation measures only and opportunities for biodiversity enhancement.	Pre-construction surveys and RAMs as part of a CEMP

Key Questions for Consultees

6.170 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q6.1: In the absence of guidance published by NRW, do consultees consider NatureScot guidance (2020)[21] to be the most appropriate industry guidance to refer to?
- Q6.2: Do consultees consider any additional pieces of legislation, policy or guidance need to be referred to as part of the ecological assessment?
- Q6.3: Do consultees agree that the range of surveys carried out to date and proposed is sufficient and appropriate to inform the design and assessment of the Proposed Development?
- Q6.4: Are the baseline survey methods followed and study areas used appropriate to the nature and location of the Proposed Development?
- Q6.5: Do consultees agree that no additional species-specific surveys are required?
- Q6.6: Are there any other relevant key sources of information that should be contacted or reviewed with respect to baseline ecological information gathering and assessment?

- Q6.7: Do consultees agree with the proposed assessment of the potential effects as a result of the Proposed Development, including the approach to cumulative assessment?
- Q6.8: Are there any specific non-wind energy developments that consultees consider should be included within the cumulative impact assessment?
- Q6.9: Do consultees agree with the outlined scope whereby additional surveys can be limited to eDNA surveys to inform potential presence/absence of great crested newt and population surveys would not be required to inform appropriate mitigation, if species presence is identified?
- Q6.10: Do consultees agree with the outlined scope whereby additional terrestrial mammal surveys, where required in response to any changes to scheme design, will be limited to searches for signs of badger given the established likely absence of other mammal species?
- Q6.11: Is the list of potential impacts and key sensitive receptors comprehensive?
- Q6.12: Are the proposed receptor evaluation and impact assessment methods considered appropriate and comprehensive?
- Q6.13: Do consultees agree that Ecobat analysis can be restricted to qualifying features of the Milford Haven Waterway SSSI and species at high risk of collision?
- Q6.14: Do consultees agree that, with the exception of Pembrokeshire Marine/Sir Benfro Forol SAC and Milford Haven Waterway SSSI, potentially significant effects upon statutory designated sites for nature conservation (with ecological features of interest) can be precluded?
- Q6.15: Do consultees agree that direct and indirect effects upon qualifying habitat features of the SAC/SSSI on the basis of scheme design and embedded pollution prevention measures will not occur?

7. ORNITHOLOGY – SCOPED IN

7.1 The Ornithology Chapter of the Environmental Statement (ES) will assess the potential effects of the Proposed Development on important ornithological features and will detail the proposed mitigation and/or compensation measures required to avoid, minimise, restore or offset adverse effects and demonstrate ornithological enhancement.

7.2 This section of the Scoping Report therefore details the proposed approach to baseline ornithological information gathering and assessment, in accordance with current best practice guidance.

7.3 The receptors that will be the focus of the ornithological assessment will include:

- Relevant statutory designated sites for nature conservation, and their cited qualifying ornithological interests, including Sites of Special Scientific Interest (SSSIs) and Special Protection Areas (SPAs); and,
- Bird species listed on Annex I of the EC Habitats Directive or Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) or a priority for conservation listed on the Welsh Government list of habitats and species of principal importance in Wales (known as the Section 7 lists[53]) and considered to be sensitive to onshore wind farm developments.

7.4 The existing baseline presented in this Scoping Request Report is as surveyed in 2022. However, in accordance with the Future Baseline section of this document, the Ornithology Chapter of the ES will consider a future baseline scenario that includes the Dragon LNG solar farm.

Relevant Policy and Legislation

7.5 In the absence of industry guidance published by Natural Resources Wales (NRW) with regards to wind farm developments and nature conservation, the assessment of potential effects upon ornithological features will be undertaken with reference to current guidance from NatureScot (formerly Scottish Natural Heritage (SNH)), detailed below.

7.6 The following key pieces of legislation, policy and guidance are therefore referred to:

- National
    - Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species

[53] https://www.biodiversitywales.org.uk/environment-wales-act [Accessed 22/03/2022]

(Amendment) (EU Exit) Regulations 2019) (hereafter the 'Habitats Regulations')[54];

- The Wildlife and Countryside Act 1981 (as amended);
- Future Wales: The National Plan 2040;
- The Environment (Wales) Act 2016;
- Planning Policy Wales (2021)[55];
- The United Kingdom Biodiversity Action Plan (UK BAP) Priority Species and Habitats (2007)[56];
- NatureScot guidance (SNH, 2017) on bird survey methods at onshore wind farms[57];
- NatureScot guidance (SNH, 2018) on assessing significance of impacts from onshore wind farms outwith designated areas[58]; and,
- NatureScot (NatureScot, 2020) general pre-application and scoping advice for onshore wind farms[59].

- Local
  - Pembrokeshire County Council Local Development Plan Planning Pembrokeshire's Future (2013 - 2021)[60].

Study areas

7.7 Study areas for baseline information gathering have been based upon proposed turbine locations and Site boundary as shown in **Figure 7** found in **Appendix A**, extended using appropriate survey buffers to capture flight activity and nest sites for Target Species, in accordance with current industry standard guidance and which are detailed herein[56,57].

[54] https://www.legislation.gov.uk/uksi/1994/2716/contents/made [Accessed 22/03/2022]
[55]https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf [Accessed 22/03/2022]
[56] https://jncc.gov.uk/our-work/uk-bap-priority-species/ [Accessed 22/03/2022]
[57] SNH (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms. Scottish Natural Heritage, Edinburgh. March 2017 https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms [Accessed 22/03/2022]
[58] SNH (2018) Assessing Significance of Impacts from Onshore Wind Farms Outwith Designated Areas https://www.nature.scot/doc/guidance-assessing-significance-impacts-bird-populations-onshore-wind-farms-do-not-affect-protected [Accessed 22/03/2022]
[59] NatureScot (2020) General pre-application and scoping advice for onshore wind farms https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms [Accessed 22/03/2022]
[60] Pembrokeshire County Council Local Development Plan Planning Pembrokeshire's Future (2013 - 2021) https://www.pembrokeshire.gov.uk/adopted-local-development-plan [Accessed 22/03/2022]
N.B The Authority is now working on a Replacement Local Development Plan for Pembrokeshire. It is anticipated that this Plan will be adopted in 2022 and will run until 2033. https://www.pembrokeshire.gov.uk/local-development-plan-review [Accessed 22/03/2022]

Baseline Survey and Desk Study Methodology

Desk Study

7.8 A desk study was undertaken in 2021 to identify existing information on the presence of designated sites for nature conservation with ornithological interests and protected and notable bird species within proximity to the Site.

7.9 The following key sources were consulted:

- BSG Ecology (2020) Wear Point Wind Farm Extension, Baseline Ecological Reporting 2017 – 2019[61];
- Aerial imagery[62] and Ordnance Survey maps;
- Natural Resources Wales (NRW)[63] and Joint Nature Conservation Committee (JNCC)[64] websites;
- The Multi Agency Geographic Information for the Countryside (MAGIC) website[65];
- NatureScot guidance 'General pre-application/scoping advice to developers of onshore wind farms' (NatureScot, 2020[59]);
- Aderyn: the Biodiversity Information and Reporting Database of Local Environmental Records Centres Wales[66]; and,
- West Wales Biodiversity Information Centre (WWBIC)[67].

7.10 Information was sought as follows:

- Non-statutory designated sites for nature conservation within 2km of the Site;
- Statutory designated sites for nature conservation, within 5km of the Site, extended to 10km for international sites; and,
- Records of protected and notable ornithological species, within 2km of the Site (from within the last five years).

7.11 Notably, the Site and surrounding area has been subject to recent extensive ornithological studies as part of investigations into a previous iteration of the Proposed Development. These surveys were undertaken by BSG Ecology between September 2017 and August 2018, and built on previous ornithological survey work undertaken in 2015.

7.12 Ornithological surveys completed by BSG Ecology between September 2017 and August 2018 comprised:

[61] BSG Ecology (2020) Wear Point Wind Farm Extension, Baseline Ecological Reporting 2017 – 2019
[62] https://www.google.com/maps/ [Accessed 22/03/2022]
[63] https://naturalresources.wales/?lang=en [Accessed 22/03/2022]
[64] https://jncc.gov.uk/ [Accessed 22/03/2022]
[65] https://magic.defra.gov.uk/MagicMap.aspx [Accessed 22/03/2022]
[66] https://aderyn.lercwales.org.uk/ [Accessed 22/03/2022]
[67] https://www.wwbic.org.uk/ [Accessed 22/03/2022]

- Vantage Point (VP) flight activity surveys (September 2017 to August 2018); and,
- Peregrine scoping survey (2018).

7.13 Detailed methodologies and results of BSG Ecology survey work is provided in **Appendix D4** and summarised, as appropriate, within this Chapter.

7.14 All surveys were undertaken in reference to current industry and appropriate species-specific guidance[56].

Baseline Surveys

7.15 Current industry guidance[57,58] advises that a minimum of two years of ornithological survey data should be collated to inform the design and assessment of onshore wind farm developments. This is unless adequate and recent site-specific information exists or a shorter period of survey can be demonstrated as sufficient.

7.16 Ornithological surveys undertaken for a previous iteration of the Proposed Development and detailed in **Appendix D4** are considered comprehensive in establishing the assemblage and distribution of Target Species utilizing the Site and immediate surrounding area, and which may be affected by the Proposed Development.

7.17 Additionally, baseline ornithological surveys were undertaken by Avian Ecology Ltd. between March 2021 and March 2022 to ensure that baseline information remained a contemporary reflection of Target Species activity, in accordance with good practice.

7.18 The scope of surveys and target species for survey and recording were identified through a review of existing information obtained from key sources (above), knowledge of bird-habitat associations and professional judgement and experience in the assessment of impacts upon ornithological features, as a result of similar developments.

7.19 The following surveys were undertaken:

- Vantage Point (VP) flight activity surveys (March 2021 to February 2022);
- Breeding bird survey (April 2021 to June 2021); and,
- Winter walkover surveys (September 2021 to March 2022).

7.20 Target species were identified with reference to NatureScot guidance[57,58] and have included those which are afforded a higher level of legislative protection in Wales and which are potentially sensitive to wind farm developments.

7.21 The location of the VP is shown in **Figure 8** in **Appendix A**.

7.22 Species were therefore drawn from the following lists:

- Annex I of the EC Birds Directive;
- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- Red-listed Birds of Conservation Concern (Stanbury *et al*., 2021)[68]; and,
- Welsh Government list of habitats and species of principal importance in Wales (known as the Section 7 lists).

7.23 This has therefore broadly included all Annex 1 and Schedule 1 raptors and owls, all waders and waterfowl (excl. mallard *Anas platyrhynchos* and feral species) and additional qualifying interests of relevant statutory designated sites listed in **Table 7.1**.

7.24 Secondary species for the recording of incidental observations, have included all gulls, commoner raptors (incl. buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*) and mallard.

7.25 Study areas for survey were adopted in accordance with NatureScot guidance[57] and were defined as follows:

- VP Flight Activity Surveys; 500m buffer around proposed turbine locations, with a single VP location used to provide maximum visual coverage;
- Breeding Bird Survey Area; 500m buffer around proposed turbine locations, extended to include all areas of the Site, as access permissions allowed; and,
- Winter Walkover Survey Area; 500m buffer around proposed turbine locations, extended to include all areas of the Site, as access permissions allowed.

7.26 All surveys were undertaken in accordance with methodologies and species-specific survey advice detailed in NatureScot guidance[6] and were undertaken by suitably qualified and competent ornithological surveyors.

7.27 Further details of survey methodologies and survey areas is presented in **Appendix D3**. Full details will be provided within the Ecology Chapter of the ES and associated Technical Appendices.

Baseline Survey and Desk Study Results

7.28 At the time of writing, baseline ornithological surveys conducted by Avian Ecology Ltd. have not yet concluded. As such, full details of

[68] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.

baseline surveys will be presented within the Ornithology Chapter of the ES and associated Technical Appendices.

Statutory and Non-Statutory Designated Sites for Nature Conservation

7.29 **Figures 6a and 6b** in **Appendix A** and **Table 7.1** identifies statutory designated sites with ornithological interests located within 5km of the Site, extended to 10 km for internationally important designations of the Site.

7.30 The Site does not form part of any statutory designated site for nature conservation with ornithological interests. The nearest such designation comprises the Milford Haven Waterway SSSI located adjacent to the south of the Site.

7.31 There are no non-statutory designated sites within 2km of the Site.

Table 7.1 Statutory designated sites with ornithological interest

Site	Distance and Direction	Ornithological Qualifying Interests
Milford Haven Waterway SSSI[69]	Adjacent to Site	The designation is noted for its significant number of over-wintering wildfowl and waders, with species of special interest including little grebe *Tachybaptus ruficollis,* shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca*, dunlin *Calidris alpina* and curlew *Numenius arquata*.
Castlemartin Coast SPA[70]	4.75km south west	Chough Pyrrhocorax pyrrhocorax
Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA[71]	13km west	Storm petrel Hydrobates pelagicus Chough Short-eared owl Asio flammeus Manx shearwater Puffinus puffinus Puffin Fratercula arctica Lesser Black-backed gull Larus fuscus Seabird assemblage

Additional Existing Records of Protected and Notable Bird Species

7.32 WWBIC returned numerous records of 16 protected and notable bird species from the last 5 years from within 2km of the Site. Of these, 5 were listed on Section 7 of the Environment Act (Wales) 2016, 1 was listed on Schedule 1 of the The Wildlife and Countryside Act

69 https://naturalresources.wales/media/639589/SSSI_0282_Citation_EN0010ded.pdf [Accessed 22/03/2022].
70 https://naturalresources.wales/media/632535/SPA_UK9014061_Register_Entry_EN001.pdf [Accessed 22/03/2022]
71 https://naturalresources.wales/media/691745/spa_uk9014051_register_entry.pdf [Accessed 22/03/2022]

1981 (as amended) and 1 was red listed in "Birds of Conservation Concern 5"[72].

VP Flight Activity Surveys

7.33 Two years of VP Flight Activity Surveys, within the most recent five year period have been collected to inform the design and assessment of the Proposed Development:

- BSG Ecology September 2017 to August 2018 comprising 72 observational hours from 2 VPs; and,
- Avian Ecology Ltd. March 2021 to February 2022 comprising 72 observational hours from 1 VP.

7.34 Both years of survey have provided adequate coverage of the required VP study area in accordance with current industry guidance[57], to allow for an assessment of potential collision risks to key species.

7.35 A summary of key findings is presented below.

BSG Ecology September 2017 to August 2018 (Year 1)

7.36 Target species recorded during VP flight activity surveys between September 2017 and August 2018 included shelduck, peregrine *Falco peregrinus*, merlin *Falco columbarius*, oystercatcher *Haematopus ostralegus*, golden plover *Pluvialis apricaria*, lapwing *Vanellus vanellus*, curlew, snipe *Gallinago gallinago*, little egret *Egretta garzetta*, and red kite *Milvus milvus*.

7.37 Overall flight activity for all target species was considered to be very low, generally comprising one or two flights per survey.

7.38 Activity for notable secondary species, including herring gull *Larus argentatus*, lesser black-backed gull *Larus fuscus*, great black-backed gull *Larus marinus*, common gull *Larus canus*, Mediterranean gull *Ichthyaetus melanocephalus* and black-headed gull *Chroicocephalus ridibundus*, primarily occurred over the Milford Haven Waterway, beyond the VP study area. Comparatively infrequent flights were recorded over the Site, suggesting the absence of any regularly used or important flyway for these species.

Avian Ecology March 2021 to February 2022 (Year 2)

7.39 Target species recorded during VP flight activity surveys between March 2021 and February 2022 included great northern diver *Gavia*

[72] Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds 114: 723-747.

immer, fulmar *Procellaria glacialis*, gannet *Morus capensis*, red kite and great skua *Stercorarius skua*.

7.40 Overall flight activity for all target species was very low, limited to single flights of each species over the entire survey effort.

7.41 Activity of notable secondary species, similarly included black-headed gull, common gull, herring gull, lesser black-backed gull and great black-backed gull, with low levels of flight activity recorded.

Peregrine Scoping Survey 2018

7.42 The results of the Peregrine Scoping Survey divulge specific details in relation to a protected species and therefore are not presented in this document. However, the results are presented in the confidential BSG Wear Point Wind Farm Extension, Baseline Ecological Report 2017-2019[23] found in **Appendix D4**.

7.43 In conclusion, two years of VP flight activity data has been collected within the most recent five-year period and has provided adequate visual coverage of the proposed turbine locations, within which to record potential "at collision risk" flight activity of target species in accordance with current industry guidance."

Breeding Bird Survey

7.44 During survey in 2021 the breeding bird survey area was found to support a narrow assemblage of lowland breeding passerines, typical of the locale and habitats present.

7.45 All species recorded are generally widespread, with only a small number of territories recorded.

7.46 Passerine species are not generally considered to be susceptible to the impacts of wind farms.

7.47 Full details of the breeding bird assemblage recorded is presented in **Appendix D3**.

Winter Walkover Surveys

7.48 At the time of writing, winter walkover surveys had not yet concluded. As such, full details of baseline surveys are not presented in this document and will be presented within the Ornithology Chapter of the ES and associated Technical Appendices.

7.49 Preliminary results show a small number of waders (including curlew, woodcock *Scolopax rusticola*, jacksnipe *Lymnocryptes minimus* and snipe) and gulls (including common gull, herring gull, great black-backed gull and lesser black-backed gull) recorded during these surveys with no waterfowl recorded.

Additional Surveys

7.50 In the absence of statutory guidance published by NRW with regard to the assessment of wind farm developments in Wales, baseline information gathering with regards to the Proposed Development has been undertaken with reference to industry guidance from NatureScot[57,58,59,73].

7.51 NatureScot guidance advises that a minimum of two years of ornithological surveys should be undertaken to inform the design and assessment of onshore wind farm developments, unless it can be demonstrated that a shorter period of survey is sufficient. This includes instances where adequate site-specific information, up to five years old, exists and/or where a site supports lower bird interest or bird activity levels.

7.52 Baseline ornithological surveys undertaken to inform the design and assessment of the Proposed Development, together with studies undertaken to inform a previous iteration of the Proposed Development are considered to provide a comprehensive and contemporary account of Target Species activity within the Site and surrounding area.

7.53 All surveys have been undertaken in accordance with current industry guidance[56] and by suitably competent and experienced field surveyors.

7.54 Two years of VP flight activity data has been collected within the most recent five-year period and has provided adequate visual coverage of the proposed turbine locations, within which to record potential "at collision risk" flight activity of target species. Surveys have illustrated that very low levels of Target Species flight activity occur over the proposed turbine locations and wider Site.

7.55 Breeding bird interests within the Site is also low, limited to a small number of passerines, primarily associated with hedgerow and scrub habitats.

7.56 Habitats within the Site were found to be of low importance to wintering species such as waders and waterfowl. Species recorded during winter walkover surveys to date have included curlew, woodcock, jacksnipe, snipe, herring gull, greater black-backed gull, common gull and lesser black-backed gull. With the exception of snipe and common gull, all species have been recorded infrequently and in low numbers (single birds) within the Site. Snipe and common gull were the most frequently recorded species, with peak counts of 35 and 50 birds recorded respectively. Suitable habitats for these species are however, considered extensive locally, with

[73] SNH, 2016 - Assessing Connectivity with Special Protection Areas (SPAs) https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf [Accessed 22/03/2022]

more attractive foraging and roosting opportunities provided within the Milford Haven Waterway to the south of the Site.

7.57 At the time of writing, winter walkover surveys had not yet concluded. However, preliminary results analysis show a small number of waders and gulls recorded during these surveys with no waterfowl recorded.

7.58 Full details of baseline surveys will be presented within the Ornithology Chapter of the ES and associated Technical Appendices.

7.59 In view of two full years of VP flight activity and habitats within the Site providing low interests to species potentially sensitive to wind farm developments in accordance with current industry guidance[57], no further surveys are proposed.

Impact Assessment Methodology

7.60 Full details of baseline studies and consultations will be provided within the Ornithology Chapter of the ES.

7.61 The Ornithology Chapter will be supported by Technical Appendices and relevant figures, which will provide full details of desk studies, consultations and field surveys undertaken to inform the design and assessment of the Proposed Development.

7.62 The Ornithology Chapter will provide a detailed description of the existing baseline ornithological features of the Study area, along with the assessment of the potential impacts of the Proposed Development on the identified important ornithological features.

7.63 The approach to assessment will take account of existing guidance and published scientific literature in relation to birds and windfarms, together with professional judgement and experience of wind farm EIA.

7.64 Impact assessment presented within the Ornithology Chapter for ornithological features will be based on current Chartered Institute of Ecological and Environmental Management (CIEEM) guidance[74] and NatureScot guidance[56,57,58,72].

7.65 The assessment process will include the following stages:

- determination and evaluation of important ornithological features;
- identification and characterisation of impacts;

[74] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine. https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf [Accessed 22/03/2022]

- outlining mitigation measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures;
- identification of appropriate compensation measures to offset significant residual effects; and,
- identification of opportunities for ornithological enhancement.

Determining Importance

7.66 The Ornithology Chapter will only assess in detail impacts upon important ornithological features, which are likely to be significantly affected by the Proposed Development. A detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts will not be undertaken and justification for "scoping out" provided within the Ornithology Chapter.

7.67 Relevant European, national and local legislation policy and guidance will be referred to in order to determine the importance (or 'sensitivity') of ornithological features. In addition, importance will also be determined using professional judgement, specialist consultation advice and the results of baseline surveys and the importance of features within the context of the geographical area.

7.68 Important ornithological features may include:

- species listed on Annex 1 of the Birds Directive;
- species listed on Schedule 1 of the Wildlife and Countryside Act; and,
- 'Priority bird species for assessment when considering the development of onshore wind farms in Scotland' as listed on Annex 1 of NatureScot guidance[57].

7.69 Importance will not necessarily relate solely to the level of legal protection that a feature receives and ornithological features may be important for a variety of reasons, such as their connectivity to a designated site and the rarity of species or the geographical location of species relative to their known range.

7.70 For the purposes of this assessment the importance or sensitivity of an ornithological feature is considered within the context of a defined geographical area, ranging from International (high value) to Site (low/negligible), as detailed in **Table 7.2**.

Table 7.2 Importance/sensitivity and geographic scale of ornithological feature

Geographic scale of importance	Definition
High - International	Beyond a UK scale, e.g. internationally designated site (SPA and/ or Ramsar site) or proposed/ candidate site (pSPA), A regularly occurring species present in internationally important numbers (>1% of its biogeographical population) listed under Annex I of the Birds Directive, or regularly occurring migratory species listed under Annex II of the Birds Directive, connected to an internally designated site for the species.
High - National	A nationally designated site (e.g., SSSI) or a discrete area which meets the selection criteria for national designation. A regularly occurring species present in nationally important numbers (>1 % of its Welsh population) and listed as a UK BAP species, Welsh Government list of habitats and species of principal importance in Wales (known as the Section 7 lists), Red-listed bird of Conservation Concern and listed under Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Medium – Regional/County	Pembrokeshire: A regularly occurring species present in regionally important numbers i.e., >1 % of its regional population and listed as a UK BAP species, Section 7 species, Red-listed birds of Conservation Concern or listed on Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Low - Local	Waterston: All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which do contribute to the local breeding/wintering bird assemblage.
Negligible - Site	Considered within the context of the Site only.

7.71 Effects on ornithological receptors will be assessed based upon the interaction between their importance or sensitivity and the nature of the change likely to be experienced in relation to environmental parameters as set out in **Table 7.3**.

7.72 Once identified, potential impacts will be described making reference to the following characteristics as appropriate: positive or negative, extent, magnitude, duration, timing, frequency, and, reversibility. The judgements on magnitude may need to be adjusted (either up or down) to reflect the duration of the change (i.e., short, medium or long term) and whether it is potentially reversible. The assessment will also identify areas where no change is anticipated and the resulting effect is described as 'not discernible' or 'none'.

7.73 Ornithological effects will describe as far as possible and where available information allows in terms of the parameters detailed in **Table 7.3** below. Limitations will be acknowledged where relevant and precautionary parameters will be used where appropriate, for avoidance of doubt.

Table 7.3 Environmental parameters

Environmental Parameter	Description
Magnitude	The 'size' or amount of the effect is referred to as the magnitude and is determined on a quantitative basis where possible supported by professional judgement.
Extent	The area over which an effect occurs. The magnitude and extent of an effect may be synonymous
Duration	The time over which an activity or impact is expected to last and associated effect prior to the recovery or replacement of the ornithological receptor. This can be considered in terms of life cycles of species or regeneration of habitats. The duration of effect may be longer than the duration of an activity.
Reversibility	Reversible (or temporary) effects are those that occur during the lifetime of the development and where spontaneous recovery or mitigation allows recovery within a reasonable timescale. Permanent effects are those which cannot be recreated within the Proposed Development or there is no reasonable chance that actions can be undertaken to reverse it.
Timing and Frequency	The timing of effects in relation to important seasonal and/or life cycle constraints. The frequency with which activities and simultaneous effects would take place can be an important determinant.

7.74 Magnitude of effect will be assessed based on the effects that the Proposed Development would have upon the resource/receptor, within the range of high, medium, low, negligible, detailed in **Table 7.4**.

Table 7.4 Magnitude of impact/change

Magnitude	Criteria
High	The change may negatively or positively affect the conservation status of a site or species population, in terms of the coherence of its ecological structure and function that sustains the habitat, complex of habitats and/or the population levels of species of interest.
Moderate	Conservation status of a site or species population will not be negatively or positively affected, but some element of the functioning of the site or population might be affected and the change to the site/ population is likely to be significant in terms of its ability to sustain some part of itself in the long term.
Low	Neither of the above applies, but some minor negative or positive change is evident on a temporary basis, or the change affects extent of habitat or individuals of a species abundant in the local area.
Negligible	No observable effect in either direction

Identification and Characterisation of Impacts

7.75 The identification and characterisation of impacts on important ornithological features will be undertaken in accordance with the

CIEEM guidelines[75] with reference made to magnitude (e.g., area or number of individuals to be impacted), extent, duration and reversibility, as appropriate.

7.76 Impacts will be considered during the construction, operational and decommissioning phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures are implemented.

Significant Effects

7.77 Ecological Impact Assessment is defined within the CIEEM guidelines as:

'…a process of identifying, quantifying and evaluating the potential effects of development-related or other proposed actions on habitats, species and ecosystems'.

7.78 The EIA Regulations (Wales) require the description of the 'likely significant environmental effects of the Proposed Development on the environment' (Regulation 17(3)(b)).

7.79 The assessment considers effects at different geographic scales i.e., where effects may be discernible at a local scale but are not considered significant in the context of the EIA Regulations. For the purpose of the assessment, moderate and substantial effects are deemed to be 'significant' in EIA terms unless stated otherwise.

7.80 CIEEM guidelines[75] define a 'significant effect' as an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general (i.e., the feature could be positively or negatively significantly affected).

7.81 CIEEM guidelines[7551] on ecological impact assessment note that:

"A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures as long as the mitigation hierarchy has been applied effectively as part of the decision-making process."

7.82 For the purposes of assessment, the significance of effects will primarily be expressed within the Ornithology Chapter with reference to the regional, national or international scale (as relevant). The significance of effects at a local scale may also be assessed where sufficient information allows a meaningful assessment.

7.83 The assessment of effects will be undertaken taking into consideration collated field survey information and information available from the desk study. Target species flight activity data will

be collated and reviewed and where sufficient, analysed to assess the potential risk to individual species of conservation concern from collision mortality, following the method described by Band *et al.* (2007)[75].

7.84 In order to assess significance, population information will be collated on relevant regional and national scales, where available.

7.85 In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect will be assumed as a precautionary approach. Where uncertainty exists, this will be acknowledged in the Ornithology Chapter.

7.86 For ease of reference, **Table 7.5** below sets out adapted CIEEM terminology, which also shows the equivalent EIA terms.

Table 7.5 EIA regulations and CIEEM terminology used

Effect (standard EIA-related terminology and associated assigned significance)		**Equivalent CIEEM terminology adapted for Ecological Assessment**
Moderate or Substantial Beneficial	Significant	Positive effect on ecological integrity or conservation status at a County, National or International geographic scale
Minor Beneficial	Not Significant	Positive effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only
Negligible and Neutral	Not Significant or Neutral	No discernible or significant effect on ecological integrity or conservation status (e.g., species or habitat).
Minor Adverse	Not Significant	Adverse effect on ecological integrity or conservation status, discernible/significant in ecological terms at a Local geographic scale only.
Moderate or-Substantial Adverse	Significant	Adverse effect on ecological integrity or conservation status at a County, National or International geographic scale.
Moderate or Substantial Beneficial	Significant	Positive effect on ecological integrity or conservation status at a County, National or International geographic scale

Duration of Effects

7.87 Development-related activities and their associated impacts have been described in terms of their predicted duration as short, medium term and long-term as follows, recognising that the actual duration of effects may be different for different species:

- Short-term: defined as 0 - 3 years;
- Medium term: defined as 3 - 15 years; and,

[75] Band, W., M. Madders, and D. P. Whitfield. (2007). Developing field and analytical methods to assess avian collision risk at wind farms. Pages 259–275 in M. de Lucas, G. F. E. Janss, and M. Ferrer, editors. Birds and wind farms: risk assessment and mitigation. Quercus, Madrid, Spain.

- Long term: defined as > 15 years.

Cumulative Assessment

7.88 Cumulative impacts will be assessed with reference to NatureScot guidance[57,76]) for all important ornithological features subject to a detailed assessment. The potential for significant cumulative effects due to habitat loss, disturbance/displacement and collision risk mortality will be assessed. The assessment will be based on the consideration of residual effects i.e., assuming that proposed mitigation and compensation measures (where relevant) are implemented.

7.89 The cumulative assessment will include consideration of the following developments located within 10km of the Site:

- existing wind farm developments, either built or under construction;
- approved wind farm developments, awaiting implementation; and,
- wind farm proposals awaiting determination within the planning process with design information in the public domain.

Future baseline

7.90 The future baseline includes any natural changes expected to occur during the lifetime of the Proposed Development and the continued existence and operation of developments such as the Dragon LNG terminal and the wind turbines in the surrounding area. This future baseline is the basis for the assessment in the Ornithology Chapter.

7.91 For this Site a key consideration is the co-located solar farm (PCC application reference 21/0986/PA). As it is expected that the Dragon LNG Solar Farm will be built and operational by the time the Proposed Development is built, it is considered to form part of the future baseline for the Ornithology Chapter.

Presentation of Sensitive Information

7.92 Any sensitive data (e.g., breeding raptor locations) will be included in a confidential appendix to the Ornithology Chapter which will not be made publicly available but will be issued to Planning and Environment Decisions Wales (PEDW).

Approach to Mitigation

7.93 The adoption of embedded mitigation measures to avoid or minimise adverse impacts upon ornithological features resulting

[76] SNH (2018) Assessing the cumulative impact of onshore wind energy developments. Guidance. March 2012. https://www.nature.scot/doc/guidance-assessing-cumulative-impacts-onshore-wind-farms-birds [Accessed 22/03/2022]

from the Proposed Development is part of the iterative design process of the Proposed Development.

7.94 Full details of the scheme design evolution and embedded mitigation measures in relation to ornithology will be detailed within the Ornithology Chapter. This may include the specification of any species-specific working buffers and/or restrictions on the timing of construction works, as necessary to ensure legislative compliance following the completion of baseline studies outlined.

Residual Effects

7.95 Where the EIA proposes measures to mitigate potentially significant adverse effects on ornithological features, a further assessment of residual ornithological effects, taking into account any mitigation recommended, will be undertaken.

Enhancement

7.96 Suitable principles for biodiversity enhancement which may be delivered as part of the Proposed Development will be outlined within the Ornithology Chapter of the ES, with view to prescriptive enhancement measures agreed post-consent in consultation with key consultees, and detailed within a Habitat Management Plan (HMP) or similar.

Potential Impacts

7.97 Potential adverse impacts upon ornithological features as a result of onshore wind farm developments may arise from direct habitat loss, displacement (indirect habitat loss), and mortality resulting from collision or interaction with development infrastructure.

7.98 Such effects will be assessed for the construction, operational and decommissioning phase of the Proposed Development, and in combination with other developments.

Construction Phase

7.99 During the construction of the Proposed Development, in the absence of mitigation, impacts upon ornithological features may arise from:

- habitat loss, fragmentation or change as a result of the delivery and installation of development infrastructure; and,
- disturbance to and loss of nest sites, eggs and/or dependent young.

7.100 Direct habitat losses have the potential to result in the loss or otherwise lowered quality of nesting and foraging opportunities for ornithological features which are known to use habitats within the

Site. Overall direct and permanent habitat losses within the Site, on the basis of the nature and scale of the Proposed Development will be small, with suitable habitats for ornithological features remaining abundant within the Site and the immediate and wider surrounding area.

7.101 Construction activities will likely result in a temporary increase in noise, vibration and human presence within construction areas of the Site. This has the potential to displace birds from the vicinity of construction areas for the duration of construction works. The extent of displacement is considerably variable between species and sites and will be discussed in relation to Target Species, including those associated with relevant designated sites for nature conservation within the Ornithology Chapter of the ES.

7.102 Overall construction disturbance would be considered temporary and would occur only when construction activities are taking place.

Operation

7.103 The operation of turbines and maintenance activities has the potential to cause disturbance and displacement of birds over the operational lifetime of the Proposed Development. The extent of displacement is however, highly variable between species and therefore a species-specific assessment of potential displacement effects will take place on the basis of baseline study findings.

7.104 Given the location of the Proposed Development adjacent to an existing industrialised area, the use of the Site and immediate surrounding area are likely to be currently influenced by the nature and occurrence of existing disturbances.

7.105 Additionally, the attractiveness of habitats within the Site for ornithological interests following the construction and operation of the Dragon LNG Solar Farm will be reduced.

7.106 The risk of avian mortality resulting from the collision of birds with the turbine blades is also acknowledged to be higher for some species due to their biometrics and flight behaviour. The likelihood of collision is also likely to be influenced by the type of habitats within the Site and the surrounding area.

7.107 Where flight activity data is sufficiently recorded, an assessment of annual collision risk can be made following the Band Model[75] in accordance with NatureScot guidance[76,77], to quantify the likelihood of mortality for Target Species.

7.108 "At collision risk" flight activity is defined for the Proposed Development, in accordance with NatureScot guidance[77], as flight

[77] SNH (2000) Windfarms and Birds - Calculating a theoretical collision risk assuming no avoiding action. SNH Guidance Note. Available at http://www.snh.gov.uk/docs/C205425.pdf.

activity recorded at Collision Risk Height (between 15 and 150m) and within 200m of proposed turbine locations. This adopts a precautionary approach on the basis of the proposed turbine specification.

7.109 Flight activity of Target Species recorded within proximity to turbines and over the Site during VP Flight Activity Surveys, is considered to have been consistently low over both survey years. Very few target species within the BSG Ecology and Avian Ecology Ltd. datasets had more than four flights "at collision risk" in any survey year, none of which comprised large flocks and all of which comprised single individuals. As such, annual collision risk mortality, in the absence of detailed analysis, can reasonably be predicted to be very small and inconsequential at any population level over the lifetime of the Proposed Development.

7.110 BSG Ecology undertook a review of the potential impacts of photo-voltaic (PV) solar arrays on birds. From the body of research reviewed by BSG it was concluded that the majority of concerns surrounding the impact of PV solar panels on birds are not supported by enough relevant research in comparable situations to be considered a real threat to local bird populations.

7.111 As such, following the construction of the Dragon LNG Solar Farm, baseline flight activity levels would likely remain consistent.

Decommissioning

7.112 Potential impacts associated with the decommissioning phase are likely to be similar to those identified for the construction phase.

Scoped Out for Further Assessment

7.113 The above scope is based on the requirement for EIA to consider likely significant effects of the Proposed Development. Effects that are not likely to be significant do not require assessing under the EIA regulations and may be scoped out of detailed assessment within the ES.

7.114 Direct habitat losses as a result of the Proposed Development have been inherently minimised through sensitive scheme design. Such losses, whilst permanent, will reasonably be very small, resulting in no more than local level effects upon ornithological features. The effects of direct habitat losses will therefore be scoped out of detailed assessment, within the ES, as such effects would not be significant for any species.

7.115 Impacts of the Proposed Development on passerine species known to use habitats within the Site, as recorded during breeding bird surveys, will not be subject to a detailed assessment within the ES. As stipulated in current industry guidance[57], it is generally accepted

that passerine species are not significantly impacted by onshore wind farm developments.

7.116 However, mitigation measures to ensure legislative compliance with regards to the protection of all wild birds, their nests and eggs, under the provisions of the Wildlife and Countryside Act 1981 (as amended), will be outlined within the ES for inclusion within a CEMP for the Proposed Development (an indicative contents list for the CEMP can be found at **Figure 11**, **Appendix A)**.

7.117 On the basis of VP flight activity data, collision risks to Target Species as a result of the operation of the Proposed Development is reasonably considered to be very small. Detailed quantitative collision risk analysis, in accordance with NatureScot guidance[78], is therefore not proposed for any Target Species as part of the assessment.

7.118 Baseline studies, including extensive site-specific surveys, have not identified the use of the Site and immediate surrounding area by chough. Populations and breeding pairs are considered to be generally restricted to the designation area of the Castlemartin Coast SPA approximately 4.75km to the south west of the Site and Skomer, Skokholme and the Seas off Pembrokeshire SPA, approximately 13km west of the Site. The likelihood of chough occurring within the Site is therefore considered to be extremely low, and as such no effects upon the species or the integrity of the designated site are likely to occur.

7.119 Additional qualifying interests of the Skomer, Skokholm and the Seas off Pembrokeshire SPA (see **Table 7.1**) are primarily associated with the marine and nearshore environment, with the terrestrial habitats of the Site providing no foraging and/or nesting habitat interest for these species. No observations have been made of storm petrel, short-eared owl, Manx shearwater or puffin during baseline surveys. Activity of lesser black-backed gull primarily occurred over the Millford Haven Waterway to the south of the Site. Significant effects upon qualifying interest species of the Skomer, Skokholm and the seas off Pembrokeshire SPA and impacts upon the integrity of the designation, are therefore not likely to occur.

7.120 With the exception of the Milford Haven Waterway SSSI, based on the distances from the Site, and the features for which they are designated, it is therefore considered that no connectivity exists between the Site and any other statutory designated site for nature conservation with ornithological interests. Impacts upon the Castlemartin Coast and Skomer and Skokholm and the Seas off Pembrokeshire SPA are therefore proposed to be scoped out of the assessment, and a Habitats Regulations Assessment (HRA) of the

[78] SNH Guidance Note. Available at http://www.snh.gov.uk/docs/C205425.pdf.

Proposed Development upon these sites is not considered to be required.

7.121 The potential for significant adverse effects upon any other such site is therefore discounted and scoped out of assessment.

Key Questions for Consultees

7.122 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q7.1: Do consultees agree that in the absence of industry guidance published by NRW for Wales, that reference to current NatureScot guidance is the correct guidance to refer to?
- Q7.2: Do consultees agree with the list of Target Species used to inform the scope of baseline surveys completed?
- Q7.3: Do consultees agree with the scope and methodologies of baseline surveys undertaken to inform the design and assessment of the Proposed Development?
- Q7.4: Do consultees agree that the number, range, timing and duration of surveys carried out to date for VPs is sufficient and appropriate to inform the design and assessment of the Proposed Development?
- Q7.5: Are there any other existing sources of ornithological information consultees consider should be reviewed to inform the possible requirement for further survey and/or impact assessment?
- Q7.6: Do consultees agree that no further baseline surveys are required to inform the design and assessment of the Proposed Development?
- Q7.7: Do consultees agree with the proposed approach to impact assessment methodology outlined, including determination of importance and identification of significant effects?
- Q7.8: Do consultees agree that a detailed assessment of direct habitat loss impacts upon ornithological features, is not required?
- Q7.9: Do consultees agree that a detailed assessment of impacts upon passerine species as a result of the Proposed Development, is not required?
- Q7.10: Do consultees agree that quantitative analysis of potential collision risks (collision risk analysis) is not required for any target species? If not, specifically which species for this is required and at which population level should mortality be considered?

- Q7.11: Do consultees agree that with the exception of the Milford Haven Waterway SSSI, potentially significant adverse effects upon any other statutory designated sites for nature conservation with ornithological interests can be precluded. Specifically, do consultees agree that a Habitats Regulations Assessment (HRA) of the Proposed Development upon the Castlemartin SPA and Skomer, Skokholm and the Seas off Pembrokeshire SPA, is not required?
- Q7.12: Are there any specific non-wind energy developments that consultees consider should be considered for inclusion within the cumulative impact assessment?

8. HISTORIC ENVIRONMENT – SCOPED IN

8.1 This section presents the proposed scope of work for assessment of likely significant effects of the Proposed Development upon archaeology and cultural heritage (collectively termed the 'historic environment').

8.2 A historic asset is defined as "a building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest." Some historic assets are designated, such as Registered Historic Landscapes, Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas and Registered Historic Parks and Gardens or else are locally designated through policies in the Local Plan. Non-designated assets may be recorded in Historic Environment Records, while many other assets are currently unrecorded. Historic assets may also derive some, or all, of that interest from their 'setting' within the wider landscape.

8.3 The purpose of the assessment will be 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.

8.4 The Historic Environment section of the Environmental Statement (ES) will characterise the historic environment within the site and in the wider study area. It will use the results of consultation, desk-based research, walkover surveys and setting visits to define a study area and to assemble a baseline of heritage assets within it, and then to assess the potential effects of the Proposed Development on that baseline. Where potential effects are identified, mitigation measures will be suggested.

8.5 Although effects upon the significance of historic assets as a result of change within their setting are likely to be primarily visual in nature, the assessment of these visual effects is distinct from the assessment of visual change in the LVIA. The assessment of effects on setting may be informed by visualisations prepared as part of the LVIA but the conclusions reached regarding visual change in the setting of a historic asset are distinct.

Current Baseline Knowledge

8.6 In terms of potential direct (physical) impacts within the Site boundary, a previous application for a proposed solar farm on the Site included a desk-based assessment and geophysical survey. The previous surveys indicate that there is little of archaeological interest within the Site boundary, in terms of either known or potential archaeological remains.

8.7 In terms of potential setting effects in the wider study area, **Figure 9, Appendix A** shows the location of designated historic assets located within 5km of the Site, which are also summarised below.

8.8 The Site lies within the Milford Haven Waterway Registered Landscape of Outstanding Historic Importance. As such an ASIDOHL2 assessment will be required to support the EIA and ES (see section below).

8.9 There are two Historic Parks and Gardens within 5km of the Site: Castle Hall landscape garden and pleasure grounds is located just over 1km to the north west; and Great Harmeston, a small enclosed garden associated with a gentry home, is located 4km to the north.

8.10 There are 22 Scheduled Monuments within 5 km of the Site, presented in **Table 8.1**.

Table 8.1: Scheduled Monuments within 5 km of the Site

Scheduled Monument Number	Scheduled Monument Name	Approximate Distance and Direction
PE332	South West Dockyard Tower	3.1km SE
PE223	Rosemarket Rath	4.2km NE
PE135	Long Stone Burial Chamber	4.1km NW
PE064	Wallaston Round Barrows	4.3km S
PE541	Castle Pill	1.7km NW
PE187	Thornton Rath	3.7km NW
PE264	West Popton Camp	2.1km SW
PE339	Fort Scoveston	2.6km NE
PE400	Enclosure & Earthworks at Lewiston Hall	1.8km S
PE446	Fort Popton (Curtain Walls and Gun Emplacements only)	3.3km SW
PE186	Priory Rath	3km NW
PE262	West Pennar Camp	1.9km SE
PE572	Jordanston Farm Promontory Fort	3.9km NE
PE570	Bomb stores at West end of Fort Road	3.2km SE
PE380	Paterchurch Tower, Pembroke Dock	3.4km SE
PE379	Defensible Barracks, Pembroke Dock	3.8km SE
PE070	Pill Priory	3.4km NW

Scheduled Monument Number	Scheduled Monument Name	Approximate Distance and Direction
PE387	Hakin Observatory	3.5km NW
PE263	Eastington Manor House	3.4km SW
PE224	Rosemarket Dovecot	4.4km NE
PE452	American War of Independence Redan at Bath House	3.9km E
PE338	Fort Hubberston	3.6km W

8.11 There are four Grade I Listed Buildings, 25 Grade II* Listed Buildings and 239 Grade II Listed Buildings within 5 km of the Site. **Table 8.2** presents the Grade I Listed Buildings.

Table 8.2: Grade I Listed Buildings with 5 km of the Site

Historic Building Number	Listed Building name	Grade	Approximate Distance and Direction
12925	Church of St David	I	3.9km NW
6594	The Tower at Eastington Manor House	I	3.3km SW
6591	Church of St Decumanus	I	3.3km SW
14341	Paterchurch Tower	I	3.4km SE

8.12 South of Milford Haven there have been several previous applications for a wind farm at Rhoscrowther, for which the main heritage constraint has been the grade II listed St Decumanus Church, Rhoscrowther.

Potential Impacts

8.13 Effects on the historic environment can arise through direct physical impacts, impacts on setting or indirect impacts.

8.14 Direct physical impacts describe those development activities that directly cause damage to the fabric of a historic asset. Typically, these activities are related to construction works and will only occur within the Proposed Development site boundary of the asset.

8.15 An impact can occur within the setting of a historic asset when the presence of a development changes its surroundings in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual impacts are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Impacts may be encountered at all

stages in the life cycle of a development from construction to decommissioning but they are only likely to lead to significant effects during the prolonged period which is the operational life of the development.

8.16 Indirect impacts describe secondary processes, triggered by the development, that lead to the degradation or preservation of historic assets. For example, changes to hydrology may affect archaeological preservation; or changes to the setting of a building may affect the viability of its current use and thus lead to dereliction.

8.17 Decommissioning should not result in further damage to historic assets as the ground disturbance would already have occurred during the construction phase, and therefore is scoped out of the assessment.

8.18 Cultural heritage constraint areas will, where necessary, be defined to include an appropriate buffer around known historic assets. Constraint areas can be treated as a 'trigger' for the identification of potential direct effects: they represent areas within which works may lead to direct effects of more than negligible significance on known historic assets.

8.19 Potential effects on unknown historic assets will be discussed in terms of the risk that a significant effect could occur. The level of risk depends on the level of archaeological potential combined with the nature and scale of disturbance associated with construction activities and may vary between high and negligible for different elements or activities associated with a development, or for the Proposed Development as a whole.

8.20 Potential effects on the settings of historic assets will be identified from an initial appraisal ('stage 1 settings assessment') of data from Cadw, RCAHMW and the Dyfed Archaeological Trust (DAT) Historic Environment Record (HER), along with consideration of previous assessments, current maps and available aerial images. Where this initial appraisal identifies the potential for a significant effect, the asset will be visited to define baseline conditions and identify key viewpoints. Visualisations will be prepared (by the LVIA consultants) to illustrate changes to key views where potentially significant effects are identified.

8.21 Where potentially significant effects are identified, mitigation measures will be proposed. The preferred mitigation option is always to avoid or reduce effects through design, or through precautionary measures such as fencing off historic assets during construction works. Effects which cannot be eliminated in these ways would lead to residual effects.

Methodology

8.22 The first stage of the planned work will involve establishing the historic environment baseline of the project area. This will inform the impact assessment, involving an assessment of likely significant effects to the historic environment, comprising direct, setting and indirect effects.

8.23 Subject to the outcome of the scoping and initial consultation process, the methodology is detailed below.

Consultation

8.24 Relevant cultural heritage bodies will be consulted directly regarding the Proposed Development and its impacts. Consultees will include:

- **Cadw**: in relation to impacts on heritage assets of national importance, including Scheduled monuments, Listed Buildings, Registered Parks and Gardens and registered historic landscapes.
- **Dyfed Archaeological Trust (DAT)**, as advisors to the local planning authority: in relation to potential physical impacts on potential sub-surface remains within the application site and whether further evaluation will be required (the site has already been subject to a geophysical survey in advance of the solar farm); and in relation to setting impacts upon historic assets. DAT would also be approached to agree the scope of the archaeological assessment, including the proposed sources of information and the extent of the study area.
- **LPA Conservation Officer**: in relation to setting effects upon Listed Buildings and Conservation Areas.

Guidance

8.25 Impacts will be assessed with reference to relevant legislation, National Planning Policy and Guidance, and Regional and Local Planning Policy relating to Cultural Heritage. The assessment will be carried out with reference to the following legislation, policy and guidance:

- The Historic Environment (Wales) Act 2016 as the primary statutory tool for protecting historic assets and sustainable management of the historic environment in Wales
- Planning Policy Wales Edition 11, February 2021 (PPW)
- Technical Advice Note 24: The Historic Environment (May 2017)
- Cadw guidance documents: Heritage Impact Assessment in Wales (May 2017), Managing Change to Listed Buildings (2017), Managing Change to Registered Parks and Gardens (2017) and the Setting of Historic Assets in Wales (2017)

- Cadw/CCW/WG's Guide To Good Practice On Using The Register Of Landscapes Of Historic Interest In Wales In The Planning And Development Process (ASIDOHL2) (2007)
- Cadw's Conservation Principles (March 2011)
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CIfA 2020)
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CIfA 2020)
- Dyfed Archaeological Trust (DAT) standards and guidance for archaeological work

Baseline

8.26 Subject to a formal scoping opinion, an ES chapter will be produced, which will address built heritage, archaeological and historic landscape sub-topics. This will be supported by a combined archaeological and built heritage baseline study as a standalone appendix.

8.27 Information relating to cultural heritage and archaeology will be gathered through a preliminary desk-based assessment (DBA) to identify potential features of interest. The desktop research will be augmented by a walkover survey to provide information on the archaeological potential of the area and to validate the documentary evidence.

8.28 Overlapping study areas extending from the application site boundary are proposed to include any heritage assets that may extend into the Site, or which may be affected by indirect impacts or impacts on assets' settings.

8.29 The Inner Study Area (ISA) will comprise the Site boundary and a 2km buffer. The ISA will allow the development of the local historic environment to be understood in detail, to enable an assessment of the significance of known assets, and to identify the potential for currently unknown assets to occur, within the boundary of the Proposed Development.

8.30 A gazetteer of heritage assets within the study areas will be updated as the assessment progresses and included as an appendix to the baseline assessment. Data sources will include:

- Designation data and descriptions of designated heritage assets held by Cadw, downloaded from their website;
- Previous DBA and geophysical survey reports;
- Relicensing of the HER dataset from Dyfed Historic Environment Record (DHER); and

- Readily accessible published sources and unpublished archaeological reports.

8.31 LANDMAP data will be included within the LVIA and also used for the heritage assessment.

8.32 Up to date information will be requested from the above sources, however, obtaining copies of aerial photographs and historic mapping from the archives is scoped out of the work as this will have formed part of the scope for the previous DBA.

8.33 The proposed overlapping Outer Study Areas (OSA) for setting assessments are proposed as follows:

- Up to 2km from the site boundary: all non-designated historic assets
- Up to 5km from the site boundary: all designated historic assets
- Up to 10km from the site boundary: scheduled monuments, grade I and II* listed buildings, grade I and II* registered parks and gardens, registered landscapes of outstanding historic interest.
- Beyond 10km from the site boundary, based on ZTV: historic assets that are particularly sensitive to changes in their setting in the opinion of the assessor or consultees.

8.34 A stage 1 setting assessment following Cadw guidance will identify those assets for which the Proposed Development may result in changes within their setting with the potential to harm their cultural significance and will thus inform the scope of the detailed assessment of setting which will be included within the EIA. Intangible cultural heritage would also be considered at this stage, to include for example potential artistic or literary associations, sacred space, or local traditions and customs.

8.35 A staged approach to impact assessment is proposed. Field inspections will be made after a filtering exercise to identify those historic assets that would not experience visual change, and that can therefore be scoped out. This would be achieved by comparison of mapped historic assets against the Zone of Theoretical Visibility (ZTV) data and aerial imagery. For those assets which show a potential change to their setting by the development being visible, further analysis would be undertaken to assess the level of impact. The ZTV mapping uses a bare earth model and even when it suggests potential visibility of the Proposed Development from historic assets, intervening vegetation and structures might screen views, which will be confirmed through field inspections.

ASIDOHL 2

8.36 The introduction of the Proposed Development into the Milford Haven Waterway Registered Landscape of Outstanding Historic Importance would have direct and setting impacts. Development within registered historic landscapes is not forbidden, but the designation presents a further level of potential harm to the historic environment that would need to be robustly assessed. A full ASIDOHL2 would be required to complement any EIA and related planning submission.

8.37 This assessment will be carried out following the standard methodology as set out in "Guide To Good Practice On Using The Register Of Landscapes Of Historic Interest In Wales In The Planning And Development Process Revised (2nd) Edition" (Cadw & CCW 2007).

Environmental Impact Assessment

Assessment of Importance/Sensitivity

8.38 Analysis of the historic assets and historic mapping will allow synthesis and interpretation of the historic development of the site to be established in accordance with Cadw's Heritage Impact Assessment in Wales (section 4.2) and Conservation Principles for the sustainable management of the historic environment in Wales. This analysis will also establish what comprises the setting for the historic assets, and what elements of that setting contribute to how the asset is experienced, understood and appreciated. Assessment of the heritage importance (sensitivity) of all assets that may be affected would use the criteria in the following table (**Table 8.3**).

Table 8.3: Levels of importance/sensitivity

Importance	Criteria
Very high	World heritage sites; assets of acknowledged international importance; assets that can contribute significantly to acknowledged international research objectives; Historic landscape of international value (designated or not) and extremely well preserved historic landscape with exceptional coherence, time depth or other critical factor(s)
High	Scheduled monuments and non-designated assets of schedulable quality and importance; Listed buildings that can be shown to have exceptional qualities in their fabric or associations; Conservation Areas containing very important buildings; non-designated structures of clear national importance; designated and non-designated historic landscapes of historic interest; assets that can contribute significantly to acknowledged national research objectives.
Medium	Non-designated assets that contribute to regional research objectives; Locally listed buildings (historic unlisted buildings that have exceptional qualities); conservation areas containing buildings that contribute significantly to historic character.

Importance	Criteria
Low	Non-designated assets of local importance including those compromised by poor preservation; assets of limited value but with the potential to contribute to local research objectives; locally listed buildings; robust non-designated historic landscapes
Negligible	Assets with very little surviving archaeological interest; buildings of little architectural or historic note; landscapes with little significant historic interest

Assessment of Potential Impacts

8.39 The Proposed Development would result in a change to the existing baseline, and change might be considered as impacts according to the degree of change in relation to heritage significance. In accordance with EIA regulations, the assessment would identify impacts and effects as direct or indirect, adverse or beneficial, and short-term, long-term or permanent.

8.40 Direct impacts are those which physically alter an asset and therefore its heritage significance.

8.41 Impacts upon setting are those which affect the heritage significance of an asset by causing visual or sensory change within its setting. Application of Cadw's *Managing Setting of Historic Assets in Wales* will require a four-stage process in assessment of impacts:

- Stage 1: Identify the Historic Assets
- Stage 2: Define and Analyse the Setting
- Stage 3: Evaluate the Potential Impact of Change or Development
- Stage 4: Consider Options to Mitigate the Impact of a Proposed Change or Development

8.42 The impact will reflect the scale of change which would be caused by the Proposed Development and the effect this would have on ability to interpret significance and appreciate the historic asset.

8.43 An impact may be positive or negative where for example, as part of the Proposed Development, an intrusive building or feature is removed or replaced with a more harmonious one; historic features are restored or revealed; a new feature is added which adds to public appreciation; new views are introduced that add to public experience of an asset; or public interpretation or access is improved to an asset or its setting.

8.44 Impacts may impart major change, for example where groundworks completely destroy important archaeological remains, to minor change to part of a historic asset, leading to a limited impact on our ability to interpret it, or its context.

8.45 Utilising the key principles for assessing the implications of change outlined above, an assessment of the magnitude of impact will be implemented for each baseline historic asset (**Table 8.4**).

Table 8.4: Magnitude of Impact

Magnitude	Summary
Major	Change to key historic building elements so that an asset is totally altered; change to most/all key archaeological materials such that the resource is totally altered; comprehensive change to the setting
Moderate	Change to many key historic building elements, such as the asset is significantly modified; changes to many key archaeological materials such as the resources is clearly modified; changes to setting of historic buildings, such that it is significantly modified
Minor	Change to key historic building elements, such that the asset is slightly different; changes to key archaeological materials such that the asset is slightly altered; changes to setting of an historic building, such that it is slightly changes
Negligible	Very minor changes to historic building elements, archaeological materials or setting that hardly affect them/it
No Change	No change to fabric, archaeological materials or setting

Assessment of Significance of Effect

8.46 The EIA will assess the potential direct effects for historic assets from construction activities. Within the Outer Study Area assessment would be focussed on designated historic assets that, following the filtering process, are considered to have potential for more than minimal visual change with the potential to impact upon significance.

8.47 The assessment of effects will combine analysis of the data gathered during the DBA and site visit, photographs and wireframe visualisations of the topography and Proposed Development (produced by the LVIA consultants). Consideration will be given to assessing effects resulting from night time illumination following a review of the aviation lighting assessment and current baseline (if appropriate).

8.48 These assessments will be carried out using professional judgement, taking into account designations and heritage significance as assessed against national standards. Significance of effect will be based on a combination of importance (in other disciplines sometimes referred to as sensitivity of the receptor) and magnitude of impact. The significance of effect matrix is presented in **Table 8.5** and relates the importance to the magnitude of impact (incorporating the contribution from setting where relevant) to

establish the likely significance of effect. Effects of Major or Moderate significance are considered to be "significant effects".

Table 8.5: Significance of Effect

Magnitude of Impact	Importance of Historic Asset				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Major	**Major**	**Major**	**Moderate**	Minor	Negligible
Moderate	**Major**	**Major**	Minor	Minor	Negligible
Minor	**Major**	**Moderate**	Minor	Negligible	Negligible
Negligible	**Moderate**	Minor	Negligible	Negligible	Negligible

Cumulative Assessment

8.49 Cumulative effects will be considered in the EIA. Cumulative effects on the significance of historic assets may occur where the Proposed Development results in a residual effect on the significance of a historic asset and other developments also have an effect on the same asset.

Mitigation

8.50 Analysis of Geographic Information System (GIS) data relating to the historic environment will be used to identify historic assets that may be affected by the Proposed Development. This information will be provided to the design team to assist with avoiding or minimising both direct and indirect effects on historic assets. Where potential adverse impacts upon the historic environment is identified, measures to prevent, reduce and/or where possible offset these impacts will be proposed.

8.51 Adverse effects resulting from physical harm upon historic assets may be mitigated by an appropriate level of survey, excavation, recording, analysis and publication of the results, in accordance with a written scheme of investigation agreed with DAT. Archaeological investigation can have a beneficial effect of increasing knowledge and understanding of an asset, thereby enhancing its archaeological and historical interest and offsetting adverse effects.

8.52 For archaeological assets, recommendations for further works will be based on the findings of the combined archaeological and built heritage baseline study and ES chapter and may include but not be limited to:

- Archaeological investigations to identify and characterise known and unknown remains;

- Design solutions to avoid or reduce effects (preservation in situ);
- Targeted excavation and recording in advance of construction;
- Archaeological observation and construction-integrated recording; and
- Appropriate archiving and publication of findings.

8.53 Adverse effects resulting from visual change within the setting of historic assets can generally only be mitigated through changes to the design and layout of the Proposed Development, but can be offset through more general enhancement measures (though this will not reduce the overall level of impact).

8.54 Consultation would be undertaken with the consultation bodies to discuss any proposed mitigation.

Matters Proposed to be Scoped Out of EIA

8.55 It is proposed that the following is scoped out of the assessment of the Proposed Development:

- The extent of ground disturbance associated with decommissioning will not extend beyond the construction footprint and so decommissioning effects on any historic assets within the Site will not occur. Any residual operational phase setting effects will be reversed. Decommissioning effects are therefore proposed to be scoped out of the assessment.
- Construction phase setting effects would be temporary and are not considered to be significant in EIA due to their very short duration. Construction phase setting effects are therefore proposed to be scoped out of the assessment.
- As the application site has already been subject to a desk-based assessment and geophysical survey to support a previous solar farm application, it is proposed no additional baseline data gathering or evaluation work would be required to inform the EIA in relation to buried archaeology.

Key Questions for Consultees

8.56 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q8.1: Do the Consultees agree with the proposed methodology and scope of assessment, including the proposed matters to be scoped out of EIA? (Do the Consultees agree that as the application site has already been subject to a desk-based assessment and geophysical survey to support the solar farm application, no additional baseline data gathering or evaluation

work would be required to inform the EIA in relation to buried archaeology?)

- Q8.2: Do the Consultees agree with the study areas identified?
- Q8.3: Is there any current or recent archaeological work or projects being undertaken within or in the vicinity of the Site, that the results of which may not yet be recorded in the HER?
- Q8.4: Are the Consultees aware of any particular heritage assets with statutory protection within the wider landscape whose significance may be affected through development within their setting?
- Q8.5: Do the Consultees have details of any cultural heritage assets in the vicinity of the Site which it considers may raise significant issues within the EIA process for this Proposed Development?

9. NOISE – SCOPED IN

9.1 This section of the Scoping Report summarises the proposed scope for the noise assessment ES chapter being undertaken by specialist noise consultants Hayes McKenzie Partnership Ltd.

9.2 Sources of noise during operation of a wind turbine are mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions from the nacelle through isolation of mechanical components and acoustic insulation of the nacelle. Aerodynamic noise is controlled through the design of the blade tips and edges. In most modern wind turbines, aerodynamic noise is also restricted by control systems which actively regulate the pitch of the blades.

9.3 While noise from the wind turbines increases with wind speed up to a certain wind speed and then remains constant, at the same time ambient background noise at higher wind speed (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

9.4 Operational noise will be assessed in accordance with ETSU-R-97, The Assessment and Rating of Noise from Wind Farms, and the Institute of Acoustics, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise (GPG), as referenced with relevant Welsh planning policy.

9.5 Construction noise will be assessed according to BS 228:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites.

9.6 Vibration from the operation or construction of the scheme will be scoped out of detailed assessment.

Operational Noise Assessment Guidance

National Guidance

9.7 Future Wales: The National Plan 2040 together with Planning Policy Wales – Edition 11 (PPW11) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW11 provide the national planning policy framework for Wales.

9.8 New energy development is considered in paragraph 6.7.15 of PPW11 and the footnote to this section states that "Further guidance on wind turbine noise assessment can be found in ETSU-R-97 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/49869/ETSU_Full_copy__Search

able_.pdf and further good practice guidance published by the Institute of Acoustics: https://www.ioa.org.uk/publications/wind-turbine-noise"

The Assessment and Rating of Noise from Wind Farms (ETSU-R-97)

9.9 The assessment methodology for operational noise is described in ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*. The basic aim of ETSU-R-97 is to provide:

"Indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development or adding unduly to the costs and administrative burdens on wind farm developers or local authorities".

9.10 The report makes it clear from the outset that any noise restrictions placed on a development must balance the environmental impacts of the development against the national and global benefits which would arise through the development of renewable energy sources.

9.11 The specific methodologies involved in applying ETSU-R-97 to the Development will be detailed in full in the Environmental Impact Assessment however, in summary, these provide recommendations for noise limits relating to the existing levels of background noise for quiet day-time and night-time periods.

9.12 To carry out a noise assessment in accordance with ETSU-R-97, the following steps are required:

- Specify the number and locations of the wind turbines;
- Identify the locations of the nearest, or most noise sensitive, residential receptors;
- Determine the background noise levels as a function of site wind speed at the nearest neighbours, or at least at a representative sample of the nearest neighbours;
- Determine the quiet day time and night time noise limits from the background noise levels identified at the nearest neighbours;
- Specify the type and noise emission characteristics of the wind turbines proposed for the Development;
- Calculate the noise immission[79] levels due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours; and

[79] 'Immission' refers to the noise at a receiver location, whereas 'emission' relates to noise produced by a source.

- Compare the calculated noise immission levels with the derived noise limits and assess in the light of relevant planning requirements.

9.13 It is important to note that the baseline noise levels used to derive the relevant noise limits must not include noise from existing wind turbine development, and the derived noise limits then apply to operational noise from all wind turbine developments.

Good Practice Guide to the Application of ETSU-R-97 for Wind Turbine Noise Assessment

9.14 The Good Practice Guide (GPG)[80] was published by the Institute of Acoustics (IOA) in May 2013 (IOA, 2013). It presents current good practice in the application of the ETSU-R-97 assessment methodology for wind turbine developments at the various stages of the assessment. As well as expanding on and, in some areas, clarifying issues which are already referred to in ETSU-R-97, additional guidance is provided on noise prediction and a preferred methodology for dealing with wind shear

Local Planning Authority Guidance

9.15 Pembrokeshire County Council's *Supplementary Planning Guidance* on Renewable Energy, confirms that wind turbine noise should be assessed in line with ETSU-R-97 and the IOA GPG. In addition, it refers to BS 5228 in relation to the assessment of noise from construction activities.

Baseline

9.16 The existing baseline noise environment at noise sensitive receptors in the vicinity of the Proposed Development consists of a combination of natural and other sounds. Natural sounds include birdsong and wind generated effects, such as wind in the trees and foliage. Other sounds include road traffic noise, farming activities, noise from industrial activities (including the Dragon LNG site), existing wind turbine developments, and local noises such as running water and boiler flues, with the levels of each noise source being depended on the distance from the receptor and shielding.

9.17 As noted above, baseline noise levels used to derive the relevant noise limits must not include noise from existing wind turbine development, and the derived ETSU-R-97 noise limits then apply to operational noise from all wind turbine developments.

9.18 A baseline noise survey is being undertaken to derive noise limits in line with ETSU-R-97. The locations have been discussed with

[80] Institute of Acoustics (IOA) (2013), A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise.

Pembrokeshire County Council, and the results will be corrected to ensure existing turbine noise is not included in the derivation of the limits.

Existing Noise Limits

9.19 There are a number of operational wind turbine sites in the vicinity of the Proposed Development. Different noise limits have been applied to different wind turbine developments, and the applied limits will be used to inform the assessment of cumulative noise.

9.20 The existing wind turbines are shown at **Appendix A** in **Figure 2**.

Existing Wear Point Turbines

9.21 The noise limits for the operational Wear Point Wind Farm are set out at Planning Condition 11 (Pembrokeshire County Council Planning Reference No.09/0544/PA):

- 11. The level of noise emitted from the site shall not exceed 70 dB $L_{Aeq,8hr}$, as measured at the nearest noise sensitive property to the site.

Castle Pill

9.22 The nearest consented wind turbine to the majority of the receptor locations in the vicinity of the Proposed Development is the Castle Pill turbine (Planning application number 07/1567). The noise limits specified in the planning conditions are:

- The greater of 43 dB L_{A90} or plus 5 dB at night; and
- the greater of 45 dB L_{A90} or plus 5 dB during the daytime.

Scoveston Park (southern turbine)

9.23 The Scoveston Park, (application ref 14/1045) noise limits are set at:

- Absolute (fixed) limits of 38 dB L_{A90} and 45 dB L_{A90} at financially involved locations

Proposed study area

9.24 The proposed study area will be defined such that noise sensitive residential receptor locations are included in the operational noise assessment where the predicted operational noise levels from the Proposed Development acting in isolation are above 30 dB L_{A90}. This is 10 dB below the ETSU-R-97 upper daytime lower limiting value and 13 dB below the night time lower limiting value, such that the contribution from the Proposed Development can be considered to be negligible at residential receptors locations where predicted noise level are lower than this.

Operational Noise Assessment Methodology

9.25 It is proposed that appropriate noise limits can be derived and applied to the proposed Dragon Energy wind turbines acting in isolation. Meeting these derived noise limits would ensure that cumulative operational noise levels from the Proposed Development alongside other wind turbines in the area remain within acceptable levels.

9.26 The noise limits for Dragon Energy will be calculated by logarithmically subtracting the existing predicted operational noise levels from the following noise limits that apply to cumulative noise from all wind farm developments.

- The greater of 43 dB L_{A90} or background plus 5 dB at night; and
- the greater of 40 dB L_{A90} or background plus 5 dB during the daytime;
- or the greater of 45 dB L_{A90} or background plus 5 dB at receptor locations that are financially involved with the development.

9.27 The exception to this is at receptors in the vicinity of the most southerly Castle Pill turbine where the consented daytime noise limit of 45 dB L_{A90} (or plus 5 dB above background) will be applied as the relevant cumulative noise limit during the daytime.

9.28 There are a number of properties that cannot be downwind of the proposed turbines and other wind turbine developments in the vicinity, and therefore the limits will be calculated based on the predicted noise level from other wind turbine developments when the receptor location is downwind of the proposed turbines (i.e. when operational noise levels from the proposed turbines will be at their highest).

9.29 The derived noise limits will be discussed with Pembrokeshire County Council (PCC), and it is intended that a report describing the derivation of the noise limits is submitted to PCC and will be included as an appendix to the Environmental Statement

9.30 Baseline noise measurements will be undertaken to allow the cumulative noise limits to be related to background noise levels and the scope of the baseline noise measurements will be discussed with PCC.

9.31 In addition to the noise limits that will be derived for the Proposed Development, consideration will also be made to how much the cumulative noise levels increase due to the Proposed Development. Where the predicted increase is less than 1 dB the increase in operational noise levels will be considered to be negligible as the minimum perceptible change in noise level in the environment is about 3 dB (and the minimum perceptible change under laboratory conditions is about 1 dB).

Cumulative Assessment

9.32 ETSU-R-97 states that the noise limits that it specifies apply to the cumulative effect of noise from all wind turbines that may affect a particular location. The wind turbines listed in **Appendix C** and shown on **Appendix A, Figure 2** with a rated power output of greater than 50kW will be included in the cumulative operational noise assessment.

9.33 As described above, cumulative operational noise will be taken into account in the operational noise assessment by deriving appropriate noise limits for the Proposed Development. These limits will apply to the Proposed Development acting in isolation, and will ensure that, if the Proposed Development operates within the derived noise limits, cumulative operational noise levels will remain within allowable ETSU-R-97 noise limits.

Construction Noise

9.34 The following legislation and standards are of particular relevance to construction noise:

- The Control of Pollution Act 1974 (CoPA 1974);
- The Environmental Protection Act 1990 (EPA 1990); and
- BS 5228: 2009+a1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites.

9.35 CoPA 1974 provides local authorities in Scotland, England and Wales with powers to control noise and vibration from construction sites. Section 60 of CoPA 1974 enables a Local Authority to serve a notice to persons carrying out construction work of its requirements for the control of site noise. Section 61 of CoPA 1974 allows for those carrying out construction work to apply to the Local Authority in advance for consent to carry out the works.

9.36 The EPA 1990 specifies mandatory powers available to Local Authorities in respect of any noise that either causes, or is likely to cause, a statutory nuisance, which is also defined in the EPA 1990. A duty is imposed on Local Authorities to carry out inspection to identify statutory nuisances, and to serve abatement notices against these. Procedures are also specified with regards to complaints from persons affected by a statutory nuisance.

9.37 BS 5228 provides guidance on controlling noise and vibration from construction sites. It:

- Refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction sites;

- Recommends procedures for noise and vibration control in respect of construction operations; and
- Stresses the importance of community relations, stating that early establishment and maintenance of these relations throughout the carrying out of site operations will go some way towards allaying people's fears.

9.38 Noise from construction activities is unlikely to be significant due to the separation distances between the turbines and nearest noise sensitive receptors and the relatively short duration of the works. There may be some noisier activities related to track upgrades and track construction in the vicinity of noise sensitive receptors, but this would be a short duration impact. Nevertheless, the noise assessment will provide a summary of relevant guidance and best practice construction methods, along with a commitment to adhere to best practicable means of controlling noise from construction activities, as advocated by BS 5228. Such controls will be outlined in the CEMP. An indicative contents page for the CEMP can be found at **Figure 11**, **Appendix A**.

9.39 The potential influence of construction traffic will be reviewed, and assessed as necessary in terms of the increase in traffic noise at roadside locations, except where there is little or very little traffic movement in which case it will be assessed against the criteria in BS5228 for noise from construction plant.

Effects Scoped Out

9.40 There are various aspects that are proposed to be scoped out of the assessment or only discussed in general terms. This includes detailed construction noise prediction, for the reasons discussed above, and issues frequently raised by third parties in wind farm development in general, such as infrasound, low frequency noise and amplitude modulation. Each of these topics will be discussed in generalised terms within the noise chapter of the Environmental Statement for the Proposed Development, and a detailed assessment is either not possible and/or not considered necessary.

9.41 Noise from decommissioning activities will be scoped out as the overall noise impacts are usually lower than during the construction phase, and will be assessed and mitigated as required at the time of decommissioning.

9.42 Operational noise effects will be scoped out where the predicted noise levels from the Proposed Development are below 30 dB L_{A90} which is 10 dB below the lowest noise limit applicable to cumulative wind farm noise. Where predicted noise levels from the Proposed Development are 10 dB or more below the lowest applicable noise limit then its contribution at noise sensitive properties can be considered to be negligible.

9.43 Vibration has been scoped out of the construction, operation, and decommissioning assessments as levels of vibrations will be negligible. Ground-borne vibration during the operational phase of the development will not be perceptible at receptor locations, nor on the wind farm site itself. Levels of vibration during the construction and decommissioning phases are unlikely to be perceptible, except if there are short term construction activities in the near vicinity of receptor locations, where levels of vibration in any case will be significantly below the criteria set out in BS 5228 *Code of Practice for Noise and Vibration Control on Construction and Open Sites*.

9.44 Cumulative operational noise from the proposed wind turbines in conjunction with other (non-wind turbine) sources has been scoped out as the noise limits apply to wind turbine noise only.

Mitigation

Construction Noise

9.45 It is unlikely that any form of mitigation will be required unless any site access track works are required in the very close vicinity of residential properties. Mitigation measures would be incorporated into site design by avoiding access track proximity to residential properties, following good practice in construction techniques including avoiding work out of normal day-time construction hours wherever possible as will be set out in the CEMP.

Operational Noise

9.46 Modern pitch regulated turbines, of the type proposed here, have the ability to run in reduced noise modes under critical wind speed and direction conditions by reducing rotor speed, at the cost of a certain amount of power output. It is anticipated that the site will be designed such that the relevant limits can be met without mitigation, however, mitigation can be implemented if necessary.

Key Questions for Consultees

9.47 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q9.1: Do the Consultees agree with the proposed method of assessment?
- Q9.2: It is not proposed that cumulative noise from the solar farm and wind farm is considered as each is assessed against different criteria. Do the Consultees agree?

- Q9.3: Are the Consultees aware of any additional potential noise-sensitive receptors, such as new housing developments?
- Q9.4: Are there any other wind energy developments which should be taken into consideration in the cumulative noise assessment alongside those listed in **Appendix C**?
- Q9.5: What are the Council's requirements for the provision of information on noise during construction?

10. TRAFFIC AND TRANSPORT – SCOPED IN

Introduction

10.1 This section of the Scoping Report presents the proposed scope for the transport and access ES Chapter and related assessment being undertaken by specialist consultants Pell Frischmann Consultants Limited (Pell Frischmann).

10.2 The section covers the predicted transport and access issues that may arise from the construction of the Proposed Development, the significance of these effects and what suitable mitigation can be put in place to avoid, minimise or offset any adverse impacts for road users and residents within the study area.

10.3 The Transport & Access Environmental Statement chapter will be supported by a Transport Assessment report, Abnormal Load Route Survey and technical figures.

10.4 The key issues for consideration as part of the assessment will be:

- The temporary change in traffic flows and the resultant, temporary effects on the receptors located in the study network during the construction phase;
- The physical mitigation associated with the delivery of abnormal loads;
- The design of new access infrastructure; and
- The consideration of appropriate and practical mitigation measures to avoid, minimise or offset any temporary effects.

10.5 The potential effects of these will be examined in detail.

Methodology

10.6 The Guidelines for the Environmental Assessment of Road Traffic (IEMA 1993) sets out a methodology for assessing potentially significant environmental effects on road users and residents. In accordance with this guidance, the scope of assessment will focus on:

- Potential impacts (of changes in traffic flows) on local roads and the users of those roads; and
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

10.7 The following rules taken from the guidance will be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

10.8 Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible environmental impact and as such no further consideration will be given to the associated environment effects.

10.9 The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing and new traffic survey data, in order to determine the percentage increase in traffic.

10.10 Potentially significant environmental effects will then be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate.

10.11 Committed development traffic, i.e. those from proposals with planning consent, will be included in baseline traffic flows, where traffic data for these schemes is considered significant and is publicly available. Developments that are proposed or at Scoping would not be included.

10.12 Traffic associated with the nearby solar park application will not be included in the assessment as the works for this development will be complete prior to works commencing at the Proposed Development.

10.13 It is not anticipated that a formal Transport Assessment will be required as these are not generally considered necessary for temporary construction works. A reduced scope Transport Assessment, appropriate for the type and scale of development, is therefore proposed and will be appended to the ES.

10.14 Each turbine is likely to require between 11 and 14 abnormal loads to deliver the components to site. The components will be delivered on extendable trailers which will then be retracted to for the return journey.

10.15 Detailed swept path analyses will be undertaken for the main constraint points on the route from the port of entry through to the site access junction to demonstrate that the turbine components can be delivered to site and to identify any temporary road works which may be necessary.

10.16 An initial review of Abnormal Indivisible Load (AIL) access suggests that the access route for turbine components will be from Pembroke Docks to the Proposed Development via Western Way, London Road, A477, Scoveston Road, B4325 and entering the site via the West Perimeter Road. The Route Survey Report (RSR) will confirm the chosen route and will detail any accommodation works.

Baseline Conditions

10.17 The study area for the assessment will feature the principal routes to site for raw material deliveries required during the construction process. These links will include:

- The A40 to the east of Haverford West;
- The A4076 from its junction with the A40, through to its junction with the A477;
- The A477 between the A4076 and Scoveton Road junctions;
- Scoveton Road;
- The B4325 from its junction with Scoveton Road to the site access junction.

10.18 These links will include sensitive receptors that will be assessed within the assessment. These will include road users on road links within the study area and, but not limited to, residents and users of the settlements of Waterston, Johnston and Haverfordwest.

10.19 Construction traffic will not be permitted to the west of the site access junction on the B4325 due to the sinuous geometry and unsuitable vertical alignment at Black Bridge.

10.20 Existing traffic count data will be used from the Department for Transport (DfT) database for the A40 (site 99788), A4076 (sites 50561 and 30646). New Automatic Traffic Counter (ATC) surveys for the A477 (at Johnston), Scoveston Road and B4325 (at Green Lane) will be commissioned and deployed for one week to record classified traffic data during a neutral month. The proposed ATC locations are shown on **Figure 10a** and **Figure 10b**.

10.21 Three years of traffic accident data will be collected using the online resource crashmap.co.uk for Scoveton Road and the B4325 to inform the baseline review.

10.22 Online sources such as the National Cycle Route map and Ordnance Survey maps will be used to obtain details of the sustainable travel network.

Assessment of Effects

10.23 The IEMA 'Guidelines for Environmental Impact Assessment' (2005) notes that the separate 'Guidelines for the Environmental Assessment of Road Traffic' (1993) document should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines intend to complement professional judgement and the experience of trained assessors.

10.24 In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.

10.25 The sensitivity of receptors is summarised in **Table 10.1**. A full review of potential receptors will be detailed in the Transport & Access Chapter and will be based on the following criteria.

Table 10.1: Sensitivity of Receptor Criteria

Sensitivity of Receptor	**Criteria for Road Users**
High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic
Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition
Negligible	Where roads have no adjacent settlements.
Sensitivity of Receptor	**Criteria for Residents / Locations**
High	Where a location is a large rural settlement containing a high number of community and public services and facilities
Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services
Low	Where a location is a small rural settlement, few community or public facilities or services
Negligible	Where a location includes individual dwellings or scattered settlements with no facilities

10.26 The IEMA Guidelines identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:

- Severance – the IEMA Guidance states that, "severance is the perceived division that can occur within a community when it becomes separated by a major traffic artery." Further, "Changes

in traffic of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' [or minor, moderate and major] changes in severance respectively". However, the Guidelines acknowledge that "the measurement and prediction of severance is extremely difficult".

- Driver delay – the IEMA Guidelines note that these delays are only likely to be "significant [or major] when the traffic on the network surrounding the development is already at, or close to, the capacity of the system.".
- Pedestrian delay – the delay to pedestrians, as with driver delay, is likely only to be major when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road and would be considered major.
- Pedestrian amenity – the IEMA Guidelines suggests that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or its lorry component) is halved or doubled. It is therefore considered that a change in the traffic flow of -50% or +100% would produce a major change in pedestrian amenity.
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and major changes respectively.
- Accidents and safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents.

10.27 While not specifically identified, as a more vulnerable road user, cyclists are considered in similar terms to pedestrians.

10.28 To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified as set out below in **Table 10.2**.

Table 10.2: Significance of Effect

	Magnitude of Impact			
Sensitivity of Receptor	**High**	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

10.29 Standard mitigation measures that will be included in the assessment include the following:

- Production of a Construction Traffic Management Plan;
- The design of suitable access arrangements with full consideration given to the road safety of all road users;
- A Staff Sustainable Access Plan; and
- A Framework Abnormal Load Transport Management Plan.

10.30 Additional mitigation will be included should the assessment reveal criteria that are significant following the application of the above standard mitigation measures.

Impacts Scoped out of the Assessment

10.31 Once operational, it is envisaged that the level of traffic associated with the Proposed Development will be minimal. Regular monthly or weekly visits would be made to the wind farm for maintenance checks. The vehicles used for these visits are likely to be 4x4 vehicles and there may also be the occasional need for an HGV to access the wind farm for specific maintenance and/or repairs. It is considered that the effects of operational traffic would be negligible and therefore no detailed assessment of the operational phase of the development is proposed.

10.32 The traffic generation levels associated with the decommissioning phase will be less than those associated with the development phase. As such, the construction phase is considered the worst case assessment to review the impact on the study area. An assessment of the decommissioning phase will therefore not be undertaken, although a commitment to reviewing the impact of this phase will be made immediately prior to decommissioning works proceeding.

Key Questions

10.33 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q10.1: That the proposed methodology is acceptable?
- Q10.2: That the methods proposed for obtaining traffic flow data are acceptable?
- Q10.3: That the use of Low National Road Traffic Forecasts (NRTF) is acceptable for the whole of the study?
- Q10.4: What committed development schemes should be included in the assessment?
- Q10.5: Is a separate AIL Transport Management Plan report required to accompany the planning submission, given that the Welsh Government will insist on planning conditions requiring this?

11. SAFETY (MAJOR ACCIDENTS AND DISASTERS) – SCOPED IN

Introduction

11.1 The EIA Regulations state than an EIA must identify, describe and assess in an appropriate manner, the expected effects deriving from the vulnerability of the development to risks, so far as relevant to the development, of major accidents and natural disasters. This section describes the proposed approach to the Safety Chapter to be included within the Environmental Statement, and in doing so seeks to scope out an assessment of natural disasters, and potential construction and decommissioning effects.

Baseline

11.2 The Dragon LNG terminal is an 'Upper Tier' COMAH establishment, defined as such under Directive 2012/18/EU[81] (the 'Seveso III' Directive), as transposed in the UK by the Control of Major Accident Hazards (COMAH) Regulations 2015[82]. The regulations apply due to the controlled quantity of LNG which is stored at the site[83], and requirements include the preparation of a COMAH Safety Report, which must include a Major Accident Prevention Policy (MAPP), preparation and testing an on-site emergency plan, and making available relevant information to authorities and the public.

11.3 The LNG storage capacity also requires that a Hazardous Substances Consent[84] is in place, which is granted by PCC (reference 14/1127/HS).

11.4 LNG regassification is a combustion process which requires that the Dragon terminal operates the site under the Conditions of an Environmental Permit, (reference EPR/AP3136UA), regulated by NRW.

11.5 The regulatory requirements of these various consents have been duly considered in the options appraisal, location and design evolution for the Proposed Development (see Chapter 4).

11.6 Other sensitive infrastructure includes gas pipelines which are owned and operated by National Grid; consultation has already commenced with National Grid Gas Plant Protection to ensure that its requirements will be met.

81 European Union (2012) Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.
82 The Control of Major Accident Hazards Regulations 2015. SI 2015 No.483.
83 Two full containment LNG storage tanks (maximum capacity of 165,000m3 each, nominal capacity 154,000m3)
84 The Planning (Hazardous Substances) (Wales) Regulations 2015. WSI 2015 No. 1597 (W. 196)

Technical Guidance

11.7 Throughout all design and operational phases of the Proposed Development, consideration will be made to the following relevant technical guidance:

- Wind Turbine Safety Rules 4th Edition[85];
- Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules 4th Edition[86];
- Onshore Wind Health & Safety Guidelines[87]
- Health and Safety Executive, HSE (2015) Guidance on COMAH Regulations[88]

11.8 In the EIA process, the main procedural guidelines of IEMA's *Major Accidents and Disasters in EIA* Primer[89] will be followed.

Approach

11.9 Health and Safety during the construction and decommissioning phases of the Proposed Development will be subject to relevant legislation (e.g. the Construction Design and Management (CDM) Regulations), and best practice. This will involve site inductions, risk assessment and method statements as implemented by the Construction Management Plan (CMP). Therefore, potential environmental consequences will be inherently controlled and managed and there is no additional requirement for Health and Safety to be assessed during the construction and decommissioning stages within the EIA, and it is proposed to be scoped out of further assessment.

11.10 The vulnerability of the Proposed Development to the potential risks of incidents or a major accident is related to the probability of natural disasters, associated with the site location of the Proposed Development. This aspect is discussed in the following paragraphs.

11.11 The consideration of natural events, and evidence that the development itself will be resilient to climate change and flooding,

[85] The Energy Institute (2021) Wind Turbine Safety Rules, 4th Edition (June 2021). https://www.energyinst.org/industry/wind-turbine-safety-rules [Accessed April 2022]
[86] The Energy Institute (2021) Guidance & Supporting Procedures on the Application of Wind Turbine Safety Rules, 4th Edition. Available at: https://www.energyinst.org/industry/wind-turbine-safety-rules [Accessed April 2022]
[87] The Energy Institute (2021) Onshore Wind Health & Safety Guidelines. Available at https://www.energyinst.org/industry/wind-turbine-safety-rules [Accessed April 2022]
[88] Health and Safety Executive (2015). Control of Major Accident Hazards (COMAH) Regulations 2015, Guidance on Regulations, Reference L111 (Third edition), Available at: https://www.hse.gov.uk/pubns/books/l111.htm [Accessed April 2022]
[89] Institute of Environmental Assessment and Management (IEMA) (2020), Major Accidents and Disasters in EIA; A Primer, September 2020.

will be drawn from conclusions of other relevant ES chapters, primarily Hydrology and Hydrogeology.

11.12 The Proposed Development is not located within an area known for natural disasters such as floods, hurricanes, tornadoes, volcanic eruptions, earthquakes or tsunamis. Of these the risk of flooding is the most relevant likely incident, albeit that the Proposed Development site is not located in an area of high flood risk.

11.13 Considering identified climate change trends, increased windstorms is the issue which may affect the Proposed Development. Design mitigation for this risk is inherent in that brake mechanisms installed on turbines allow them to be operated only under specific wind speeds, and should severe windstorms be experienced then the turbines would be shut down. Although an unlikely event in the locality, the brake mechanism could also apply to a hurricane scenario.

11.14 Appropriate design and health and safety management protocols will be implemented to prevent or minimise the occurrence of any major accidents. Infrastructure will be placed outwith flood zones to mitigate the likelihood of flooding to affect breaking mechanisms, installed to allow shut down of the turbines during severe windstorms. Although it is difficult to design plant and infrastructure to be resilient to natural disasters such as earthquakes or tornados, the Proposed Development is not located in an area prone to such disasters and the likelihood of such an event is extremely rare.

11.15 Overall, it is concluded that significant effects are very unlikely to arise due to natural disasters, either upon or as a consequence of the Proposed Development, and it is proposed that this topic can be scoped out of the EIA.

11.16 Whilst unlikely to occur in this part of Wales, ice throw is a phenomenon which can occur when ice, which builds up on the blades, is dislodged when the blades begin to turn. Modern turbines are fitted with sensors which can shut the turbine down during icy conditions to prevent ice throw, thereby controlling this risk.

11.17 In terms of proximity to the existing Dragon Terminal it is proposed that the EIA will include a supporting technical risk assessment, confirming that the probability of major accident scenarios associated with the operation of the wind turbines within the vicinity of the process plant, infrastructure and LNG import jetty would be acceptable. A technical report on blade throw risk is in preparation and will be submitted with the ES.

11.18 Potential incidents arising from the LNG terminal operations upon the wind turbines, and those potentially caused by the turbines with an associated impact and accident within the terminal, will be assessed, in accordance with the relevant IEMA guidelines[89] on

hazard identification, impact significance and mitigation measures. Key to this review will be the design and management control measures as set out in the existing COMAH Safety Report for the Dragon terminal.

Key Questions for Consultees

11.19 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q11.1: Do the consultees agree with the proposed approach to the safety chapter?
- Q11.2: Do the consultees agree that construction and decommissioning incident and accident impacts will be suitably controlled by relevant health and safety legislation and best practice management, such that these phases can be scoped out of detailed environmental assessment in the EIA?
- Q11.3: Do the consultees agree that the incident risks associated with natural disasters, other than flooding, can be scoped out of detailed environmental assessment in the EIA?

12. GROUND CONDITIONS AND CONTAMINATION – PROPOSED TO BE SCOPED OUT

Introduction

12.1 This section of the Scoping Report considers whether there would be likely significant effects related to ground conditions and contamination as a result of the Proposed Development. Such effects relate to the historical, geological and environmental setting of the Site, including potentially sensitive geological sites, geological resources and the potential for "contamination" (that could potentially cause harm) arising from naturally occurring substances and/or past land use activity. This assessment is based on receptor sensitivity and the potential magnitude of the effect, as well as the probability of the effect occurring. This approach reflects the requirement of relevant legislation and guidance for effects to be considered using a risk-based approach.

12.2 For the Proposed Development it is proposed that Ground Conditions and contamination can be scoped out from the EIA and a specific ES Chapter would not therefore be provided.

Sources of Information

12.3 The study area for Ground Conditions & Contamination baseline assessment is the site boundary.

12.4 The following sources of information have been used to inform the baseline assessment and identify any sensitive receptors:

- A review of British Geological Survey (BGS) Sheet 228 Haverfordwest 1:50,000 1976 (solid and drift editions).
- A review of British Geological Survey (BGS) geological data available on their Onshore GeoIndex webpage, including digital geological mapping, historical borehole records and mining (other than coal mining).
- A review of the Coal Authority Interactive Map Viewer for coal mining information and to inform whether more detailed review is required.
- A review of the existing desk studies and site investigation report (Geotechnical Assessment for Milford Haven Wind and Solar by South West Geotechnical Ltd, June 2021) for the combined solar and wind development at the site.
- Review of the Lle Geo-Portal website (developed as a partnership between Welsh Government and Natural Resources Wales) and DEFRA Magic Map website to identify sensitive geological sites and relevant statutory designated sites.

Baseline Assessment

Ground Conditions

12.5 According to British Geological Survey (BGS) mapping, the main Proposed Development area (the fields within which the wind turbines would be located / main Dragon Energy Design Area) is underlain by sandstones, siltstones, and conglomerates of the Devonian-era Coheston Group. The access road is underlain by Milford Haven Group (Argillaceous Rocks and Sandstone, Interbedded).

12.6 The BGS do not record any superficial deposits and bedrock is anticipated at or near surface. The BGS do not record any artificial or made ground.

12.7 The BGS mapping also indicates that a geological fault is present, trending northwest-southeast, along the boundary of the adjacent Dragon LNG terminal to the north.

12.8 According to the Coal Authority Interactive Viewer, the site is not within a Coal Mining Reporting Area and would therefore not be expected to be affected by coal mining. A CON29M Coal Mining Report contained within Southwest Geotechnical's Geotechnical Assessment report did not identify any known or potential coal mining risks for the Proposed Development.

12.9 The BGS GeoIndex does not have any record of other mining.

12.10 The site investigation works undertaken by Southwest Geotechnical generally confirmed the presence of topsoil, overlying a mantle of residual soils (weathered sandstone bedrock), grading into less-weathered sandstone bedrock at depths of between 0.40m and 2.80m below ground level.

12.11 Within the development, made ground was only identified in one trial pit in the south-east (TP13) as reworked natural materials (clay), containing some 'charcoal', extending to a depth of 1.9m below ground level. This is likely to be localised infill, potentially associated with agricultural activity.

12.12 Southwest Geotechnical did not identify any evidence of suspected contamination in their Geotechnical Assessment report.

12.13 Two earthworks mounds are present in the north of the main development area and it is understood that these comprise materials associated with the earthworks platforming construction of the two tanks on the southern edge of the Dragon LNG terminal. These tanks were constructed in a previously undeveloped 'greenfield' area and are therefore expected to comprise re-worked natural materials.

Historical Land Use

12.14 The Southwest Geotechnical's Geotechnical Assessment report noted that the Proposed Development area has remained undeveloped since the earliest available historical mapping records c.1864. The northern part of the access road comprises the existing Western Perimeter Road serving the Dragon LNG terminal to the north.

12.15 The historical Ordnance Survey (OS) mapping (up to 2000) contained in the Southwest Geotechnical report identified the following potential contaminative activities in the surrounding area to the Proposed Development:

- an Old Quarry present to the east (~700m) in c.1908; and
- the existing Dragon LNG terminal and the associated jetty pipelines to the immediate north and east since c.1970.

12.16 Current OS mapping shows the two LNG storage tanks have since been constructed on the southern edge of the Dragon LNG plant.

Landfill Records

12.17 The Natural Resources Wales Lle map browser indicates that there are no records of historic landfill sites present within 2km of the Proposed Development.

Ground Gases

12.18 The BGS GeoIndex indicates that the site is within a 1km grid square where the predicted maximum radon potential is 10-30%.

12.19 No significant deposits of organic materials that could potentially give rise to ground gases (including carbon dioxide and methane) were identified in Southwest Geotechnical's Geotechnical Assessment report.

12.20 Mining is not present beneath the site therefore and mine gases will not be present.

Sensitive and Statutory Sites

12.21 DEFRA Magic Map website does not indicate any sensitive or designated sites within the Proposed Development. The Milford Haven Waterway SSSI and Pembrokeshire Marine SAC is located adjacent to the southern boundary of the site.

12.22 According to the citation, the Milford Haven Waterway SSSI is of special interest for its geology, ancient woodland, marine biology, saltmarsh, swamp, saline lagoons, rare and scarce plants and invertebrates, nationally important numbers of migratory

waterfowl, greater and lesser horseshoe bats *Rhinolophus ferrumequinum* and *R. hipposideros*, and otter *Lutra lutra*.

12.23 The geology element of the designation relates to the geological exposure of the Sandy Haven Formation at Little Castle Head, approximately 7km west of the Proposed Development and is therefore not considered relevant to the Proposed Development.

12.24 The Natural Resources Wales Lle map browser does not indicate any geodiversity sites (Geological Conservation Review, Regionally Important Geological and Geomorphological Sites) within or adjacent to the Proposed Development.

Geological Resources

12.25 Based on a review of the BGS records, geology, historical mapping and (lack of) mining records, it is not considered that there are any important economic geological resources present with the Proposed Development area that could or would potentially be developed in the future.

Consultations

12.26 Natural Resources Wales (NRW) and Pembrokeshire County Council are being consulted through this Scoping Report (see Key Questions for Consultees below), regarding any recorded historical site activity resulting in pollution incidents and/or Part IIa Contaminated Land designation, as well as any records pertaining to landfill or waste handling activities within the Proposed Development and /or adjacent area.

Potential Significant Effects

12.27 No potentially significant effects have been identified based on the following:

- No sensitive or designated geological sites are present in the Proposed Development area. Although geology is listed as an interest feature for the adjacent Milford Haven Waterway SSSI, the geology element actually relates to a coastal bedrock exposure some c.7km west of the site and is therefore not relevant to the Proposed Development.
- The Proposed Development area is largely 'greenfield' and is not known to have been subject to previous industrial development or other activities that could give rise to potential contamination.
- Existing earthworks mounds present in the Proposed Development area are understood to be associated with the earthworks platforming and are anticipated to comprise re-

worked natural materials and therefore are not a potential source of contamination.

- There are no records of landfilling or waste deposition on the site and could be a source of contamination or landfill gases. The Dragon LNG terminal has been subject to operation under an Environmental Permit since commissioning in 2009 (see Chapter 11), and there are no records of any material spillages or incidents which might have impacted the Proposed Development site.
- The Proposed Development is within an area with a relatively high radon gas potential (predicted to be up to 10-30%), however, the nature of the development will not be sensitive to the effects of radon gas.
- No other sources of ground gases have been identified.
- It is not considered that there are any important economic geological resources present with the Proposed Development area.

Evaluation and Impact Assessment

12.28 Based on the identified baseline conditions, as no potential significant effects have been identified (due to a lack of potential contamination sources and a lack of sensitive geological interest receptors) it is proposed that Ground Conditions should be scoped out of the EIA.

Key Sensitive Receptors

12.29 No significant effects or sensitive receptors have been identified.

Key Questions for Consultees

12.30 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q12.1: Are Natural Resources Wales (NRW) or Pembrokeshire County Council aware of any records of potential sources of contamination at the site, including but not limited to?
    - Any waste management facilities;
    - Potentially contaminative former or current land uses;
    - Pollution incidents (and incident reports, if these have occurred);
    - Surface water and / or groundwater discharges;
    - Surface water and / or groundwater abstractions; and

- The presence of hazardous substances.

- Q12.2: Do Natural Resources Wales (NRW) and Pembrokeshire County Council agree with scoping out Ground Conditions and Contamination from the EIA, based on the information presented and subject to responses to Key Questions?

13. HYDROLOGY AND HYDROGEOLOGY – PROPOSED TO BE SCOPED OUT

13.1 This chapter of the Scoping Report considers the likelihood of impacts on the hydrology and hydrogeology conditions of the Site, including flood risk, as a result of the Proposed Development.

13.2 This assessment concludes that this topic can be scoped out of detailed consideration in the EIA and thus a dedicated ES Chapter is not required.

Survey Effort

13.3 The initial desk-based baseline study has examined the catchments and the conditions of the water resources onsite and downstream of the site. The desk-based study included a review of the following data sources:

- review of Ordnance Survey ('OS') maps to identify surface water features;
- review of the Natural Resource Wales (NRW)'s River Basin Management Plans;
- identification of the locations and characteristics of catchments, surface water features and springs within and adjacent to the site;
- identification of WFD classifications and objectives, obtained from the NRW website for watercourses and waterbodies within and adjacent to the site;
- identification of hydrogeological conditions and groundwater resources (including groundwater vulnerability and productivity); together with secondary information relating to:
    - bedrock and superficial geology mapping;
    - review of soil mapping; and
- review existing site specific reports and data:
    - SLR (December 2021) Dragon LNG PV Farm Flood Consequence Assessment;[90] and
    - South West Geotechnical Ltd (June 2021) Geotechnical Assessment for Milford Haven Wind and Solar

[90] SLR (December 2021) Dragon LNG PV Farm Flood Consequence Assessment [online]. Accessed March 2022. Available at: https://planningdocs1.pembrokeshire.gov.uk/PublicAccess_LIVE/Document/ViewDocument?id=56F401AEEC254AF2B57A58DFD176064E

Baseline

Surface Water Features

13.4 In the northern area of the site (by the access track to the turbine locations) there is an unnamed watercourse (fed by springs), which flows from northeast to southwest by West Perimeter Road. A small pond located within the site and its outfall also discharges to this watercourse. To the west of the site boundary, the unnamed watercourse flows into a reservoir (as labelled on OS 1:10,000 scale mapping), after which it discharges into the Man of War Road section of the Milford Haven.

13.5 The entirety of the site is located within the 'DrainToTRAC' surface water body catchment,[91] which does not have an associated river body and therefore the condition of surface water features within this catchment are not monitored under the Water Framework Directive (WFD).

13.6 The site is not located within a Nitrate Vulnerable Zone (NVZ).[91]

Groundwater

13.7 The entirety of the site is located the 'Cleddau and Pembrokeshire' groundwater catchment, which has an overall WFD 'Poor' status.[91]

13.8 According to the BGS 1:50,000 mapping,[92] there are no superficial deposits within the site. To the south of the site there are mapped Tidal Flat Deposits, made up of sand silt and clay.

13.9 Published BGS mapping shows[92] that southern area of site (where the proposed turbines would be located) is underlain by the Cosheston Group, which is composed sandstone bedrock. The northern areas of the site are underlain by the bedrock of the Milford Haven Group, which is composed of interbedded argillaceous rocks and sandstone. There are a series of faults with a northwest to southeast strike located between Cosheston Group and the Milford Haven Group. The Cosheston Group and the Milford Haven Group are considered a Secondary A aquifer,[93] which is defined as "*permeable layers that can support local water supplies, and may form an important source of base flow to rivers*."[94]

[91] Natural Resources Wales (2022) Lle Map [online]. Accessed February 2022. Available at: http://lle.gov.wales/map#m=-4.97062,51.72231,13&b=europa&l=160h;846h;848h;784h;842h;850h;41h;37;61;844;852h;5h;12h;289h;1356h;6h;15h;1451h;1449h;1463h;1461h;1455h;1457h;1465h;1467h;1459h;1453h;11h;46h;772h;285h;

[92] British Geological Survey (2022) Geology of Britain View (Classic) [online]. Accessed February 2022. Available at: https://mapapps.bgs.ac.uk/geologyofbritain/home.html

[93] MAGIC Partnership (2021) MAGIC Map. Online. Accessed February 2022. Available at: https://magic.defra.gov.uk/MagicMap.aspx

[94] Environment Agency (2017) Guidance: Protect groundwater and prevent groundwater pollution. Online. Accessed February 2022. Available at: https://www.gov.uk/government/publications/protect-groundwater-and-prevent-groundwater-pollution/protect-groundwater-and-prevent-groundwater-pollution

13.10 South West Geotechnical Ltd's (June 2021) Geotechnical Assessment for Milford Haven Wind and Solar reported that "*Groundwater was encountered within the RC* [Rotatory Core] *borehole sections during the investigation at depths of between 7.00-14.0m below ground level*."

13.11 The site is not located in in a groundwater Source Protection Zone.[91]

Hydro-designated sites

13.12 The following designated sites have been identified as being designated for their hydrological / hydrogeologic features and are downstream of the site:

- Pembrokeshire Marine Special Areas of Conservation (SAC); and
- Milford Haven Waterway Sites of Special Scientific Interest (SSSI).

Flood Risk

13.13 NRW Flood Risk Viewer[95] indicates that the site is not at risk of flooding from rivers or sea. The unnamed watercourse to the west of the site boundary and other smaller drains are shown to be at low to high flood risk from surface water flooding. The area where the proposed turbines would be located is not shown to be at surface water flood risk.

13.14 SLR's (December 2021) Dragon LNG PV Farm Flood Consequence Assessment found that the site is within Zone A[96] and the site is therefore "*at very low risk of flooding from any potential sources.*" The proposed turbines are also located within the Zone A area, therefore, the finding of SLR's Dragon LNG PV Farm Flood Consequence Assessment apply to the site.

Desk Study and Consultations

13.15 NRW has been consulted regarding abstractions, discharges, surface water and groundwater quality data within the site and surrounding area. Pembrokeshire County Council has been consulted regarding the presence of Private Water Supplies within or close to the site. The information collected through these consultations will be incorporated in the Construction Environmental Management Plan (CEMP). An indicative content page for the CEMP can be found at **Figure 11**, **Appendix A**.

[95] Natural Resource Wales (2022) Flood Risk Map Viewer [online]. Accessed February 2022. Available at: https://maps.cyfoethnaturiolcymru.gov.uk/Html5Viewer/Index.html?configBase=https://maps.cyfoethnaturiolcymru.gov.uk/Geocortex/Essentials/REST/sites/Flood_Risk/viewers/Flood_Risk/virtualdirectory/Resources/Config/Default&layerTheme=0

[96] Technical Advice Note 15 Development and Flood Risk Figure 1 fore Zone A: Considered to be at little or no risk of fluvial or coastal/tidal flooding is used to indicate that a justification test is not applicable and there is no need to consider flood risk further.

Potential Significant Effects

13.16 The potential impacts (construction, operational and decommissioning) identified include the following:

- increased runoff on exposed ground causing erosion and pollution;
- increase in silt and sediment loads as a result of construction and decommissioning works;
- disturbance or erosion of bed and banks of watercourses and land drains;
- increased runoff from hardstanding areas causing erosion and pollution;
- changes to watercourse morphology;
- point source pollution from accidental spillages; and
- disruption/cut off of natural surface water and groundwater pathways.

Evaluation and Impact Assessment

13.17 The design of the Proposed Development would take into account best practice guidance. This includes locating deep excavations (e.g. turbine foundations) away from hydrologically sensitive areas, restricting drainage to greenfield runoff rates, retaining hydraulic connectivity across the site and adopting pollution prevention measures. As a consequence, mitigation measures will be incorporated into the design and will adhere to the implementation of standard best practice, together with bespoke measures that relate to the baseline environment.

13.18 Mitigation measures (e.g., pollution prevention and the design and incorporation of Sustainable Drainage Systems ('SuDS'), with applicable climate change allowances in the design of the Proposed Development) will be designed to avoid, reduce or offset potential adverse effects and these will inform the Proposed Development's design, including its layout. The mitigation proposed in a CEMP (see Appendix A, Figure 11 CEMP Contents List) or equivalent, if required will also provide preliminary hydrological and hydrogeological monitoring proposals.

13.19 As the Proposed Development would incorporate embedded mitigation within its design (e.g. any drainage being restricted to greenfield runoff rates taking into account the solar schemes drainage) and a CEMP will include pollution prevention and water management measures to protect the water environment; any likely impacts of the Proposed Development on water receptors is unlikely to give rise to significant effects. Therefore, there is no requirement to undertake further impact assessment for water resources.

Flood Consequence Assessment

13.20 SLR's Dragon LNG PV Farm Flood Consequence Assessment (FCA) provided an recent assessment of the flood risk to the site and concluded that the site is at "*very low risk of flooding from any potential sources.*"[90] SLR's Dragon LNG PV Farm FCA also concluded that the solar scheme would have a "*negligible effect on site runoff and drainage removing the requirement of a formal drainage strategy*."[90] Under the Technical Advice Note 15: Development And Flood Risk[97] (TAN15), Figure 2 both solar and wind developments are considered 'Less Vulnerable Developments' and, as per Section 9 of TAN15, are considered acceptable developments for flood zone A (the flood risk category of the site). Therefore, the Proposed Development (wind turbines within the solar array) is located on land with acceptable flood risk for the development type proposed.

13.21 It should be noted that in general, the potential for ground disturbance and therefore changes to runoff flow, is greater for solar developments than wind developments. By its nature, the need for widespread ground disturbance for turbines is limited with only confined land take for the turbine foundations and any auxiliary temporary hardstanding i.e. crane pads.

13.22 In addition, the Proposed Development design would consider Dragon LNG PV Farm temporary construction and any permanent drainage to ensure the Proposed Development's drainage is complementary to the Dragon LNG Solar Farm drainage and collectively they do not change the offsite flood risk.

13.23 Therefore, it is proposed that there is no requirement for further assessment of flood risk to the site. If required, an FCA would be provided for the Proposed Development in line with other legislative requirements.

Water Framework Directive Assessment

13.24 It is considered that a WFD assessment will not be required in support of the Proposed Development and is therefore proposed to be scoped out of the ES for the following reasons:

- The entirety of the site is located within the 'DrainToTRAC' surface water body and the 'Cleddau and Pembrokeshire' groundwater body. The 'DrainToTRAC' surface water body is not monitored under the WFD and the 'Cleddau and Pembrokeshire' groundwater body has an overall 'Poor' WFD status.
- Given the nature of the Proposed Development once operational, there will be very limited potential for adverse effects on the water environment to arise following the implementation of

[97] Welsh Assembly Government (2004) Planning Policy Wales. Technical Advice Note 15: Development And Flood Risk [online]. Accessed March 2022. Available at: https://gov.wales/sites/default/files/publications/2018-09/tan15-development-flood-risk.pdf

standard, best practice mitigation measures. During the construction and decommissioning phases of the project, adverse effects will be avoided or minimised through measures in a CEMP or equivalent (e.g., pollution prevention plan, sediment management plans and stand off from receptors). Therefore, any adverse effects from the Proposed Development can be mitigated and will not interfere with the waterbodies' objectives or its ability to maintain or achieve good WFD status.

- The objectives of the river basin management plan for the Western Wales River Basin District[98] are listed under a programme of measures implemented in order to meet the objectives of the WFD. Specifically, these focus on preventing a deterioration in the status of surface waters and groundwater and achieving 'good' status for all waterbodies. The Proposed Development is unlikely to affect the implementation or effectiveness of these measures.

13.25 In conclusion, it is proposed that the following information would be provided in support of the ES to the extent necessary to satisfy PCC and NRW's requirements. This information would be provided within an overarching CEMP provided as a technical appendix to the Project Description Chapter, including details of the following:

- Sustainable Drainage Management Principles, incorporating the proposed pollution prevention and environmental management systems to protect the water environment;
- Drainage principles to manage runoff during construction and following development of the Project;
- If any new watercrossings are required, a watercourse schedule. All new watercourse crossings will be designed to accommodate the critical 1 in 200 year return period storm event and aclimate change allowance; and
- Information on flood risk.

Key Questions for Consultees

13.26 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q13.1: Do the consultees agree that an impact assessment for water resources is not required, given that the Proposed Development would incorporate embedded mitigation within its design (e.g. any drainage being restricted to greenfield runoff rates taking into account the solar schemes drainage) and a

[98] Natural Resource Wales (2022) Western Wales River Basin Management Plan 2009-2015 [online]. Accessed February 2022. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/water-reports/river-basin-management-plans/western-wales-river-basin-management-plan/?lang=en

CEMP will include pollution prevention and water management measures to protect the water environment during construction?

- Q13.2: Do the consultees agree that flood consequent assessment (FCA) is not required as the site is located in Zone A with the turbines also being located in areas not at risk of flooding and is an appropriate development type for Zone A? In addition, the recent SLR (December 2021) Dragon LNG PV Farm Flood Consequence Assessment report has already considered the flood risk to the site and concluded that the site is at "very low risk of flooding from any potential sources."
- Q13.3: Do the consultees agree that a WFD assessment is not required given the Proposed Development would not affect WFD waterbodies or their ability to achieve 'good' WFD status?

14. AIR QUALITY – PROPOSED TO BE SCOPED OUT

14.1 This chapter of the Scoping Report considers the likely impact on air quality as a result of the Proposed Development.

14.2 The conclusion of this assessment it that this topic is proposed to be scoped out of further assessment in the Environmental Statement.

Baseline

14.3 The site is located within the administrative area of Pembrokeshire County Council (PCC), which is responsible for the management of local air quality. PCC has declared two air quality management areas (AQMAs) for exceedance of the annual mean objective for nitrogen dioxide (NO_2). These are located in Haverfordwest town centre and at Westgate Hill in Pembroke and are unlikely to be affected by the Proposed Development as neither are in proximity to the Proposed Development, nor are the proposed component delivery routes or construction traffic routes, as detailed below.. PCC monitors air quality by means of one automatic monitoring station and 45 non-automatic diffusion tubes across the administrative area. These are concentrated within and around the locations of the AQMAs.

14.4 In the absence of measured representative background pollutant concentrations being available for the local area, background concentrations have been obtained from the 2018-based default concentration maps provided by Defra on their LAQM webpages[99]. Background pollutant concentrations at the site are low, with mapped data for 2022 being 7.54 µg/m^3 of NO_2, 10.36 µg/m^3 of PM_{10} and 6.29 µg/m^3 of $PM_{2.5}$.

Key Sensitive Receptors

14.5 Given the location of the development, there are no highly sensitive human receptors within 350m of any construction activities (the distance to be considered in accordance with the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction' (February 2014). Workers at Dragon LNG adjacent to the site and workers during construction of the project are within this distance however their presence is short term and their sensitivity is considered to be less. The Milford Haven Waterway SSSI and Pembrokeshire Marine SAC are located adjacent to the site and are classified as medium to high sensitivity in terms of ecological designations sensitivity to dust, respectively.

[99] Department for Environment, Food and Rural Affairs, Local Air Quality Management webpages (http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html)

14.6 The IAQM & EPUK 'Land-Use Planning and Development Control: Planning for Air Quality' (January 2017) guidance document provides criteria for when a detailed assessment of development-related road traffic emissions is required. Outside of designated AQMA, should the development associated vehicle trip generation add an additional 500 LGVs or 100 HGVs to the road network, a detailed operational assessment is required.

14.7 The route for delivery of turbine components will be from Pembroke Docks via Western Way, London Road, A477, Scoveston Road, B4325 onto West Perimeter Road. Raw material delivery will come via the A40 to the east of Haverford West, A4076, A477, Scoveston Road, B4325 and onto West Perimeter Road. The number of construction vehicles using these roads will not meet the criteria above and form part of the normal traffic use on these roads. Therefore in accordance with the IAQM guidance, a detailed assessment of construction traffic emissions can be scoped out. Further to this, the Design Manual for Roads and Bridges (DMRB) LA 105 Air quality guidance states impact of construction traffic should only be assessed where they are planned for more than 2 years. It is anticipated the construction of the development will take 6 to 12 months, and therefore in accordance with DMRB impact of construction traffic can be scoped out. During operation, traffic generation associated with the development will be minimal.

14.8 Construction vehicles accessing the site via West Perimeter Road, will pass one sensitive receptor located in close proximity, Copybush Farm. Vehicles and plant associated with the construction of the development will also be in close proximity to The Milford Haven Waterway SSSI and Pembrokeshire Marine SAC. Although in accordance with the IAQM and DMRB the impact can be scoped out, it is best practice to still consider these receptors.

Evaluation and Impact Assessment

14.9 Implementation of mitigation including a CEMP and CTMP will ensure that construction vehicle management and good construction practice are carried out to minimise impact to the environment, in terms of air quality and dust impact. The CEMP and CTMP will include measures such as:

- All roads, temporary tracks, and other routes will be dampened to prevent dust leaving the site. Roads surrounding the site will be cleaned as necessary;
- Stockpiled material, where practicable will be enclosed, screened or dampened to eliminate dust;
- Hard surfaced roads will be constructed as soon as possible or at the earliest time that the build programme allows;

- Avoidance of activities that generate large amounts of dust during windy conditions;
- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport; and
- Limitation of vehicle speeds – the slower the vehicle speeds, the lower the dust generation.

14.10 The operation of the development will not introduce new air pollutant or dust emission sources to the area and therefore the impact is deemed to be negligible.

14.11 In terms of cumulative impact, the operation of the consented solar farm or other proposed developments in the locality, will not give rise to potential cumulative effects on local air quality. Implementation of the CEMP and CTMP will ensure that air emissions are minimised or controlled, and any cumulative effects will be negligible.

14.12 An indicative contents list for the CEMP can be found at **Figure 11**, **Appendix A**.

Potential Significant Effects

14.13 During construction, with the implementation of the CEMP, minor emissions will be localised and temporary and the impact is deemed to be negligible and no significant effects will occur. Construction vehicle management and good construction practice will be implemented to minimise impact to sensitive receptors and the environment, in consideration of both residential receptors and the designated ecological sites adjacent to the Proposed Development site.

14.14 During operation, the Proposed Development will not introduce new air pollutant or dust sources to the area and there will be limited vehicle exhaust releases from occasional maintenance visits to the site. Therefore, potential offsite impacts at residential receptors and the designated ecological sites will not be significant.

14.15 Overall it is concluded that no potentially significant effects on local residential or sensitive ecological receptors will arise, and it is proposed that air quality matters are scoped out of the EIA.

Key Questions for Consultees

14.16 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q14.1: Do the consultees agree that air quality can be scoped out of the EIA given the temporary impact during construction, which will be mitigated through a CEMP, and the negligible impact during operation, as the development will not introduce a new pollutant or dust source to the area?
- Q14.2: Do the consultees wish to add to the proposed air quality specific measures they would like to see in the CEMP and CTMP?
- Q14.3: Are the consultees content with and / or have any comments on the air quality baseline description based on Defra mapping, taking into consideration PCC's AQMA designations, current guidance, the proposed scale and location of the Proposed Development, and identified sensitive receptors?

15. AVIATION AND RADAR – PROPOSED TO BE SCOPED OUT DEPENDING ON CONSULTATION RESPONSES

15.1 This chapter of the Scoping Report considers the likely impact on aviation and radar as a result of the Proposed Development.

15.2 The conclusion of this assessment is that this topic is proposed to be scoped out of detailed assessment in the Environmental Statement unless objections are received as a result of consultation. The proposal is that a technical appendix is provided which details the results of consultation and, if necessary, any requirements for mitigation that can be secured through a DNS consent condition.

15.3 Wind turbines have the potential to affect civil and military aviation operations. The assessment of effects of the Development will be based upon the guidance laid down in the following publications:

- CAA Publication CAP 764 Policy and Guidelines on Wind Turbines, Version 6 dated February 2016;
- CAA Publication CAP 168 Licensing of Aerodromes, Version 11 dated March 2019;
- CAA Publication CAP 777 ATC Surveillance Minimum Altitude Charts in UK Airspace Policy and Design Criteria, Version 5 dated September 2018; and
- ICAO Procedures for Air Navigation Services, Aircraft Operations, Volume II Construction of Visual And Instrument Flight Procedures, Fifth Edition and NATS AIP (digital resource, various publication dates).

15.4 Consultation criteria for civil aviation stakeholders is defined in Chapter 4 of the CAP 764 document and the recommended distances include:

- Airfield with a surveillance radar – 30 km;
- Non radar licensed aerodrome with a runway of more than 1,100 m – 17 km;
- Non radar licensed aerodrome with a runway of less than 1,100 m – 5 km;
- Licensed aerodromes where the turbines would lie within airspace coincidental with any published Instrument Flight Procedure (IFP);
- Unlicensed aerodromes with runways of more than 800 m – 4 km;
- Unlicensed aerodromes with runways of less than 800 m – 3 km;
- Gliding sites – 10km; and

- Other aviation activity such as parachute sites and microlight sites within 3 km – in such instances developers are referred to appropriate organisations.

15.5 CAP 764 goes on to state that these distances are for guidance purposes only and do not represent ranges beyond which all wind turbine developments will be approved, or within which they will always be objected to. These ranges are intended as a prompt for further discussion between developers and aviation stakeholders, which will be reported upon in a technical appendix.

15.6 It is necessary to take into account the aviation and air defence activities of the Ministry of Defence (MOD) as safeguarded by the Defence Infrastructure Organisation (DIO). The types of issues that will be considered for inclusion in the Environmental Statement technical report include:

- MOD Airfields, both radar and non-radar equipped;
- MOD Air Defence Radars;
- MOD Meteorological Radars; and
- Military Low Flying.

15.7 It is necessary to take into account the possible effects of wind turbines upon the National Air Traffic Services En Route Ltd (NERL) communications, navigation and surveillance systems – a network of primary and secondary radars and navigation facilities around the country.

15.8 As well as examining the technical impact of wind turbines on Air Traffic Control (ATC) facilities, it is also necessary to consider the physical safeguarding of ATC operations using the criteria laid down in CAP 168 Licensing of Aerodromes to determine whether a Proposed Development will breach obstacle clearance criteria. This will also be reported on in a technical appendix.

15.9 Licenced Aerodromes - An initial review undertaken using the above criteria shows that there is one within 15 km of the Proposed Development. Haverfordwest Aerodrome is the nearest, approximately 14 km north of the Site. The results of an initial risk assessment indicate that the Proposed Development is low risk with respect to activity at this aerodrome. The Proposed Development lies outside the safeguarded area for Haverfordwest Aerodrome and does not infringe the Obstacle Limitation Surfaces (OLS). It is expected that there will be no objection to the Development from the safeguarding team at Haverfordwest Aerodrome; this will be confirmed through consultation and reported in an associated technical appendix.

15.10 MOD ATC Radars - the closest MOD ATC radar is the Manorbier PSR at the Manorbier Firing Range approximately 17 km to the east south-east of the Site. Initial radar modelling indicates that all three

proposed turbines are highly likely to be detectable to the PSR. The next closest MOD ATC radars are those associated with Hartland Point, over 83 km to the south south-east of the Site. Initial radar modelling again indicates that all three proposed turbines are highly likely to be detectable to these radars. The MOD's position on the Proposed Development will be confirmed through consultation, and this will be reported in a technical appendix.

15.11 The Site is located 140 km from the nearest MOD Tactical Training Area. Tactical Training Areas are highly valuable parts of the UK Low Flying System and are carefully monitored, managed and safeguarded by the MOD Low Flying Operations Squadron (LFOS) through DIO. To aid wind energy developers, LFOS publish a Low Flying/Wind Farm Safeguarding Map. The Map is colour coded Red, Amber, Blue and Green in descending order of Low Flying importance. It is unlikely training or low flying will be undertaken over the site and the location has a blue code for low flying importance. This means that the MOD anticipates the construction of wind turbines in this area is less likely to result in a concern due to their likely effect on the UK low flying system. However, anyone considering making applications for permission to erect turbines within these areas is still encouraged to liaise with the MOD before making any such applications.

15.12 NATS En Route Ltd (NERL) – The results of an initial risk assessment indicates that the only nearby NERL infrastructure is the Haverfordwest beacon which is approximately 15km away from the Proposed Development. The Proposed Development is therefore considered to be low risk with respect to NERL infrastructure. It is expected that there will be no NATS objection to the Proposed Development; this will be confirmed through consultation and reported in a technical appendix.

15.13 Met Office Radars – The Met Office safeguards its network of radars using a European methodology known as OPERA. In general it will object to any turbine within 5 km in line of sight and will examine the impact of any turbines within 20 km. Where a site is within 20 km, the Met Office will undertake an operational assessment based on three main criteria, having determined that there is a technical impact on the radar. The factors it will consider include the following:

- Proximity to Airports;
- River catchment response times; and
- Population density.

15.14 In this case the closest Met Office radar is Crug-y-Gorllwyn Weather Radar Station, located approximately 50km north-east of the Proposed Development. It is expected that there will be no Met Office radar objection to this Development; this will be confirmed through consultation and reported in a technical appendix.

15.15 Consultation with relevant aviation providers is a routine part of wind farm development and in accordance with CAP 764 consultees will include:

- Civil Aviation Authority (CAA);
- MOD DIO; and
- NERL.

15.16 Unlicensed Aerodromes – An initial search for private airfields has been conducted and one was identified within consultation distance (Rosemarket Airfield); however, not all private strips are listed in publications or marked on charts. Operators of any such private airstrips that are identified during Environmental Statement preparation will be consulted in accordance with CAP 764 CAP and CAP 793 Safe Operating Practices at Unlicensed Aerodromes. Based on the results of an initial risk assessment undertaken, the Proposed Development is not expected to have any significant effects on operations at unlicensed aerodromes. This will be confirmed in a technical appendix.

Conclusion

15.17 A review of aviation constraints likely to be affected by the Proposed Wind Turbines has ruled out any significant impacts on most primary radar stations, secondary radar stations, and weather radar stations, and thus effects on operational safety. The only assets which could be impacted comprise MoD ATC radars at the Manorbier Range and Hartland Point.

15.18 Developers are encouraged to engage with aviation organisations such as NATS, Civil Aviation Authority (CAA), Ministry of Defence (MoD), and airport operators at an early stage in the design process, to establish the potential impacts and agree acceptable technical solutions. Where actual or potential conflicts exist, it is important that a solution is identified and that the relevant consultee agrees to that solution being realised within a suitable timescale.

15.19 Further consultation will be carried out with the relevant consultees as part of the design process, and this will confirm further relevant details of the aviation and radar infrastructure. Where necessary, discussions will be undertaken with the relevant operators over the likelihood and practicalities of technical mitigation. On the basis that a technical mitigation solution is implemented, there would be no significant effects on aviation or defence. No further assessment is therefore required as part of the EIA process and a summary of the consultation will be presented in the EIA as technical report rather than a dedicated ES Chapter or detailed technical assessment.

Key Questions for Consultees

15.20 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q15.1: Do the consultees agree that aviation can be addressed through a technical appendix to the ES summarising consultation responses rather than as a dedicated ES chapter?

16. EXISTING INFRASTRUCTURE – PROPOSED TO BE SCOPED OUT

16.1 This chapter of the Scoping Report considers the likely impact on existing infrastructure such as fixed links and TV reception as a result of the Proposed Development.

16.2 The conclusion of this assessment it that this topic is proposed to be scoped out of detailed assessment in the Environmental Statement unless objections are received as a result of consultation. The proposal is that a technical appendix is provided which details the results of consultation and, if necessary, any requirements for mitigation that can be secured through a planning condition.

16.3 Wind farms have the potential to interfere with electro-magnetic signals passing above ground and physically with existing infrastructure below ground. This can therefore potentially affect television reception, fixed telecommunication links and other utilities. To identify any existing infrastructure constraints, a desk-based study as well as consultation will be conducted. Consultation with relevant telecommunication and utilities providers is a routine part of wind farm development and consultees will include:

- Television and telecommunications providers as appropriate;
- Water, gas and electricity utilities providers; and,
- Navigation aids and communications equipment used by the Port of Milford Haven.

16.4 The most relevant aspect in the context of potential restrictions/mitigation requirements for wind developments is the presence of wireless fixed links between radio antennae. Such links broadly fall into two categories. The first is 'microwave links', which provide high-frequency data transfer between antennae and are utilised by mobile phone operators and the emergency services to support their communications network. The second is Ultra High Frequency (UHF) links, which are utilised by operators including utility companies.

16.5 A secondary consideration is the impact upon terrestrial television signals which propagate from transmitters to receiving aerials which are in turn connected to television receiving equipment.

16.6 Wind turbines can cause interference to telecommunications infrastructure and terrestrial television signals in three ways, namely (1) As a physical structure that blocks/weakens the transmitted signal, reducing the strength of the coverage in the shadow zone. Losses in strength due to this mechanism are called 'diffraction losses', (2) The wind turbine blades intermittently 'chop' through the direct coverage path, causing fluctuations in received power, (3) The wind turbines can reflect the signal in an unwanted

direction, such that the same signal arrives twice at a receiving aerial with a time delay.

16.7 Both fixed telecommunication links and terrestrial television are considered within this section.

Assessment Methodology and Significance Criteria

16.8 With respect to telecommunications infrastructure, initial consultation has already been undertaken with MBNL, Vodafone, Arqiva, The Joint Radio Company (JRC), BT, and VirginMedia/O2 and it has been confirmed that no impacts will arise and no mitigation is required. At the time of writing responses are pending from Atkins on behalf of Dŵr Cymru Welsh Water and Airwave.

16.9 An initial meeting has also been held with the Port of Milford Haven Authority. This meeting indicated that no objections are expected in terms of the potential for impacts upon the visual navigation aids on the Site, or their associated telecommunications infrastructure, as a result of the wind turbine locations and heights specified at this scoping stage.

16.10 Should the remaining stakeholders raise an objection an assessment of the link or infrastructure will be carried out to determine whether there is an impact and its magnitude. The link 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 impact 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.

Potentially Significant Effects and Approach to Mitigation

16.11 For fixed telecommunications infrastructure, it is common practice for wind developers to assess potential impacts and, where necessary, mitigate them. It is extremely uncommon for wind developments to be blocked on the basis of telecommunications issues. This is largely because technical solutions generally exist and are commercially viable. The details of the infrastructure which crosses the Site has been confirmed through initial consultation and no impacts has been identified to date, indicating that impacts on telecommunications infrastructure should be scoped out. It is proposed that a technical assessment and summary of consultation responses therefore supports the ES.

Terrestrial television

16.12 A desk-based terrestrial television interference assessment has been carried and concludes that the overall television interference impact is expected to be low. This is due to several reasons:

- The relatively low number of potentially affected dwellings;
- The potential for alternative coverage from a different transmitter; and,
- The overall signal coverage for the area as a whole.

16.13 If interference is experienced then the most applicable mitigation is likely to be the installation of satellite television or re-orientation of the aerial to a non-affected transmitter.

16.14 Following the commencement of operation, it is good practice to monitor for any potentially affected dwellings for television interference which could, in turn, lead to a post-construction survey with the aim of investigating and mitigating any issues (as appropriate), and Dragon LNG will commit to undertake this monitoring.

16.15 Thus appropriate mitigation can be secured through a DNS consent condition.

Key Questions

16.16 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q16.1: Are consultees in agreement that this topic can be scoped out of detailed assessment in the ES and a summary provided as a technical appendix?

17. SHADOW FLICKER AND REFLECTIVITY – PROPOSED TO BE SCOPED OUT

Introduction

17.1 Reflectivity is the potential for the sun to 'glint' off structures which, in the case of wind turbines, can be an intermittent glint when the turbines are rotating. This effect can be minimised by selecting a matt coating for the wind turbines, designed to reduce the potential for reflection and the issue can therefore be scoped out of further assessment.

17.2 Rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun's rays. Under certain combinations of geographical position and time of day, the sun may pass behind the rotors of a wind turbine and cast a shadow over neighbouring properties. Shadow flicker is an effect that can occur when the shadow of a blade passes over a small opening (such as a window), briefly reducing the intensity of light within the room, and causing a flickering to be perceived. Shadow flicker effects only occur inside buildings where the blade casts a shadow across an entire window opening. It can be a cause of annoyance at residences near onshore wind turbines if it occurs for a significant period of time during the year, however no significant negative health effects are anticipated.

Assessment Methodology and Significance Criteria

17.3 Due to the lack of explicit guidance in Wales, guidance within England is considered to be material for assessing shadow flicker effects. Guidance produced by the UK Government, Planning Practice Guidance for Renewable and Low Carbon Energy[100] states that "*only properties within 130 degrees either side of north, relative to the turbines can be affected at these latitudes in the UK- turbines do not cast long shadows on their southern side*".

17.4 An assessment will be undertaken to determine whether or not there will be any shadow flicker effects on properties surrounding the Site. This assessment will examine all properties which lie within 10 rotor diameters and 130° either side of north from any of the proposed turbines. Effects will be quantified using a computer model during the EIA process and mitigation, if required, will be outlined.

17.5 There is no formal limit on the amount of shadow flicker that is considered acceptable within the UK. A typical limit, which has been utilised in Northern Ireland, Germany and Belgium, is 30 hours per

[100] DCLG (2013). Planning Practice Guidance for Renewable and Low Carbon Energy. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/225689/Planning_Practice_Guidance_for_Renewable_and_Low_Carbon_Energy.pdf [Accessed 01/03/2018]

year with a maximum of 30 minutes per day. If shadow flicker effects are predicted beyond this limit, mitigation may be required to eradicate the occurrence of shadow flicker.

Potentially Significant Effects and Approach to Mitigation

17.6 If shadow flicker effects are predicted beyond 30 hours per year and/or over 30 minutes per day, mitigation may be required. This is typically controlled by remote automatic wind turbine shutdown so that, in effect, no neighbouring property will experience the occurrence of shadow flicker beyond the limits specified above.

17.7 An initial assessment of the nearest 28 dwellings has confirmed that only one dwelling, Venn Farm, is likely to exceed the above limit and require mitigation (**Appendix B**). There are two approaches to mitigation which are complete removal of effects or reduction of any effects to the acceptable limit specified above.

17.8 A shutdown scheme defines the times between which a turbine should be shut down to eliminate shadow flicker effects on each receptor, assuming clear sunny skies. The term 'shutdown' means that the rotating blade is completely still and does not move for the period of time specified.

17.9 Shadow flicker effects can only occur under specific conditions so, in reality, turbine shutdown may not be required to eliminate effects i.e. shadow flicker cannot occur if the weather at the time of predicted effects is not clear and sunny or if the rotor is not face on to the receptor.

17.10 The significance of effects and mitigation requirement will be reported in a technical appendix to the ES.

Key Questions

17.11 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q17.1: Are consultees in agreement that this topic can be scoped out of consideration in an ES chapter, and provided as a technical appendix?

18. CLIMATE – PROPOSED TO BE SCOPED OUT

Introduction

18.1 The purpose of the Development will be to produce electricity from a renewable source, the wind, thereby displacing carbon dioxide (CO_2) and other greenhouse gas emissions that would occur through the production of the equivalent amount of electricity from fossil fuel sources.

18.2 The proposed wind turbines would provide renewable energy directly to the Dragon LNG facility. Dragon LNG decommissioned the site-based gas fired cogeneration plant in 2018, which significantly reduced pollutant emissions, but led to an increased reliance on the electricity grid for electrical power. The proposed wind development would replace a significant portion of that grid demand with a fully renewable supply and during periods of low site demand will export back into the electricity network.

18.3 Therefore, the Development is inherently designed to reduce adverse climate change effects by offsetting the production of carbon dioxide through use of renewable sources for generating electricity.

18.4 A proportionate approach to the assessment in relation to Climate is proposed related to both greenhouse gas emissions and the project's resilience and adaptation to climate change, as set out below.

Greenhouse Gas Emissions

18.5 Wind turbines generate electrical energy without producing waste or emissions. The Environmental Impact Assessment does not propose to carry out a life cycle analysis of greenhouse gas emissions associated with the development of the wind farm. Such an exercise is unlikely to be of any purpose as multiple scientific studies have shown that under normal conditions over its lifetime a wind turbine produces many times more energy (and hence associated greenhouse gas benefits) than was required for its production and the pay-back time is expected to be several years. The location and ground conditions at the Site are such that there is no peat on the Site and thus no risk of carbon emissions from peat disturbance.

18.6 It is proposed that the expected CO_2 savings will be presented in the scheme description chapter of the Environmental Statement with reference to relevant calculators and the candidate wind turbines.

The Development's Resilience and Adaptation to Climate Change

18.7 The latest climate projections for the UK are the 'UKCP18' projections provided by the UK Met Office Hadley Centre Climate Programme (UK Climate Projections, 2018b)[101]. Projected changes to the future climate include:

- warmer, wetter winters;
- hotter, drier summers: and
- more extreme weather events.

18.8 The wind turbines would have an operational life of up to 40 years which is relatively short when compared to the majority of large-scale infrastructure projects such as roads and reservoirs. However, the design of the wind farm itself and any associated mitigation, enhancement or compensation would aim to adapt to and / or be resilient to projected climate change within its operational life. A proportionate approach is proposed whereby the description of the development presented in the Environmental Statement will describe how adaption and resilience to climate change over the lifetime of the project has been embedded (based on the climate projections over land in the UK set out in UKCP18).

Key Questions

18.9 The following questions have been designed to ensure that the proposed methodologies and assessment are carried out in a robust manner and to the satisfaction of the determining authorities:

- Q18.1: Are consultees in agreement that this topic can be scoped out of detailed assessment in the ES?

[101] UK Climate Projections (2018b), Probabilistic Projections, UK Met Office, Crown Copyright. Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/key-results

19. PLANNING AND ENERGY POLICY

19.1 The application will be accompanied by a Planning Statement in support of the Development. The Planning Statement will consider the Development against identified planning and other policy objectives, concluding with substantiated comments about the extent to which the Development complies with the aims and objectives of identified plans and policies.

19.2 For clarity, the Planning Statement will draw upon the residual effects, post mitigation, of the Development identified in the various technical chapters of the Environmental Statement, in discussing the extent to which it complies with the aims and objectives of identified planning, energy and other relevant policy objectives.

19.3 In terms of the EIA, it is proposed that each specialist chapter will set out relevant policy to their specialism. The purpose of this chapter of the Scoping Report is to establish agreement on the main planning and energy related documents that should be considered by the Applicant in the EIA.

Planning and Energy Policy Context

19.4 In accordance with section 38(6) of the Planning and Compulsory Purchase Act 2004, this application should be determined in accordance with the Development Plan, unless material considerations indicate otherwise. Under Section 38(4) of the Act the Development Plan in Wales comprises the following:

- Future Wales: The National Plan 2040 which was adopted in February 2021 and is the national development plan for Wales. Key policies include:
    - Policy 17 (Renewable and Low Carbon Energy) which places 'significant weight' to schemes which help meet Wales's international commitments and their target to generate 70% of consumed electricity by renewable means by 2030.
    - Policy 18 which sets criteria for assessing low carbon and renewable development.
    - Policy 32 (Haven Waterway and Energy) that recognises the Waterway's location for potential new energy and low carbon related development, innovation and investment.
- Planning Policy Wales – which has been aligned with Future Wales and directs local planning authorities to assist in facilitating all forms of renewable development.
- The Local Development Plan (LDP). The LDP for Pembrokeshire, was adopted in February 2013, with relevant policy including:
    - SP1 Sustainable Development

- SP2 Port and Energy Related Developm
- GN1 General Development Policy
- GN2 Sustainable Design
- GN4 Resource efficiency and renewable and low carbon energy
- GN37 Protection and enhancement of biodiversity
- GN38 Protection of the Historic Environmentent

19.5 Other material considerations include:

- TAN 5 Nature Conservation and Planning
- TAN 8 Transport
- TAN 24 The Historic Environment
- Circular 6/96 Planning and Historic Environment: Historic Buildings and Conservation Areas
- PCC Biodiversity SPG
- PCC Historic Environment (Archaeology) SPG

Key Questions

19.6 The following question is designed to ensure that the proposed assessment is carried out in a robust manner and to the satisfaction of the determining authorities.

- Q19.1: Consultees are requested to confirm whether the above policy is relevant and whether other policy should also be considered.

20. RESPONDING TO THE SCOPING REPORT

20.1 One of the aims of this Scoping Report is to scope out any issues which are known not to be significant from further consideration and to highlight and focus on the main issues which should be assessed within the EIA.

20.2 The Scoping Report has identified the baseline resource at the site for different topics and presented where any effects to these may be experienced from the development (either indirectly or directly).

20.3 The responses provided by consultees will ensure that they too are in agreement, with the baseline and likely impact assessment so that the ES is focused. Where features or receptors are deemed to have a possible significant effect the methodologies to assess the impact have been provided for comment. Responses on these would help ensure that the detailed methodology, survey and assessment are carried out with consideration to all statutory consultees and key stakeholders. This approach is in line with good practice in the planning system and an emphasis being communicated at a national level to focus the content of the EIA and ES on key elements identified at the scoping stage.

20.4 In summary, the structure of the ES is to be as follows:

- Introduction
- Description of the site and its surroundings
- Details of alternatives considered and scheme evolution
- Description of the Development
- Details of the EIA process and methodology, including a summary of consultation
- Landscape and Visual
- Ecology
- Ornithology
- Historic Environment
- Noise
- Traffic and Transport
- Safety
- Summary of Mitigation

20.5 Where topics relate to human receptors and potential impacts to human health, these will be assessed and considered within the relevant technical chapters above, i.e., Noise, Traffic and Transport and Safety, as will any relevant mitigation in relation to these.

20.6 In summary, the key topics to be scoped out are as follows:

- Ground conditions and contamination
- Hydrology and Hydrogeology
- Air quality
- Aviation and radar – depending on consultee responses
- Existing Infrastructure – depending on consultee responses
- Shadow flicker and reflectivity – depending on consultee responses
- Climate
- Planning and energy policy – to be addressed within each specialist topic as necessary

APPENDIX A – FIGURES

APPENDIX B – SHADOW FLICKER IMPACT ASSESSMENT

APPENDIX C – BASELINE AND CUMULATIVE WIND FARMS

APPENDIX D – ECOLOGICAL AND ORNITHOLOGICAL SURVEY INFORMATION

Appendix D1	Bat Activity Survey Monitoring Period and Static Monitoring Station Information
Appendix D2	Extended Phase 1 Habitats Survey
Appendix D3	Ornithology Survey Methods and Key Findings
Appendix D4	**CONFIDENTIAL** - BSG Wear Point Wind Farm Extension, Baseline Ecological Report 2017-2019

Appendix D1

Bat Activity Survey Monitoring Period and Static Monitoring Station Information

Appendix D2

Extended Phase 1 Habitats Survey

Appendix D3

Ornithology Survey Methods and Key Findings

Appendix D4

CONFIDENTIAL - BSG Wear Point Wind Farm Extension, Baseline Ecological Report 2017-2019

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This document contains specific details in relation to a protected species. It should not be made freely available to the general public or photocopied and its use should be carefully logged with details of all reader(s) fully recorded.

Copies can be obtained from Avian Ecology Ltd. after the need for the information has been proven.

Contact Lydia Grubb, Avian Ecology (Lydia.Grubb@avianecology.co.uk)