

low intensity lighting (32 candela) installed on the turbine towers.

Night-Time Visualisations

5.97 Photographs will be taken in low light conditions from selected representative viewpoints. N1 is located within the Brecon Beacons Dark Sky Reserve whereas N2 is representative of the community within the settlement of Crynant (**Table 5.2** and **Figure 5.11a-b**).

5.98 According to NatureScot the photography should ideally be taken approximately 30 minutes after sunset and whilst other artificial lighting, such as street lights and building lights, are on.

5.99 Night-time visualisations will be presented in accordance with the industry standard guidance prescribed in SNH (now NatureScot)²⁴ and Landscape Institute²⁵ guidance.

Assessment Of Effects

5.100 Effects of the turbines' lighting on landscape character and visual amenity will be assessed using professional judgement of what the naked human eye can reasonably perceive in the context of the baseline situation with regard to existing sources of artificial lighting, supported by the lighting ZTV and visualisations.

Proposed Approach to Assessing Implications for Landscape Designations

5.101 Any implications for the published special qualities or the integrity of nationally designated landscapes within 28 km will be considered, as will implications for locally designated landscapes within 10 km. The Brecon Beacons National Park is also designated as an International Dark Sky Reserve and so the impact of lighting on the dark skies of the Park will also be a consideration.

Potential Significant Effects of the Development

Construction

Landscape Effects

5.102 Direct effects on the landscape resource relating to the construction of the Development on the Site as well as indirect effects on the landscape outside of the Site will be assessed.

Visual Effects

5.103 Visual effects arising from construction are temporary in nature and are unlikely to exceed the level of effect associated

with the operational visual effects and therefore will be scoped out of the assessment.

Operation

Landscape Effects

5.104 The following list summarises the potential landscape effects that will be scoped into the assessment:

- Direct effects on the landscape features and character of the Site.
- Indirect effects on the landscape character of the wider Study Area (10 km radius)- (including special qualities of locally designated landscapes).
- Indirect effects on the special qualities of the Brecon Beacons National Park and Dark Sky Reserve (not expected to be significant, but to be considered in the assessment) as well as other local landscape designations within 10 km with theoretical visibility.

Visual Effects

5.105 The following list summarises the potential visual effects that will be scoped into the assessment:

- Visual effects on people in individual properties / groups of properties within 2 km of the turbines (through the RVAA).
- Visual effects on local communities up to 15 km of the turbines.
- Visual effects on road and railway users up to 15 km of the turbines.
- Visual effects on recreational receptors within 15 km.
- Visual effects on promoted viewpoints and popular hill summits within 20 km (up to 28km within AONBs/ National Parks).

Decommissioning

5.106 At the end of the operational phase, the Development would either be decommissioned, its operational lifetime extended through another application, or the turbines would be replaced which again would require a new application. Decommissioning would involve the removal of all above ground infrastructure, including the turbines. Access tracks would likely remain in place; however, this is subject to conversations with the landowners. Decommissioning effects

²⁴ Visual Representation of Wind Farms Guidance - Version 2.2. (February 2017) Scottish Natural Heritage

²⁵ Technical Guidance Note 06/19 Visual Representation of Development Proposals (September 2019)

are not predicted to be significant – refer to **Effects Scoped Out**.

Effects Scoped Out

5.107 On the basis of the work undertaken to date, the professional judgement of the assessment team and experience from similar projects, it is proposed that the following effects are scoped out:

- Effects on landscape character beyond the reporting units (10 km radius) shown on **Figure 5.3**.
- Effects on visual receptors beyond 28 km.
- Effects on receptors outside the visual envelope (as indicated by the ZTV) of the Development.
- Effects of decommissioning the Development at the end of its operational life.
- Cumulative effects arising from turbines over 15 km from the Development.
- Cumulative landscape and visual effects during construction and indirect effects on landscape designations.

Approach to Mitigation

5.108 The key principle for the mitigation of landscape and visual effects of the Development will be the iterative design of the turbine layout and their associated infrastructure, especially when assessed from key viewpoints.

5.109 The aim from a landscape and visual perspective will be to:

- Locate turbines in the large-scale elevated plateau as far as possible where landscape scale is larger, avoiding the valley landscapes.
- Set turbines back from the steep breaks of slope.
- Minimise intrusion of turbines into views from settlements in the valleys.
- Achieve as consistent a height and spacing as feasible (in light of other constraints), to achieve a well-balanced composition overall.
- Ensure no turbine is too dominant or overwhelming in the main view from a property, such that it could result in unacceptable living conditions.
- Design tracks to utilise existing tracks where possible and keep them away from highly visible slopes where possible.
- Sensitive design borrow pits to minimise visibility.

- Nacelle lights to be controlled by visibility sensors in order to reduce the intensity of the lights to approximately 10% of the minimum peak intensity in times of clear meteorological conditions (where visibility exceeds 5 km), which will substantially reduce the perceptibility of the proposed nacelle lights.
- Follow an agreed 'Construction Method Statement' and 'Construction Environmental Management Plan' which will include arrangements for implementation of various aspects of the works. The statement will also set out restoration of landscape earthworks, soils and surface vegetation e.g. alongside tracks, around turbine bases, around borrow pits, and along cable routes once the construction phase is complete.

Questions

Question 5.1: Is the proposed approach and scope for the assessment of effects on landscape character and LANDMAP aspect areas / Landscape Character Areas considered to be appropriate? [NB can NRW provide the information required to enable us to complete the Stage 2 filtering process for Geological Landscape aspect areas i.e. data needs to provide a match between the Site IDs in the GIS data and the online survey records].

Question 5.2: Is the proposed approach and scope for the assessment of effects on designated landscapes considered to be appropriate?

Question 5.3: Is the proposed approach and scope for the assessment of visual effects appropriate?

Question 5.4: Do consultees consider that the proposed viewpoints are appropriate to inform the visual assessment, and that the suggested presentation of visualisations is appropriate?

Question 5.5: Is the approach to inclusion of schemes within the cumulative assessment appropriate?

Question 5.6: Is the approach to the assessment of effects on residential visual amenity appropriate?

Question 5.7: Do consultees consider the effects to be scoped in and out appropriate?

Question 5.8: Is the approach to the aviation lighting assessment and night-time photography appropriate and proportionate, and are the suggested night-time viewpoints appropriate?

Question 5.9: Are there any other relevant parties who should be included within the post-scoping consultation process for the LVIA?

Chapter 6

Cultural Heritage

Introduction

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

6.2 This chapter has been prepared by Headland Archaeology.

6.3 *"The historic environment comprises all the surviving physical elements of previous human activity and illustrates how past generations have shaped the world around us. The historic environment is made up of individual historic features which are collectively known as historic assets"*²⁶. A historic asset can be a building, monument, site, place, archaeological remains, townscape or landscape. Some historic assets are designated as Registered Historic Landscapes, Scheduled Monuments, Listed Buildings, World Heritage Sites, Conservation Areas, Historic Parks and Gardens, Battlefields, or 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 derive some, or all, of their interest from their 'setting' within the wider landscape.

6.4 The purpose of the assessment will be to identify the potential direct effects of the Development on the historic environment and changes to the cultural significance of assets through impacts on their setting.

6.5 It is important to note that, 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.

²⁶ Planning Policy Wales 11 available at https://gov.wales/sites/default/files/publications/2021-02/planning-policy-wales-edition-11_0.pdf

Existing Conditions

Information Sources

6.6 The following sources of information have been reviewed during the initial desk-based research for this Scoping Report and will be considered in the assessment:

- Cadw data on designated historic assets downloaded as a digital data extract on 14 March 2022 from “DataMapWales”²⁷, Welsh Government’s GeoPortal for Wales.
- Glamorgan Gwent Archaeological Trust (GGAT) Historic Environment Record (HER) data on non-designated historic assets within 1 km of the Site supplied as a digital data extract on 29th July 2022²⁸.
- Information on conservation areas within 5 km of the Site obtained from NPTCBC²⁹.

The Site and its Immediate Surroundings

6.7 The Site contains three designated historic assets and 23 assets recorded by the GGAT HER. The designated historic assets comprise three Scheduled Monuments – a prehistoric cairn, medieval settlement remains and a Roman signal station. The non-designated historic assets comprise 12 boundary markers, a reservoir, old coal levels, a ford, a sheepfold a tramroad with quarry, three Bronze Age cairns and a Roman road which runs alongside the Site’s eastern boundary. These assets are shown on **Figure 6.1**.

6.8 Within 1 km of the Site there is one further Scheduled cairn, one Grade II* and three Grade II Listed Buildings as well as 45 further assets recorded by the GGAT HER, these are also shown on **Figure 6.1**. The Grade II* Listed Building is a 19th century chapel, the Grade II Listed Buildings comprise another chapel, a bridge and a circular latrine. The non-designated assets are mainly post-medieval features recorded from mapping but also include a Bronze Age cairnfield.

6.9 Within 2 km of the Site there are a further nine Listed Buildings (six Grade II* and three Grade II), no Scheduled Monuments, and a Registered Park (Rheola) which includes two Registered Gardens within its boundary (a garden and a kitchen garden). These assets are shown on **Figure 6.2**.

6.10 The Grade II* Listed Buildings comprise one country house (Rheola House) which sits within the Registered Park, and five structures associated with the Cefn Coed Colliery, the Grade II Listed Buildings are a 17th century farmhouse, the walls of a barn associated with this farmhouse and the pump house at Cefn Coed Colliery.

6.11 Within 5 km of the Site there are a further 53 Listed Buildings - four Grade II* (two sections of canal aqueduct and two chapels) and the rest Grade II:

- five agricultural buildings
- two commemorative monuments
- one commercial building
- five industrial structures
- four chapels
- the gates, railings and churchyard wall to a church
- four aqueducts
- four milestones
- eleven bridges
- a canal lock
- a culvert
- ten houses or domestic structures

6.12 There are also a further 16 Scheduled Monuments within 5 km of the Site:

- four prehistoric ritual, religious or funerary monuments
- two Roman forts
- a pair of medieval house platforms
- five industrial structures
- a canal lock
- an aqueduct
- a tramroad
- a WWII Auxiliary Unit Operational Base

6.13 There are also two conservation areas within 5 km of the Site – Cilybebyll and Glynneath Woollen Mill (**Figure 6.2**).

6.14 Within 10 km of the Site there is one Grade I Listed Building and a further 14 Grade II*, and 183 Grade II Listed Buildings. There are 49 Scheduled Monuments, and a further four Registered Parks. The closest Registered Historic Landscape extends to within 10 km of the Site. The locations of these are all shown on **Figure 6.3**.

6.15 The Grade I Listed Building is a theatre, the Grade II* Listed Buildings comprise:

- six churches
- a chapel

²⁷ <https://datamap.gov.wales/>

²⁸ GGAT HER Enquiry 6855

²⁹ <https://www.homipi.co.uk/conservation-areas/neath-port-talbot/>

- two sections of an aqueduct
- two blast furnaces
- the medieval Neath Castle
- a country house
- a cow-house

6.16 The Grade II Listed Buildings comprise:

- 46 transport structures
- two aqueducts
- 29 religious buildings (churches, chapels and associated structures as well as a Friend's Meeting House)
- three recreational buildings
- two institutional buildings (a Masonic Temple and a former workmen's institute)
- 14 industrial buildings/ structures
- two libraries
- a town hall
- five features within parks or gardens
- a school
- 28 commercial buildings
- three commemorative structures
- a bridge
- a viaduct
- a Mission Hall
- ten agricultural buildings
- 34 domestic buildings

6.17 This spread of building types reflects the largely urban nature of the Outer Study Area.

6.18 There are no World Heritage Sites or Designated Wrecks within 20 km of the Site. The distribution of Listed Building and Scheduled Monument types between 10 km and 20 km of the Site reflects the pattern within 10 km of the Site.

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

6.19 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

6.20 The assessment will comply with Welsh legislative and planning policy frameworks and apply Cadw's relevant guidance to ensure the EIA is undertaken in a robust manner.

Legislation

6.21 The assessment will be carried out with reference to the following legislation:

- The Historic Environment (Wales) Act 2016³⁰ as the primary statutory tool for protecting historic assets and sustainable management of the historic environment in Wales.
- Ancient Monuments and Archaeological Areas Act 1979³¹ as amended by Historic Environment (Wales) Act 2016.
- Planning (Listed Buildings and Conservation Areas) Act³² 1990 as amended by Historic Environment (Wales) Act 2016 and the Planning (Listed Buildings and Conservation Areas (Wales) Regulations 2012³³.

Policy

6.22 The assessment will be carried out with reference to the following policies:

- Planning Policy Wales Edition 11, February 2021 (PPW).
- Neath Port Talbot County Borough Council LDP: OB 2, OB 23 and OB 24.

Guidance

6.23 The assessment will be carried out with reference to the following guidance:

- Technical Advice Note 24: The Historic Environment (May 2017)³⁴.

³⁰ Historic Environment (Wales) Act 2016 available at <https://www.legislation.gov.uk/anaw/2016/4/contents>

³¹ Ancient Monuments and Archaeological Areas Act 1979 available at <https://www.legislation.gov.uk/ukpga/1979/46#:~:text=An%20Act%20to%20consolidate%20and,to%20provide%20for%20the%20recovery>

³² Planning (Listed Buildings and Conservation Areas) Act 1990 available at <https://www.legislation.gov.uk/ukpga/1990/9/contents>

³³ The Planning (Listed Buildings and Conservation Areas) (Wales) Regulations 2012 available at <https://www.legislation.gov.uk/wsi/2012/793/contents/made>

³⁴ Available online from: <https://gov.wales/technical-advice-note-tan-24-historic-environment>

- Cadw guidance documents: Heritage Impact Assessment in Wales (May 2017)³⁵ and the Setting of Historic Assets in Wales (2017)³⁶.
- Cadw's Conservation Principles (March 2011)³⁷.
- Natural Resources Wales (NRW) Guide to using the Register of Landscapes of Historic Interest³⁸.
- Standard and Guidance for Historic Environment Desk-Based Assessment (Chartered Institute for Archaeologists (CifA 2020))³⁹.
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (CifA 2020)⁴⁰.
- Glamorgan-Gwent Archaeological Trust (GGAT) standards and guidance for archaeological work⁴¹.

Proposed Study Area

6.24 Two study areas are proposed for the assessment in order to focus the assessment on likely significant effects:

- Inner Study Area (ISA) this will equate to the Site and will be used to identify known and potential historic assets that may experience direct construction phase effects.
- Outer Study Area (OSA), this will extend up to 20 km from the Site. Within this area historic assets will be considered based on their importance and distance from the Site as follows in order to focus the assessment on likely significant effects
 - Up to 2 km from the Site: all designated historic assets and non-designated historic assets for which the wider setting makes a positive contribution to their significance and there is theoretical intervisibility with the Development based on the ZTV.
 - Up to 5 km from the Site: all Scheduled Monuments, Listed Buildings, Registered Parks and Gardens and Conservation Areas (there are no World Heritage Sites, Designated Wrecks or Registered Historic Landscapes within 5 km of the Site) where there is theoretical intervisibility with the Development based on the ZTV.
 - Up to 20 km from the Site based on the ZTV: designated historic assets which derive significance from particular long range views of, from or including

the asset that may be sensitive to change. This is likely to include Registered Parks and Gardens as they are likely to include designed views, country houses which may be associated with registered or unregistered designed landscapes, large churches as they may form landmarks in the surrounding landscape, and regional scale defensive sites such as large castles and hillforts which may have dominated substantial areas and could be expected to be highly visible in the wider landscape.

Proposed Desk Study

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

6.26 The distribution of known archaeology in the surrounding area indicates that previously unidentified archaeological remains pre-dating the 19th century are most likely to be found on gentle slopes, plateau areas, sheltered fertile land and/or close to the principal watercourses. At present, the ISA is considered to be of Medium archaeological potential, although this may change during the assessment process.

6.27 A full archaeological desk-based assessment (DBA) covering a 1 km study area around the Site will be carried out in accordance with a Written Scheme of Investigation (WSI) which will be submitted to GGAT for approval. This will identify all known historic assets within the Site and will seek to identify areas of archaeological potential for consideration within the EIA.

6.28 The following sources will be consulted in preparing this assessment:

- Designated historic asset GI data from Cadw.
- Descriptions of designated historic assets and assets recorded in the GGAT HER and the National Monuments Record Wales (NMRW).
- Archaeological records held by GGAT HER & supplemented by RCAHMW records where available.
- Conservation Area details from NPTCBC.
- Natural Resources Wales (NRW) LiDAR data.

³⁵ Available online from: <https://cadw.gov.wales/sites/default/files/2019-05/20170531Heritage%20Impact%20Assessment%20in%20Wales%2026917%20EN.pdf>

³⁶ Available online from: <https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf>

³⁷ Available online from: https://cadw.gov.wales/sites/default/files/2019-05/Conservation_Principles%20for%20the%20sustainable%20management%20of%20the%20historic%20environment%20of%20Wales.pdf

³⁸ Available online from: https://cadw.gov.wales/sites/default/files/2019-05/LandscapesRegisterGoodPractice_EN_0.pdf

³⁹ Available online from:

https://www.archaeologists.net/sites/default/files/CifAS%26GDBA_4.pdf

⁴⁰ Available online from:

https://www.archaeologists.net/sites/default/files/CifAS%26GCommissioning_2.pdf

⁴¹ Available online from: www.ggat.org.uk

- LANDMAP datasets.
- Maps and plans held in the Glamorgan Archives and Gwent Archives.
- Relevant internet sources including National Library of Wales.
- Aerial photos held by the Central Register for Aerial Photography Wales (CRAPW) and the RCAHMW.
- Readily available published sources and unpublished archaeological reports.

6.29 Any limitations as a result of inaccessibility of sources will be discussed in the ES.

6.30 LANDMAP data will be used to undertake a high-level assessment using NRW guidance to consider historic landscape context and extent. Especially where they overlap with Registered Historic Landscapes and to assist with the understanding of landscape character and potential effects upon it.

6.31 A Stage 1 setting assessment following Cadw guidance will be carried out for all historic assets within the Site, and on designated historic assets within the OSA. This will identify those asset types for which the Development may result in potentially harmful changes within their setting and will inform the scope of the detailed assessment of setting which will be included within the EIA.

Proposed Field Surveys

6.32 A walkover of the Site will be carried out following baseline data gathering for the DBA. This will seek to confirm the location and state of preservation of previously recorded assets within the Site, confirm the nature of any features detected in LiDAR survey (if data is available for the Site), and will seek to identify currently unrecorded archaeological remains.

6.33 Historic assets within the OSA which the Stage 1 desk-based study identifies as potentially drawing significance from their wider setting will be viewed from publicly accessible locations to confirm their baseline setting and to identify locations for visualisations to assist with the assessment of impacts in the EIA.

6.34 Subsequent detailed setting assessment visits to assets identified (through the above stages of assessment) as potentially experiencing significant effects will also be carried out following design freeze and receipt of wireline visualisations in order to more fully assess potential impacts.

Consultation

6.35 Pre-application advice and consultation will be sought from the following consultees regarding the scope and extent of cultural heritage and archaeology assessment as part of the EIA. This will include consultation and agreement of viewpoint photography locations.

- Cadw.
- Glamorgan-Gwent Archaeological Trust (GGAT).
- NPTCBC's Conservation Officer.

6.36 Consultation bodies will also be contacted to discuss any potential mitigation on completion of the draft ES.

Assessment Methodology

Assessment of Heritage Significance

6.37 Analysis of 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 Wales⁴² (section 4.2) and Conservation Principles⁴³ 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 6.1: Levels of Heritage Importance

Importance of the Asset	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 landscapes with exceptional coherence, time depth or other critical factor(s).
High	Scheduled monuments and non-designated assets of schedulable quality and importance; Grade I and II* Listed Buildings and Grade II Listed buildings that can be shown to have exceptional qualities in their fabric or associations; Protected Wreck Sites; Registered Battlefields; Grade I and II*

⁴² Cadw 2017 Heritage Impact Assessment in Wales

⁴³ Cadw 2011 Conservation Principles for the sustainable management of the historic environment in Wales

Importance of the Asset	Criteria
	Registered Parks and Gardens. Conservation Areas containing very important buildings or with other exceptional qualities; 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	Grade II Listed Buildings, Grade II Registered Parks and Gardens, non-designated assets that contribute to regional research objectives; Locally listed buildings (historic unlisted buildings) that have exceptional qualities; Conservation Areas.
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. Negligible or no heritage significance.
Unknown	Further information is required to assess the potential of these sites

Assessment of Potential Effects

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

6.39 Direct and indirect effects potentially physically alter an asset and therefore its heritage significance.

6.40 Effects upon setting alter the heritage significance of an asset by causing visual or sensory change within its setting affecting the ability to understand, experience or appreciate the asset's cultural significance. Application of Cadw's 'Managing Setting of Historic Assets in Wales' will require a four-stage process in the assessment of setting effects:

- Stage 1: Identify the Historic Assets.

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

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

6.42 An effect may be beneficial or adverse where for example, as part of the 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.

6.43 Effects could 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 effect on our ability to interpret it, or its context.

6.44 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 using the criteria in the following table.

Table 6.2: Magnitude of Impact

Magnitude	Summary
High beneficial	Elements of the asset's physical fabric which would otherwise be lost, severely compromising its heritage significance, are preserved in situ; or Elements of the asset's setting, which were previously lost or unintelligible, are restored, greatly enhancing its heritage significance.
Medium beneficial	Elements of the asset's physical fabric which would otherwise be lost, leading to an appreciable but partial loss of heritage significance, are preserved in situ; or Elements of the asset's setting are considerably improved, appreciably enhancing its heritage significance; or Research and recording leads to a considerable enhancement to the archaeological or historical interest of the asset.

Magnitude	Summary
Low beneficial	Elements of the asset's physical fabric which would otherwise be lost, leading to a slight loss of heritage significance, are preserved in situ; or Elements of the asset's setting are improved, slightly enhancing its heritage significance; or Research and recording leads to a slight enhancement to the archaeological or historical interest of the asset.
Neutral/None	The asset's fabric and/or setting is changed in ways which do not beneficially or adversely affect its heritage significance.
Low Adverse	Elements of the asset's fabric and/or setting which are of very limited relevance to its significance are lost or changed, resulting in a very slight loss of heritage significance; or Elements of the asset's fabric and/or setting which contribute to its significance are affected, but to a limited extent, resulting in an appreciable but partial loss of the asset's heritage significance.
Medium adverse	Elements of the asset's fabric and/or setting which contribute to its significance are affected, but to a limited extent, resulting in an appreciable but partial loss of the asset's heritage significance.
High adverse	Key elements of the asset's fabric and/or setting are lost or fundamentally altered, such that the asset's heritage significance is lost or severely compromised.

Assessment of Significance of Effect

6.45 The assessment will assess the potential for direct impacts on historic assets within the Site from construction activities. Within the OSA, the assessment would be focussed on designated historic assets that, following the filtering process (Stage 1 setting assessment), are considered to have potential for visual change to affect cultural significance.

6.46 The assessment of effects will combine analysis of the data gathered during the DBA and site visit, photographs and wireline visualisations, and viewpoint photography of the topography and 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). The following locations are proposed for viewpoint photography in addition to those suggested in **Table 5.2** of **Chapter 5** (Landscape and Visual Amenity), if the ZTV predicts visibility of the Development:

- Coed-du Ring Cairn Scheduled Monument (GM592) and Coed-du house platforms (GM593).
- Roman signal station earthwork (GM274).
- Rheola, Grade II* Listed Building, Grade II Registered Park and Garden.
- The Gnoll, Grade II* Registered Park and Garden.

6.47 Additional viewpoints (initially wirelines only) will also be used in the assessment of effects on the rural churches and chapels where the ZTV indicates theoretic visibility from locations where these are appreciated. These are:

- Church of Saint Cadoc (11867).
- Sardis Independent Chapel (23032).
- Godre'r Rhos Independent Chapel and vestry (23080).
- Jerusalem Independent Chapel (23082).
- Melincwrt Independent Chapel (23083).
- Bethel Independent Chapel (23086).
- Wern Independent Chapel (23087).
- Chapel of east to Church of St Margaret (82547).

6.48 These assessments will be carried out using professional judgement, taking into account designations and heritage significance as assessed against national standards.

6.49 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 (incorporating contribution from setting where relevant) to establish the likely significance of effect. The significance of effect matrix is presented in **Table 6.3**.

6.50 Effects of Major or Moderate significance are considered to be significant effects in the context of the EIA Regulations; those of Minor or Negligible significance are considered not to be significant but will be described in the assessment. Where **Table 6.3** provides two possible options for the significance of effect this will be a matter of professional judgement, taking into account the relative importance and heritage significance of the asset, the magnitude of effect and the reversibility or otherwise of this.

Table 6.1: Significance of Effect

Magnitude of effect	Heritage Importance					
	Very high	High	Medium	Low	Negligible	
High beneficial	Major	Major	Major or moderate	Moderate or minor	Minor or negligible	Enhancement
Medium beneficial	Major	Major or moderate	Moderate or minor	Minor	Minor or negligible	
Low beneficial	Major or moderate	Moderate or minor	Minor	Negligible	Negligible	
Neutral/ None	Negligible	Negligible	Negligible	Negligible	Negligible	Neutral/ Nil
Low adverse	Major or moderate	Moderate or minor	Minor	Negligible	Negligible	Harm
Medium adverse	Major	Major or moderate	Moderate or minor	Minor	Minor or negligible	
High adverse	Major	Major	Major or moderate	Moderate or minor	Minor or negligible	

Key:
Orange: significant effects with orange
Yellow: potentially significant effects

Cumulative Assessment Methodology

6.51 Cumulative effects on the significance of historic assets may occur where the Development results in a residual effect on the significance of a historic asset of higher than Negligible effect and other developments also have an effect on the same asset.

6.52 It is proposed that:

- Single turbines below 20 m in height be excluded from the assessment of cumulative effects.
- Single turbines between 20 m and 50 m in height within 5 km of the Site are included.
- Single turbines over 50 m in height within 10 km and all wind farms within 20 km will be considered for cumulative effects.
- Wind farms or single turbines beyond 20 km will be excluded from the assessment.

6.53 This approach is proposed in order to focus the assessment on potentially significant cumulative interactions. It is not considered that domestic scale, single turbines below 20 m at any range or those less than 50 m height to tip beyond 5

km from the Site will have the potential to result in significant cumulative interactions.

Potential Significant Effects of the Development

6.54 Potential significant effects of the Development can arise from direct or indirect physical effects during construction or from changes to the setting of historic assets during operation. Indirect or secondary effects can also arise during operation.

- Direct physical effects describe those development activities that directly cause damage to the fabric of a heritage asset. Typically, these activities are related to construction works and will only occur within the site of the asset.
- An effect on the setting of a heritage asset occurs when the presence of a development changes the surroundings of a heritage asset in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual changes are most commonly encountered but other environmental factors such as noise, light or air quality can be relevant in some cases. Effects 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.

- Indirect effects describe secondary processes, triggered by the development, that lead to the degradation or preservation of heritage 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.

6.55 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 Development as a whole.

Effects Scoped Out

6.56 It is not proposed that cultural heritage issues in general would be scoped out, but where for example the “bare earth” ZTV indicates no visibility of the Development from a historic asset or from areas where the asset’s significance can be appreciated, this would allow the asset to be scoped out early in the assessment process. All such instances where a historic asset is scoped out of further assessment will be clearly explained within the ES.

6.57 Most of the Listed Buildings over 5 km from the Site are within built up areas and are not expected to draw significance from long range views, these urban buildings will therefore be scoped out of the assessment.

6.58 The smaller structures such as the mileposts, commemorative monuments, and a latrine are not considered to draw significance from their wider landscape setting and are therefore proposed to be scoped out of the assessment. The bridges, aqueducts and viaducts will draw significance from their relationship with the transport network and relevant watercourse which will be unaffected by the Development, it is therefore proposed to scope these out of the assessment. The rural churches and chapels are typically not prominent buildings in the wider landscape and are therefore unlikely to experience significant effects from the Development being visible in their settings however all of these assets will be scoped into the assessment due to their proximity to the Development.

6.59 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.

Approach to Mitigation

6.60 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 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 effects upon the historic environment are identified, measures to prevent, reduce and/or where possible offset these will be proposed.

6.61 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 heritage assets during construction works. Effects which cannot be eliminated in these ways would lead to residual effects.

6.62 Adverse effects resulting from physical harm to 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 GGAT. 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 but as direct physical impacts to historic assets are irreversible the magnitude of effect is not reduced by this off-setting.

6.63 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.
- Appropriate archiving and publication of findings.

6.64 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 Development but can be offset through more general enhancement measures (though this will not reduce the overall level of effect).

Questions

Question 6.1: Do consultees agree with the scope and approach of the Cultural Heritage and Archaeology Assessment?

Question 6.2: Are consultees happy with the proposed viewpoints for consideration in the cultural heritage assessment?

Chapter 7

Hydrology, Hydrogeology and Geology (including Peat & Mining)

Introduction

7.1 This chapter sets out the proposed approach to the assessment of potential significant effects on hydrology, hydrogeology, geology of the Development. The assessment will be undertaken by Wallingford HydroSolutions with inputs from Yellow Sub Geo.

Existing Conditions

Information Sources

7.2 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Topographical information at the Site is provided by OS mapping and LiDAR data⁴⁴.
- Designated nature and conservation sites have been identified using information from NRW's mapping database.
- Solid and superficial geology information is provided by British Geological Survey (BGS) mapping and the UK Soil Observatory Map viewer.
- Flood risk at the Site is indicated by the Natural Resources Wales (NRW) online flood maps.⁴⁵
- Information pertaining to water quality at and near the Site is given by NRW river basin management plans, NRW Water Watch Wales map gallery and Cycle 3 rivers and waterbodies mapping.

The Site and its Immediate Surroundings

Surface Hydrology, Site Drainage and Flooding

7.3 Most of the Site lies within the Dulais Valley and drains into the Dulais (headwater to confluence with River Neath). The Site encompasses the Hirfynydd Ridge which forms the watershed between the catchments of the Rivers Neath and Dulais. Consequently, some of the Site lies within the Neath catchment and will drain into the Neath (confluence with Nedd Fechan and Mellte). These catchments are shown in **Figure 7.1**.

⁴⁴ <http://lle.gov.wales/GridProducts#data=LidarCompositeDataset>

⁴⁵ <https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en>

7.4 There is one pond at the western side of the Site and a small un-named lake/pond outside offsite, south of the village of Crynant.

7.5 NRW online fluvial flood maps⁴⁶ (**Figure 7.2**) shows minimal Site flooding occurring on the far southern edge of the Site alongside the boundary.

7.6 NRW pluvial mapping (**Figure 7.2**) indicates some pluvial flood risk onsite. Three unnamed rivers within the site boundary, running north to south, indicate flood risks for 1.0% Annual Exceedance Probability (AEP), 0.1%AEP and 3.3%AEP flood events. These all drain into the Dulais (headwater to confluence with River Neath).

7.7 The pluvial flood map, combined with topography data, indicates most of the Site drains south-west, towards the village of Crynant.

7.8 Based on EA flood data⁴⁷, there is no evidence of historic flood risk in the vicinity of the Site. It is important to note that this does not mean the Site has never flooded, but that NRW has no records of it.

7.9 The Site is located 14 km from the sea and at a minimum height of approximately 200 m, therefore the risk of coastal flooding is considered to be insignificant.

Geology, Hydrogeology and Soils

7.10 Substantial sections of the southern and eastern extent of the Site have no BGS⁴⁸ data available in-terms of their superficial makeup. The BGS mapping does show that the Site contains areas of till and Devensian around its centre with peat located to the south and north-west.

7.11 According to findings from the ES for a previous wind farm at this location⁴⁹, as much as 30% of the Site could have a superficial peat layer, as well as sporadic peat bogs being found in the northern area of the Site and surrounding the unnamed tributaries.

7.12 A Phase 1 Peat probing survey has been conducted across the Site, with results mapped in **Figure 7.3**. The results show the west of the Site is largely free of major peat deposits (generally shallow soils underlain by clay); however, there is a band of relatively deep peat through the centre of the Site, running north to south. This is largely constrained to areas between and adjacent to the two watercourses at this location, draining east to west.

7.13 Bedrock conditions found within the Site are primarily limestone with bands of mudstone and sandstone.

7.14 The Rhondda sandstone, found within the Site, is known to contain well-developed systems which transfer water into aquifers. Consequently, infiltration rates are expected to be good. Information gathered from a previous site visit⁵⁰ indicates the northern extent of the Site has better drainage while the southern sections of the Site are characterised by slow draining, boggy ditches. As the area has a history of mining (refer to sub-section Land Use and Designated Sites, below) it is possible that this activity will have altered the hydrogeology, causing tension or compression on the near surface strata and altering drainage pathways.

7.15 The Site lies within an area of historic coal mining activity which ceased in 1995. Coal seams are known to outcrop/sub-crop at the Site with workings extending to between 350 m and 700 m depth. The Coal Authority and BGS also note that coal is present at or close to the surface which places areas of the Site in 'Development High Risk' zones. Due to the likelihood of coal at or close to the surface, it is considered possible that the Site may also be affected by areas of unrecorded workings (i.e. those that were undertaken prior to the legal obligation to lodge abandonment plans in the mid-1800s).

7.16 Much of the Site is underlain by the active Aberpergwm coal mine which operates from a surface drift entrance to the west of Glynneath. The mine is working the 9 ft seam with an estimated in-situ resource of 70 million tonnes of anthracite.

Land Use and Designated Sites

7.17 The Site is located on-top of the hill to the east of Crynant. Consequently the Site slopes gently downwards on its Western extent and flattens out towards the northern side. On the northmost edge of the Site, steep escarpments are present on its north-west, sloping towards the Dulais Valley, and south-east side sloping towards the Vale of Neath.

7.18 The Site is mostly dominated by open grassland used for animal agriculture. This is contrasted by the sections of peat and bogland resulting from the onsite pond and unnamed watercourses. There are also some small sections of scrubland.

7.19 There are no nationally or internationally designated sites⁵¹ present within the Site. The nearest SSSI is the Nant y Rhos SSSI situated approximately 1.5 km to the north-west of the Site.

Water Quality and Water Use

7.20 Most of the Site drains into the Dulais catchment, draining to the west of the Site. This catchment has a good overall

⁴⁶ <https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en>

⁴⁷ <https://environment.data.gov.uk/spatialdata/historic-flood-map/wms>

⁴⁸ <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/>

⁴⁹ Acciona Energy UK Ltd. 2007. Hirfynydd Wind Farm Environmental Statement.

⁵⁰ Acciona Energy UK Ltd 2007 *Hirfynydd Wind Farm* 121203-00

⁵¹ <https://waterwatchwales.naturalresourceswales.gov.uk/en/index.html>

status, as identified by the Water Framework Directive (WFD) 2021⁵².

7.21 A small section of the eastern extent of the Site drains into the Neath Catchment, which has a moderate WFD rating as of 2021.

7.22 No existing boreholes have been identified onsite, however data from BGS GeoIndex Onshore⁵³ surrounding the Site is available, which will be obtained and used to inform the baseline for the Site.

7.23 The aquifer underlying the Site is rated as being “moderately productive”⁵⁴ with the groundwater flow virtually all being through fractures and other discontinuities. Groundwater quality is reasonable, but poor surrounding old mine working. Previous hydrological and hydrogeological baseline work associated with the Aberpergwm Mine indicates that limited groundwater ingress has been encountered. Where groundwater ingress is noted, this is collected locally (underground) and passes through primary settlement tanks before being ‘lifted’ into old workings for secondary settlement and finally the surface where it discharges into a network of lagoons for tertiary settlement and treatment prior to discharge to the Nant Ysgwrfa under a discharge permit from NRW.

Private Water Supplies

7.24 The previous ES assessment undertook a review of the private water supplies both onsite and in proximity to the Site. Coed Du, the farm to the west of the Site, has a private water supply with water also being collected from various streams and from a series of ponds. The site of Gelli-benuchel is derelict and no longer in use. To obtain further information, an information request has been sent to NPTCBC to request any information it holds on private water supplies within a 6 km radius of the Site and a response is awaited.

7.25 The need for an information request for private water supplies from Powys Council has been scoped out from the assessment, since any properties within this Local Authority boundary would be at a too distant from the Site, on the other side of the Dulais Valley and within a different catchment.

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

7.26 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

Legislation

7.27 The following legislation will be taken into consideration for the hydrology, hydrogeology, geology ES chapter:

- The Water Environment Regulations 2017.
- Flood and Water Management Act 2010.
- Water Act 2014.
- Water Resources Act 1991.
- The Groundwater Directions 2016.
- Pollution Prevention and Control (England and Wales) Regulations 2000.
- Water Supply (Water Quality) Regulations 2018.
- Private Water Supplies (Wales) Regulations 2017.
- The Coal Industry Act, 1994.
- The Coal Mining Subsidence Act, 1991.

Policy

7.28 The following policy will be taken into consideration for the hydrology, hydrogeology and geology ES chapter:

- Planning Policy Wales (Edition 11) 2021 and accompanying Technical Advice Notes (TAN).
- Future Wales: the National Plan 2021.
- TAN15 Development and Flood Risk 2004.
- Planning Policy Wales 11 (incorporating Minerals Planning Policy Wales), 2021.
- Mining Technical Advice Note 2 (MTAN 2), 2009.

Guidance

7.29 The following guidance will be taken into consideration for the hydrology, hydrogeology, geology, peat and mining chapter of the ES.

- Relevant Guidance for Pollution Prevention (GPP).
- Woodlands for Wales Woodlands and trees, and Water and Soils Guidelines (Welsh Government, 2018).
- Groundwater Protection: Principles and Practices 2012.
- Assessing the impact of windfarm developments on peatlands in Wales (CCW, 2010).
- Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments (2nd Edition) (Scottish Government,

⁵² <https://waterwatchwales.naturalresourceswales.gov.uk/en/index.html>

⁵³ <https://mapapps2.bgs.ac.uk/geoindex/home.html>

⁵⁴ <https://mangomap.com/land-information/maps/54498/groundwater-productivity-uk#>

2017) (in the absence of Welsh guidance this Scottish guidance will be adhered to).

- Developments on Peatland: Guidance on the assessment of peat volumes, reuse of excavated peat and the minimisation of waste (Scottish Renewables and SEPA, 2012).
- Risk Based Approach to Development Management in the Coalfields, The Coal Authority, 2010.
- Abandoned Mine Working Manual, CIRIA, 2019.

Proposed Study Area

7.30 Impacts upon water quality will be considered on a catchment basis. The catchments draining the Site are presented in **Figure 7.1**.

7.31 Flood risk will be considered within the Site and to third parties offsite as far as any flood modelling suggests any impacts may occur. It is assumed that information provided by NRW models and online mapping is sufficient for this assessment and that no additional flood modelling is required.

7.32 Impacts upon private water supplies (PWS) will be considered based upon likely flow paths from infrastructure on the Site, considering both surface water and groundwater pathways. The catchments will be defined following the confirmation of PWS source locations.

7.33 Impacts on peat will be considered over the full Development area, including on adjacent peatlands where these are hydrologically connected to peat deposits within the Site. The extent of peat has been determined from the results of the Phase 1 probing survey shown in **Figure 7.3**.

Proposed Desk Study

7.34 A comprehensive desk-based study will form the base of the assessment. A range of publicly available sources of information will be used to assess the conditions of the baseline environment and its subsequent sensitivity to the Development. The following baseline conditions will be determined through a desk study:

- Geology, hydrogeology and soils of the Site and sub-catchments (no groundwater monitoring programme is required prior to submission of the application).
- Details of designated and protected areas within the drainage pathways of the Site.
- Watercourses within the Site and within a 300 m radius of the Site (as detailed on Ordnance Survey 1:10,000 mapping) will be identified and located, in addition to existing and potential watercourse crossings, artificial and/or natural drainage pathways.

- The quality and condition of the watercourses within the Site and sub-catchments will be obtained from NRW, where available.
- Flow characteristics of the catchments draining to/from the Site, as any reduction in baseflows or a change in the magnitude and frequency of flood peaks in the watercourses as a result of the Development are critical issues with regards to flood risk, water supplies and aquatic ecology.
- The location and nature of public and PWS abstractions within the Site and sub-catchments, recognised by local authorities and NRW. This information will be tabulated and mapped, including all available information, including accessibility and details of supply. Questionnaires will also be issued to properties in proximity to the Site, to confirm PWS supply information. Catchment areas for supplies will be considered relative to infrastructure plans and any possible interactions.
- A Phase 1 ground conditions desk study will be undertaken and provided as a technical appendix to the ES.

Proposed Field Surveys

7.35 A phased approach to peat surveys will be undertaken in order to characterise the depth and variability of peat deposits across the Site. The Phase 1 probing results will be used to inform the initial layout design and detailed infrastructure-specific Phase 2 probing will be undertaken following the initial design to fully characterise the design-freeze layout.

7.36 An NVC survey will be undertaken as input to the Groundwater Dependent Terrestrial Ecosystems (GWDTE) assessment - see **Chapter 8: Ecology** for more details on the surveys to be undertaken.

7.37 Peatland geomorphological walkover surveys will be undertaken to establish the presence and condition of natural peatland features (e.g. hagged areas, gullies, flushes) and identify potential opportunities for peatland restoration alongside the Development. Geomorphological observations will be coordinated with the findings of habitat surveys to identify the current baseline and potential target habitats.

7.38 Visits will be made to any properties identified within the desk-based assessment in the vicinity of the Site which may possess a PWS and where communication/ required information relating to PWS cannot be collected via mail or information requests.

7.39 Where an access track requires crossing of a watercourse, a preliminary survey will be made of the watercourse at the intended crossing point, to assess flow conditions, channel type and to determine the best method for the crossing in order to

minimise impacts upon the natural regime of the watercourse. Surveys of watercourses will be undertaken where there are planned track crossings, following design freeze.

7.40 A geomorphological walkover of the Site will be undertaken to identify any evidence of ground movement/subsidence.

Consultation

7.41 Early engagement with NRW's peatland technical advisors will be sought for this application.

7.42 A data request has already been made to NPTCBC to obtain information relating to PWS in the area.

7.43 Consultation will be undertaken with the Coal Authority and Energy Build Ltd in relation to gathering information for the mining assessment.

Assessment Methodology

7.44 Assessments of impacts will be based on initial desk-based studies in respect of early-stage designs of the Development. An iterative design process will be utilised where potential impacts to hydrology, hydrogeology, geology and peat are identified. These early design changes will help reduce the residual effects on the water environment.

7.45 Further site visits, consultation, data processing and analysis will then take place using later stage designs of the Development, and where impacts cannot be avoided, mitigatory actions to compensate for effects will be made.

7.46 A peat management plan (PMP) and peat landslide hazard risk assessment (PLHRA) will be produced using the results from peat depth surveys carried out onsite and included as appendices to the ES.

7.47 The PMP will identify potential peat excavation volumes during construction of the Development. This plan will look to direct infrastructure away from deeper peat, as far as possible, and where peat excavation is required, opportunities for reuse of peat will be explored, potentially in combination with habitat creation proposals. Detailed calculations for excavation and reuse of peat will be provided through this process.

7.48 The PLHRA will assess the likelihood and consequences of peat instability relating to the Development's construction and operation. This will be carried out with reference to Scottish Government guidance in the absence of Welsh guidance⁵⁵. The assessment will be made at an early stage following initial site design, using peat depth survey results to assess risks associated with location of infrastructure. Potential receptors will also be assessed to produce overall risk categorisation.

Mitigation measures and good practice recommendations will also be made, to minimise risks.

7.49 A Watercourse Crossing Assessment will be produced to assess the impact of new crossing points within the Site upon the water environment and included as an appendix to the ES.

7.50 A Carbon Balance Assessment will also be produced, to calculate the amount of offsetting from release of carbon from the peatland through construction of the Site, by the lifecycle carbon savings accrued from the proposed development. This calculation will be made using the Scottish Government Carbon Calculator⁵⁶. The results of the carbon calculator will be presented in the Development description chapter and the detail presented in an appendix to the ES.

7.51 The ES will also include a technical appendix assessing the impact of existing mining activity on the Development. The mining appendix will include:

- Coal mining risk assessment (CMRA) focussing on historic coal mining. Including a review of historic OS mapping and aerial imagery coverage, review of Coal Authority data including available mine entry data and abandonment plans, review of results of the walkover survey. This will result in a preliminary risk assessment in accordance with Coal Authority requirements with recommendations.
- Review and assessment of the active Aberpergwm mine plans and documents in the context of the Site. This will include consideration of depth to the active mine workings, working type, potential surface settlement (as provided by the mine operator, Energy Build), life of the mine in the context of the proposed Development and proposed future restoration plans.
- Preliminary cumulative CMRA. This will bring together the historical and contemporary data including potential influence of Development High Risk Areas to empirically consider potential surface subsidence of infrastructure and outline mitigation options to remove and/or mitigate this for the life of the proposed Development.
- An assessment of potential hydrological and hydrogeological impacts as a result of subsidence mitigation works including the potential for discrete mine working voids beneath proposed turbines.

7.52 The technical appendix will not seek to assess the significance of effect of ground stability as this is outside the scope of the ES. Instead it will provide a technical assessment to inform the planning decision.

⁵⁵ Scottish Government (2017) Peat Landslide Hazard and Risk Assessments, Best Practice Guide for Proposed Electricity Generation Developments

⁵⁶ Scottish Government/ (2022). Carbon Calculator Tool v1.6.1.

Significance of Effects

7.53 The significance of effects will be determined through a standard method of assessment based on professional judgement, guidance documents and best practice documents, taking account of three key factors:

- Sensitivity of the receiving environment.
- Potential magnitude of the effect.
- Probability of the effect occurring.

7.54 The sensitivity of the hydrological, geological and hydrogeological receptors will be defined separately in the assessment on a scale of high, medium and low. The magnitude of effect on each receptor will be defined taking into account factors such as timing, scale, size and duration of the effect and will use a scale of major, moderate, minor and negligible. Probability of occurrence will be evaluated as being high as being high ($\geq 50\%$), medium ($< 50\%$ and $\geq 20\%$) or low ($< 20\%$) during the phase of work being assessed.

7.55 Significance of effect will be determined through a combination of the above three factors, using professional judgement. Moderate and major effects will be considered to be significant in EIA terms.

7.56 The assessment of effects will assume that good practice regulatory measures will be implemented. Where, even with the application of such good practice measures, a significant effect is still predicted, and it cannot be avoided by design, additional location specific mitigation will be identified in order that the residual effects are acceptable and not significant.

Cumulative Assessment Methodology

7.57 The cumulative effects of developments within the local area will be assessed on a catchment basis. The size of the draining catchments and the proximity to current or other proposed developments will be assessed to determine the likely cumulative impacts on the local environment.

Potential Significant Effects of the Development

Construction

7.58 An outline CEMP will be prepared and submitted as part of the ES. The delivery of the CEMP will ensure that good practice pollution prevention and control measures are put in place during construction. These will be embedded into the project design and will reflect best practice guidance and recognised industry standards. The CEMP will detail the relevant policies to be followed and ensure these are put in place. These will include but not be limited to the GPPs, CIRIA

SUDS Manual and Control of Water Pollution from Construction Sites Guidance.

7.59 The ES will expand upon the hydrological, geological and hydrogeological potential impacts identified within this scoping report to identify what receptors are likely to be significantly affected by the Development and other cumulative schemes in the area and to what extent.

7.60 Excavation of peat to accommodate infrastructure may affect peatland habitats, the soil carbon store and the stability of adjacent deposits, the latter having potential knock-on impacts on water quality and habitats. The effects in relation to peat, both direct and indirect will be assessed in the ES and further detail will be provided in a Peat Management Plan, which will be submitted as a technical appendix to the ES.

7.61 The location of GWDTE will be identified through field surveys (as described above) and an assessment will be made on the effects in relation to water resource. Mitigation measures will be proposed to reduce any dewatering effects of these habitats. Potential effects on GWDTE in relation to water quality are proposed to be scoped out, as discussed below.

7.62 Construction activities have the potential to alter the water quality and/or resource of private water supplies. Acknowledging the fact that additional information on the location of potential private water supplies is required, the effect on these receptors is not proposed to be scoped out. The chapter will assess the direct and indirect effects on private water supplies during the construction period. In addition, a Private Water Supply Risk Assessment (PWSRA) will be undertaken and appended to the ES as a technical appendix.

Operation

7.63 The operation of the Development will involve maintenance activities and require access for maintenance vehicles. There is the potential that these activities could result in pollution incidents which in turn could affect the water environment. An operational pollution prevention plan will be implemented to ensure any incidents are correctly and quickly dealt with such that no impact on the water environment will occur.

7.64 The design of the Development will ensure that drainage will be maintained throughout its lifetime, such that long term effects on PWS, GWDTE and peatland habitats will not occur. The design considerations will include cross track drainage to ensure that the wetting of the upslope side of the track and drying of the downslope side will not occur. The tracks and cable trenches have the potential to provide a preferential route for water, altering its natural course. Clay plugs will be utilised at appropriate intervals within the cable trenches to stop water flowing through them and to reduce the drying out of habitats.

7.65 With the submission of the Flood Consequence Assessment (FCA) and drainage strategy, it is considered that long term changes in flood risk will not occur.

Effects Scoped Out

7.66 On the basis that the Site is located 14 km from the coastline and at some substantial elevation above sea level, it is proposed that tidal flood risk is scoped out of the ES.

7.67 Third party flood risk will be scoped out during both construction and operation based upon the relatively small increase in impermeable area relative to the catchment size. A FCA be produced for the Site in line with TAN15 requirements and will be submitted with the ES.

7.68 It is proposed to scope out construction and operation effects whereby receptors are outside the drainage pathways of the Site, or are not hydrologically linked to construction works i.e. PWS, GWDTEs etc. This will be determined once design freeze of the proposed Development is reached.

7.69 No direct effects on geological resources and their integrity are considered likely and therefore direct effects on geological resources are scoped out.

7.70 There is no evidence of contamination recorded within the Site and therefore contaminated land effects are proposed to be scoped out of the ES.

7.71 With the implementation of the CEMP (including details of best practice measures to prevent pollution), water quality impacts during construction can be reduced such that they would not be significant. Mitigation measures will be proposed for any works within proximity to watercourses for the construction of crossings and will be presented in the watercourse crossing assessment. Therefore, water quality effects from the construction of crossings would not be significant. The effects on water quality during construction can thus be scoped out of the ES.

7.72 Mitigation to reduce sediment generation from concentrated runoff points and maintain hydrological connectivity through operation, will be provided through careful site design.

7.73 Measures to be included within an operation pollution prevention plan will also be provided in the ES which will control long term water quality effects from erosion and maintenance activities. The assessment will be conducted taking this into account, thus water quality effects from operation of the Site are also proposed to be scoped out. Further details of long-term water quality monitoring and emergency response plans will also be provided in the ES.

7.74 As described above, the design of the Development will ensure that long term changes to the groundwater movement will not occur and as such no significant effects on water

resources for GWDTE, PWS and peatland habitats are likely to occur. Therefore, all aspects of operational effects on the water environment are proposed to be scoped out of the ES.

7.75 Effects from decommissioning of the Site are assumed to be no worse than for construction, therefore there is no need for an additional full assessment. In addition, decommissioning activities would be covered by the development and implementation of a Decommissioning Environmental Management Plan, which would be designed to comply with the relevant legislation and guidance applicable at the point of decommissioning and agreed with consultees.

Approach to Mitigation

7.76 Impacts would be avoided as far as possible through the design process, and where this is not possible appropriate mitigation measures would be implemented to ensure potential impacts are minimised. A hierarchy of mitigation strategies will be devised following best practice guidelines including the PPGs, the WFD, and relevant NRW policies.

7.77 Mitigation measures will include appropriate drainage design (an outline drainage plan will be developed for the Site), the use of runoff and sediment control measures where necessary and through the implementation of good working practice. The use of specific mitigation measures will be specified for every potential significant effect identified in the ES.

7.78 The use of appropriate mitigation measures, where deemed necessary, will reduce the potential impacts on receptors from the Development. It is anticipated that all potentially significant effects can be mitigated via such measures to ensure there are no significant residual effects. The requirement for surface water quality and groundwater baseline, construction and post-construction monitoring will be agreed with NRW where required.

Questions

Question 7.1: Is the proposed assessment methodology appropriate?

Question 7.2: Are the proposed list of effects which are scoped in appropriate?

Question 7.3: Is the use of the Scottish Government Carbon Calculator acceptable?

Chapter 8

Ecology

Introduction

8.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the Development on ecological features. Ornithological effects are considered separately in **Chapter 9**.

8.2 This chapter has been prepared by BSG Ecology.

Existing Conditions

Information Sources

8.3 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Publicly accessible online aerial imagery and Ordnance Survey mapping⁵⁷.
- Previous ecological survey data for the Site, collected during 2006 and 2007 inclusive⁵⁸.
- The UK Government's 'Magic' website⁵⁹ (in Wales this is principally of use in locating statutory designated sites of nature conservation importance).
- Data held by South-East Wales Biodiversity Records Centre (SEWBReC). Ecological data for protected or otherwise notable species and non-statutory sites for nature conservation within 2 km of the Site have been secured. This area has been extended to 10 km for bats.

The Site and its Immediate Surroundings

8.4 The Site comprises unenclosed sheep grazed upland moorland and pasture, with a strip of patchy young-growth commercial conifer plantation separating a smaller area of moorland to the north-west from the main area to the south-east. Several streams rise within the Site and flow west across a shallow basin in the larger south-eastern area, towards the Afon Dulais.

8.5 The surrounding land is characterised by coniferous plantation woodland (managed by Natural Resources Wales - NRW) and further unenclosed moorland. To the west, the land

⁵⁷ <https://wtp2.appspot.com/wheresthepath.htm>

⁵⁸ Ove Arup & Partners (2007) Hirfynydd Wind Farm. Environmental Statement: Volume 1. Chapter 7: Ecology. Acciona Energy UK Ltd

⁵⁹ [MAGIC \(defra.gov.uk\)](https://magic.defra.gov.uk/)

drops steeply away towards Crynant. Smaller fields, pockets of deciduous woodland, pools and residential dwellings are features of the lower ground.

8.6 There is one statutory designated site within 2 km of the Site: Nant-y-Rhos SSSI located approximately 1.9 km to the north-west (see **Figure 8.1**). This site is notified for its species-rich fen meadow habitat.

8.7 There are 11 Sites of Importance for Nature Conservation (SINC) within 2 km, including Sarn Helen SINC which covers part of the Site (see **Figure 8.1**). This SINC is a composite designation covering six areas along the Sarn Helen Roman Road. Interest features are a range of upland habitats including dry heath, acid grassland, blanket bog and ffridd (upland fringe).

8.8 The streams within the Site are included under a blanket SINC designation which covers all watercourses within the NPTCBC authority boundary (therefore, this SINC has not been presented on the figure).

8.9 The remaining SINC's are a mixture of grassland and woodland sites and are a considerable distance from the Site boundary (>800 m) and therefore unlikely to be subject to direct impacts arising from the Development.

8.10 Desk study data obtained from the South-East Wales Biodiversity Records Centre (SEWBReC) included records of:

- Five species of bat, including noctule *Nyctalus noctula*, serotine *Eptesicus serotinus*, brown long-eared *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *P. pygmaeus* along with several records of unidentified species.
- One offsite record of otter *Lutra lutra*.

8.11 No records of dormouse *Muscardinus avellanarius*, great crested newt *Triturus cristatus*, water vole *Arvicola amphibius*, or reptiles were presented in the data search results.

8.12 The results of the survey work completed to date are presented under the sub-section **Survey Results** (below).

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

8.13 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

Legislation

8.14 Consideration has been given to the following in deriving the detailed approach to the work:

- Habitats and species listed under Annexes 1 and 2 of the Habitats Directive (92/43/EEC).
- Schedules 5, 8 and 9 of the Wildlife and Countryside Act 1981 (as amended).
- Section 7 of the Environment Wales Act (2016).

Policy

8.15 Consideration will be given to national and local policy, to include:

- Planning Policy Wales (PPW) 11.
- Technical Advice Note (TAN) 5 Nature Conservation and Planning.
- Future Wales (The National Plan 2040).
- The Neath Port Talbot Council (NPTC) Local Development Plan (LDP).

Guidance

8.16 The approach to the collection of ecological data will be based on industry standard guidance wherever this is available and applicable to the Site. For example, the updated Phase 1 habitat survey will be completed in accordance with the approach outlined by JNCC (2010)⁶⁰, bat survey and dormouse survey will follow SNH *et al.*, 2021⁶¹ and Bright *et al.*, 2006⁶² respectively, and otter and water vole survey will be based on the approaches outlined by Chanin (2003)⁶³ and Dean *et al.* (2016)⁶⁴.

8.17 The approach to the ecological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance⁶⁵.

⁶⁰ Joint Nature Conservation Committee. (2010). Guidelines for extended phase 1 habitat survey. JNCC. Peterborough.

⁶¹ Scottish Natural Heritage. Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT). (2021). *Bats and onshore wind turbines: survey, assessment and mitigation*. SNH, Inverness.

⁶² Bright, P., Morris, P. & Mitchell-Jones, T. (2006). *The dormouse conservation handbook*. Natural England, Peterborough.

⁶³ Chanin, P. (2003). *Monitoring the otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.

⁶⁴ Dean, M., Strachan, R., Gow, D & Andrews, R. (2016). *The water vole mitigation handbook*. Eds Fiona Matthews and Paul Chanin, The Mammal Society, London.

⁶⁵ CIEEM. (2018). *Guidelines for ecological impact assessment in the UK and Ireland*. CIEEM, Winchester.

Proposed Study Area

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

8.19 Ecological survey work will be largely focused onsite. However, for some species, such as great crested newt *Triturus cristatus*, suitable habitat beyond the Site has been considered.

Proposed Desk Study

8.20 The desk study to date has comprised review of:

- Aerial imagery and mapping (including mapping of designated sites).
- Ecological records from previous survey work at the Site (in 2006 and 2007).
- Ecological records secured from SEWBRcC.

Field Surveys

8.21 The scope and specification of ecological surveys is as follows:

- A Phase 1 Habitat Survey of eastern part of the Site was completed in May 2021 - the extent of the 2021 Phase 1 habitat survey is shown on **Figure 8.2**. The western part of the Site (which was added to encompass the proposed solar PV panels in early 2022) was surveyed in August 2022. All survey work was completed in accordance with industry standard (JNCC, 2010) survey guidance. Plant communities were assigned to National Vegetation Classification (NVC) categories in the field (based on the experience of surveyors) and subsequently checked against community types identified by Rodwell (1998)⁶⁶.
- Bat activity surveys were completed in 2021 using static acoustic bat detectors in accordance with industry standard guidance (SNH *et al.* 2021). This involved the seasonal deployment of six SM4 full spectrum detectors at potential turbine locations (based on the 2021 working turbine layout) for a minimum of ten nights during spring, summer and autumn. A weather station was deployed for the duration of the survey work, to collect site-specific meteorological data. Following the addition of a seventh proposed turbine in early 2022, two bat detectors have been deployed in spring and summer 2022: one at the additional turbine location, and the second at a location previously sampled in 2021 (to provide a control). The

detectors will be deployed again in Autumn 2022. The location of bat detectors is shown on **Figure 8.3**)

- Bat roost surveys of trees and buildings within a 1 km perimeter area around proposed turbines were undertaken in 2022. Dusk emergence surveys were carried out on one building onsite identified as having suitability to support roosting bats. Close inspection of one tree was also undertaken in accordance with BCT (2016) survey guidance. The location of the surveyed building and tree is shown on **Figure 8.3**.
- Great crested newt (GCN) eDNA survey of five ponds was completed in spring 2022. The eDNA sample collection visit was combined with a night-time torch survey as a complementary technique to supplement the eDNA results. The locations of ponds are shown on **Figure 8.3**.
- Dormouse *Muscardinus avellanarius* survey was initiated in summer 2022, with survey visits commencing in the autumn and continuing in 2023. Areas of the Site's access track (between the Site and the A4109 with broadleaved woodland and scrub habitats) will be targeted for sampling (refer to **Figure 11.1** for the proposed route to Site).
- Otter *Lutra lutra* and water vole *Arvicola amphibius*. Surveys of watercourses within 200 m of proposed turbine locations and the Site's access were completed in 2021, and additional surveys within 200 m of the proposed solar PV footprint undertaken in 2022. The watercourses surveyed are shown on **Figure 8.3**. Two visits were completed in both survey years.
- A habitat suitability survey for adder *Vipera berus* was completed in early summer 2022. This was undertaken due to the likelihood that adder will become fully protected if / when the Quinquennial Review of the Wildlife and Countryside Act 1981 is implemented⁶⁷. The work was completed by a national expert.

Survey Results

8.22 The 2021 Phase 1 habitat survey identified the presence of Annex 1 (dry heath) and Section 7 (Environment Wales Act, 2016) priority habitats (marshy grassland and acid flush) and potential groundwater dependent terrestrial ecosystems (GWDTEs) on the Site.

8.23 Bat survey work completed onsite in 2021 resulted in the collection of 180 nights of data from 6 static detector locations

⁶⁶ Rodwell, J.S. (1998). *British plant communities*. Cambridge University Press, Cambridge.

⁶⁷ The other species for which targeted survey was undertaken (bats, great crested newt, dormouse, otter and water vole) have established legislative

protection which makes understanding presence / likely absence and, in some cases, population size, important.

(one at each of proposed turbine locations 1 to 6). An additional 60 nights of data will be collected from 2 detectors in 2022.

8.24 The survey in 2021 demonstrated a low-level use of the Site by bats. The most frequently recorded were common pipistrelle *Pipistrellus pipistrellus* (with an overall pass rate of 0.5 passes per hour), which are likely to roost around farms and in residential buildings in the wider area. This is also reflected in the emerging results of the 2022 survey work. A roost of a small number of common pipistrelle (two bats) was recorded in the derelict barn at Gelli-benuchel, onsite.

8.25 Bats in the genus *Myotis* were also recorded regularly, with a peak in activity (of 0.8 passes per hour) during the autumn sampling period. Noctule *Nyctalus noctula* occurred very infrequently (five passes were recorded in the summer sample period). One pass of Nathusius' pipistrelle *Pipistrellus nathusii* and four passes of greater horseshoe bat *Rhinolophus ferrumequinum* were also recorded during the summer recording period. Other species (soprano pipistrelle *Pipistrellus pygmaeus*, long-eared bats *Plecotus* sp., and bats that could not be identified to species level⁶⁸) were recorded at a rate of less than 0.1 passes per hour.

8.26 eDNA survey of ponds concluded a negative result for great crested newt. Palmate newt *Lissotriton helveticus*, common frog *Rana temporaria* and common toad *Bufo bufo* were recorded during the torch survey.

8.27 Evidence of water vole presence (droppings and feeding remains) has been recorded in the western part of the Site near Coed Du.

8.28 Several areas of suitable habitat for adder have been identified within and near to the Site. However, common lizard has been the only species of reptile recorded onsite to date.

Consultation

8.29 Consultation with NRW and NPTCBC is proposed. A request for a discretionary advice service (DAS) meeting with NRW was issued in December 2021. However, a suitable date for a meeting has not yet been agreed.

8.30 The Applicant is currently arranging a service agreement with NPTCBC. A meeting with the NPTCBC Ecology Officer will be arranged once a DAS is in place.

Assessment Methodology

8.31 The potential of the Development to affect the Favourable Conservation Status (FCS) of species will be considered, taking

account of available data on their Current Conservation Status (CCS) at the national and local level.

8.32 The assessment will be completed in accordance with CIEEM guidance and will involve:

- Determining important ecological features that require detailed impact assessment through evaluation of desk study and field survey data, consideration of the importance of ecological features within a defined geographical context (e.g. whether populations are important at the national, regional, county or local levels).
- Characterising and quantifying effects and assessing their significance through:
 - consideration of whether effects are: beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased cumulatively as a result of other plans or projects.
 - determining the significance of both beneficial and adverse effects. This will be completed in relation to the conservation status of each species at the geographical level at which it has been valued.

8.33 The value of any feature that will be significantly affected will then be used to draw conclusions as to what the implications of the Development are in legislative terms and any additional measures needed to ensure policy compliance (CIEEM, 2018).

Cumulative Assessment Methodology

8.34 Consideration and assessment of cumulative effects with other wind farm developments⁶⁹, within 10 km of the Site (Maesgwyn, Melin Court, Ffynnon Oer, Pen y Cymoedd, and Mynydd y Gwrhyd) will be undertaken as part of the EIA.

8.35 Consultation with NRW and NPTCBC will be needed to discuss and agree the scope of the cumulative assessment.

Potential Significant Effects of the Development

Construction

8.36 The Site is partly within the Sarn Helen SINC and includes Annex 1 (dry heath) and Section 7 priority habitats (marshy grassland and acid flushes) within and near to the proposed solar PV panels and turbine and locations. It is likely that the proposed Development will result in a loss of small areas of

⁶⁸ Due to overlapping call parameters.

⁶⁹ There are no solar developments within 5 km of the Site, and cumulative impacts with solar developments beyond this range are considered unlikely to occur.

these habitats as a result of solar PV panels, turbines and infrastructure.

8.37 There is also potential for indirect impacts on priority habitats and the NPT Watercourses SINC through pollution and/or changes to hydrology, particularly for groundwater dependent habitats which are afforded protection under the EU Water Framework Directive. Hydrological survey will determine the degree of groundwater dependency of the habitats present onsite and help design in avoidance or reduction of impacts. The location of possible GWDTEs (based on habitat type alone) are shown on **Figure 8.2**. The risk of pollution events occurring during construction will be minimised through the application of standard mitigation measures set out in a CEMP (see the **Approach to Mitigation** section).

8.38 The proposed Development also has the potential for killing and injury and the loss of places of shelter for the following protected species:

- Water vole: Survey work in 2022 has confirmed the presence of water vole in drains within the western part of the Site.
- Adder: Several areas of suitable habitat for adder have been identified within and near to the Site. However, common lizard has been the only species of reptile recorded within the Site to date.

8.39 The risk to these species will be minimised through the careful design of the Development.

Operation

8.40 The main potentially significant operational effect is bat fatality resulting from collision (and potentially barotrauma) with turbine blades. The assessment will be undertaken with reference to SNH *et al.* (2021) which categorises bat species in terms of their collision risk and relative abundance to give an overall population vulnerability level for the species⁷⁰.

8.41 The assessment of operational effects on bats will be further informed by the ongoing survey work at the proposed Turbine 7 location in 2022. However, given the very low-level activity of bats recorded at the Site in 2021, it is likely that the risk to bats will be low.

8.42 Effects on habitats and protected species other than bats during operation are likely to be neutral.

Decommissioning

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

8.44 There is the potential for damage to semi-natural habitats and killing and injury, disturbance and displacement of protected and priority species using the Site at the time of decommissioning.

8.45 It is reasonable to expect that there will be changes in legislation concerning habitats and protected species over the operational life of the Development. These may be driven by climatic change, government policy concerning land management, increased effectiveness / policing of species protection, ecological research, the spread of reintroduced and non-native species and other factors.

8.46 Predictions of potentially significant effects at the decommissioning phase of the Development are, therefore, not possible with any confidence. It follows that effects on protected and priority habitats and species would be best addressed through a Decommissioning Environmental Management Plan and so decommissioning effects will be scoped out.

Effects Scoped Out

8.47 Effects on statutory designated sites (the Nant-y-Rhos SSSI) can be scoped out of detailed consideration in the assessment. All non-statutory designated sites except for the Sarn Helen SINC, and NPT Watercourses SINC are also likely to be scoped out (given their distance from the Site (greater than 1 km), separation by roads or other development, and lack of any obvious hydrological connectivity).

8.48 Impacts on great crested newt can be scoped out given the likely absence recorded by eDNA and torchlight survey for all ponds within 500 m of the Site.

8.49 Legislative compliance with regard to other protected and/or priority species, such as common species of reptiles and amphibian, hedgehog *Erinaceus europaeus* and badger *Meles meles* should be possible to address through construction phase controls and are unlikely to require detailed consideration in the assessment. Of these species, only badger has been recorded in the area; small-scale activity has been noted around the periphery of the Site during previous survey work; however, no setts have been found within the Site. Pre-commencement surveys will be undertaken to confirm absence at the point of construction.

⁷⁰ This is based on evidence from the National Bats and Wind Turbines study (Mathews, F., Richardson, S., Lintott, P. & Hosken, D. (2016). Understanding the risk to European Protected Species (bats) at onshore wind turbine sites to

inform risk management. University of Exeter report to Defra) and Eurobat's data.

Approach to Mitigation

8.50 The mitigation hierarchy, which involves avoiding, reducing and where necessary compensating for ecological effects will be adopted.

- Design phase measures will include:
 - Avoidance of Annex I habitats (including Dry Heath) and minimisation of impacts on Section 7 habitats (including marshy grassland and acid flushes) for solar PV panel placement, and minimisation of impacts on these habitats for turbine placement and associated infrastructure.
 - A standoff (at least 50 m for turbines and 10 m for solar PV panels) from all watercourses to reduce the potential for effects on riverine mammals and invertebrates associated with freshwater habitats.
 - Minimisation of groundworks in areas of groundwater dependant terrestrial ecosystems through careful design of solar PV, turbine and infrastructure placement.
- Construction phase mitigation will principally be delivered through input to the CEMP. The CEMP will include the following standard ecological objectives:
 - Appointment of an ecologist tasked with ensuring compliance with all relevant regulatory and other requirements, method statements and plans, and reporting to the principal contractor and statutory consultees concerning ecological issues.
 - Identification of the scope and timing of pre-construction ecological survey work (to be informed by existing data and reconnaissance), and how this will potentially inform the approach to construction work.
 - Ecological input to method statements for all components of the work. This should set out to demonstrate how the potential for offences, pollution events and mobilisation of sediment will be avoided.
 - The appointment of an appropriately qualified and experienced ecologist to act as an Ecological Clerk of Works (ECoW) for the Development.
 - The identification of appropriate ecological awareness training for site staff and contractors in respect of the presence of protected and sensitive bird species and the importance of species-specific mitigation measures.
- Any additional requirements for mitigation measures to address significant effects will be highlighted in the ES chapter and also delivered through a CEMP.

- The requirement for operational phase mitigation will be informed by bat survey work. The current data suggests that the Site is at Low to Moderate risk site (in accordance with the definitions presented in SNH *et al.* (2021)). The requirement for a curtailment regime and post-construction monitoring will be considered following full analysis of the data and consideration of the recommendations in SNH *et al.* (2021).

8.51 In conjunction with the ecological assessment, a policy-compliant biodiversity enhancement plan will be produced and will form part of the Habitat Management Plan (HMP) for the Site. The HMP will be implemented over the operational life of the Development and may include monitoring requirements.

Questions

Question 8.1: Are consultees content with the proposed approach to the ecological desk study and site survey work?

Question 8.2: Do consultees agree that it should be possible to scope out effects on great crested newt, common species of reptile and amphibian, and badger, and detailed consideration of effects on designated sites other than Sarn Helen SINC and NPT Watercourses SINC?

Question 8.3: Do consultees agree that the scope of cumulative assessment can be limited to wind farm developments within 10 km of the Site?

Chapter 9

Ornithology

Introduction

9.1 This chapter sets out the proposed approach to the assessment of potentially significant effects of the Development on ornithological features. Ecological effects are considered in **Chapter 8**.

9.2 This chapter has been prepared by BSG Ecology.

Existing Conditions

Information Sources

9.3 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Publicly accessible online aerial imagery and Ordnance Survey mapping⁷¹.
- The UK Government's 'Magic' website⁷² (principally this is of use in locating statutory designated sites of nature conservation importance).
- Ornithological survey data for the Site, collected during 2006 and 2007 to inform a previous wind farm application at the Site⁷³.
- Ornithological data held by SEWBrEC.

The Site and its Immediate Surroundings

9.4 One statutory designated site, Nant y Rhos SSSI is located within 2 km of the Site boundary; the SSSI was not notified for its ornithological interest (**Figure 8.1**).

9.5 Desk study data obtained from SEWBrEC included records of seven species of Schedule 1 raptors (all offsite). These species were: golden eagle *Aquila chrysaetos*, red kite *Milvus milvus*, honey buzzard *Pernis apivorus*, goshawk *Accipiter gentilis*, hobby *Falco subbuteo*, peregrine *Falco peregrinus* and barn owl *Tyto alba*. Other Schedule 1 bird species for which breeding season records were returned were: black grouse *Tetrao tetrix*, kingfisher *Alcedo atthis*, common rosefinch *Carpodacus erythrinus* and common crossbill *Loxia curvirostra*.

⁷¹ <https://wtp2.appspot.com/wheresthepath.htm>

⁷² [MAGIC \(defra.gov.uk\)](https://magic.defra.gov.uk)

⁷³ Ove Arup & Partners (2007) Hirfynydd Wind Farm. Environmental Statement: Volume 1. Chapter 7: Ecology. Acciona Energy UK Ltd

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

9.6 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

Legislation

9.7 In deriving the detailed approach to the work, particular consideration has been given to those species listed under:

- Annex 1 of the Birds Directive (2009/47/EC).
- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- Section 7 of the Environment Wales Act (2016).

Policy

9.8 Consideration will be given to national and local policy, to include:

- Planning Policy Wales (PPW) 11.
- Technical Advice Note (TAN) 5 Nature Conservation and Planning.
- Future Wales (The National Plan 2040).
- The Neath Port Talbot Council (NPTC) Local Development Plan (LDP).

Guidance

9.9 The approach to ornithological survey has been based on Scottish Natural Heritage⁷⁴ (2017) guidance⁷⁵ for bird survey at onshore wind farms, which represents industry standard guidance for the UK.

9.10 The approach to the ornithological impact assessment will be based on Chartered Institute for Ecology and Environmental Management (CIEEM) guidance⁷⁶, and informed by Collision Risk Modelling using the Band Model⁷⁷ derived by Scottish Natural Heritage.

Proposed Study Area

9.11 The study area varies according to species group and survey method in accordance with industry standard (SNH, 2017) guidance (as set out in sub-section **Survey Results**).

Proposed Desk Study

9.12 Desk study to date has comprised review of:

- Aerial imagery and mapping (including mapping of designated sites).
- Ornithological records from previous survey work at the Site (in 2007).
- Ornithological records secured from SEWBReC.

9.13 It is intended to request further data for breeding honey buzzard from local raptor workers.

Proposed Field Surveys

9.14 Wintering and breeding bird survey work commenced at the Site in April 2021. The following field surveys have been completed / are underway:

- Vantage point (VP) surveys from two locations within and overlooking the Site and adjacent areas. The VP locations and 2 km viewsheds are shown on **Figure 9.1**. Focal species include all Annex 1 and Schedule 1 raptors, and owls, kestrel, wildfowl⁷⁸ and wader species.
 - Breeding season VP work commenced in April 2021, with at least 36 hours of survey data collected from each location between April 2021 and July 2021 inclusive.
 - Winter VP work commenced in September 2021, with at least 36 hours of survey data collected from each location between October 2021 and March 2022 inclusive.
 - A second breeding season of VP work has been completed using the same locations as the previous year of survey work. Thirty-six hours of data from each VP between April 2022 and August 2022 inclusive has been collected.
- Late winter / early spring surveys to detect territorial activity in goshawk. These have involved surveys from standard and supplementary VP locations within the Site and areas of forest extending to over 1 km from it, in periods of good, settled weather. These surveys were

⁷⁴ Now NatureScot but referred to as SNH where the guidance/publication was issued under this previous name.

⁷⁵ Scottish Natural Heritage. (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH, Inverness.

⁷⁶ CIEEM. (2018). Guidelines for ecological impact assessment in the UK and Ireland. CIEEM, Winchester.

⁷⁷ Band, W., Madders, M., & Whitfield, D.P. (2007) Developing field and analytical methods to assess avian collision risk at wind farms. In: Janss, G, de Lucas, M & Ferrer, M (eds.) Birds and Wind Farms. Quercus, Madrid. 259-275

⁷⁸ The latter excludes non-native and re-established goose species.

completed in 2022. The area surveyed for goshawk is shown on **Figure 9.2**.

- Breeding season VP watches to record honey buzzard activity in relation to the Site. These have involved survey work from a VP location overlooking suitable areas of forest within 2 km of the Site. The VP location and viewshed is shown on **Figure 9.1**. Nine days of VP work were completed in each of 2021 and 2022 between late May and late August inclusive.
- Breeding raptor surveys. These have been completed in accordance with the methods set out by Hardey *et al.* (2013)⁷⁹, and have included walkover surveys and ad hoc watches within a perimeter of the Site (extending to 1-2 km around it) for woodland, ground and cliff-nesting raptors⁸⁰. The raptor survey area is shown on **Figure 9.2**. Four days of work were completed during both the 2021 and 2022 breeding seasons.
- Breeding wader surveys: Surveys of the open habitats onsite were completed in accordance with industry standard guidance (SNH 2017) during 2021. The upland wader survey area is shown on **Figure 9.2**. Survey involved four visits between April and July inclusive. No breeding waders were recorded during the targeted work in 2021, and the Site is beyond the known breeding range of upland waders in Wales. Therefore, breeding wader survey was scoped out in advance of the 2022 breeding season.
- Breeding bird surveys: A breeding bird walkover survey was conducted to record all breeding passerine species within the footprint of the proposed solar PV panels, which is proposed for the semi-improved grassland area. The breeding bird survey area is shown on **Figure 9.2**. Three survey visits were completed between April and June 2022.
- Nightjar survey: Areas of permanently open habitat, clearfell and recently re-stocked plantation (up to canopy closure) were surveyed over four nights during June and July in both 2021 and 2022, to determine presence of territorial nightjar onsite and in adjacent suitable habitat. The survey involved walked transects with stopping points (shown on **Figure 9.2**). Survey timing followed recommendations in Gilbert *et al.* (1998)⁸¹.

Survey Results

9.15 Survey data gathered during 2021 and 2022 (to date) are summarised below:

- Focal raptors recorded during the survey work to date are: honey buzzard *Pernis apivorus*, red kite *Milvus*, goshawk *Accipiter gentilis*, peregrine *Falco peregrinus* and hobby *Falco subbuteo*.
 - Red kite have been the most frequently recorded target species with 63 flights recorded during the 2021 breeding season, and 38 flights between April and June 2022 inclusive.
 - Honey buzzard were recorded on 12 occasions during the 2021 surveys and have been recorded on 18 occasions during the 2022 breeding season survey work to date. During both years, most activity has been recorded over plantation to the south-east of the Site, associated with plantation woodland on the slopes of the Neath Valley. Honey buzzard is a rare breeding species nationally, but several pairs are known to breed in the Neath Valley annually.
 - Goshawk have been recorded over the Site intermittently throughout the 2021 breeding season, and a goshawk nest was located (beyond 1 km from the Site) in plantation in the Neath Valley.
 - Occasional peregrine and hobby have been recorded during the work (and unsuccessful breeding attempts by the former have been recorded locally during raptor survey work in 2021 and 2022).
 - Previous work in 2006 and 2007 had detected flights by honey buzzard, red kite, goshawk, hen harrier *Circus cyaneus*, peregrine, merlin *Falco columbarius*, barn owl *Tyto alba* and short-eared owl *Asio flammeus* over or within 2 km of the Site.
- No breeding waders were recorded onsite during 2021. Golden plover *Pluvialis apricaria*, common snipe *Gallinago* and woodcock *Scolopax rusticola* have been recorded onsite infrequently during the winter 2021 / 2022 survey work. Previous work in 2007 detected wintering and passage golden plover, common snipe and jack snipe *Lymnocyptes minimus*.
- Skylark and meadow pipit dominate the breeding passerine community within the Site. Commonly occurring species are associated with hedgerows and

⁷⁹ Hardey, J., Crick, H., Riley, H., Etheridge, B., and Thompson, D. (2013). Raptors: A field guide to surveys and monitoring. The Stationery Office; 3rd revised edition.

⁸⁰ SNH (2017) guidance is that for some species such as red kite, peregrine and hen harrier a 2 km perimeter search area is implemented, while for others such as goshawk and hobby a 1 km search area is appropriate.

⁸¹ Gilbert, G., Gibbons, D.W., & Evans, J. (1998) Bird Monitoring Methods: A Manual of Techniques for UK Key Species. The Royal Society for the protection of Birds, Sandy, Bedfordshire, England.

tree-lines in the south-western part of the Site. Crossbill *Loxia curvirostra*, has been regularly recorded within the plantation along the south-eastern boundary of the Site.

- One nightjar territory was recorded offsite, to the south-west during 2021. At least two territories were recorded (including one within the Site boundary) during 2022. Previous survey work (in 2007) did not record territorial nightjar, though one bird was recorded commuting over the Site.

Consultation

9.16 Consultation with NRW and NPTCBC is proposed. A request for a DAS meeting with NRW was issued in December 2021 and a meeting date is to be confirmed.

9.17 The Applicant is currently arranging a service agreement with NPTCBC. A meeting with the NPTCBC Ecology Officer will be arranged once a service agreement is in place.

Assessment Methodology

9.18 The assessment will be completed in accordance with CIEEM guidance and will involve:

- Determining important ornithological features that require detailed impact assessment through evaluation of desk study and field survey data through:
 - defining the ornithological zone of influence of the Development.
 - consideration of the importance of ornithological features within a defined geographical context (e.g. whether populations are important at the national, regional, county or local levels).
- Characterising and quantifying effects and assessing their significance through:
 - considering whether effects are beneficial, adverse or neutral; their extent, magnitude, duration, reversibility, timing and frequency; and whether there is potential for their significance to be increased cumulatively as a result of other plans or projects.
 - determining the significance of both beneficial and adverse effects. This will be completed in relation to the conservation status of each species at the geographical level at which it has been valued.

9.19 The process will be informed by Collision Risk Analysis⁸². This will involve extrapolation of flight-data obtained during VP surveys, to calculate the number of flights likely to occur through the rotor swept area when the Development becomes

operational. Following the application of avoidance rates, predicted fatalities per year and over the operational life of the Development (for each regularly occurring focal species) will be determined.

9.20 The value of any feature that will be significantly affected will then be used to draw conclusions as to what the implications of the Development are in legislative terms and whether it is likely to be policy compliant (CIEEM, 2018).

Cumulative Assessment Methodology

9.21 Consideration and assessment of cumulative effects with other developments, in particular wind farm sites, within a 10 km radius of the proposed Development (Maesgwyn, Melin Court, Ffynnon Oer, Pen y Cymoedd, and Mynydd y Gwrhyd) will be undertaken as part of the EIA.

9.22 The most relevant of these other developments is likely to be the operational Pen y Cymoedd Wind Farm (due to its size), located approximately 9.5 km south-east of the Site. However, other proposals will also be considered as part of the work.

9.23 Views are being sought as part of this Scoping Report from the statutory consultees such as NRW and NPTCBC on the scope of the cumulative assessment.

Potential Significant Effects of the Development

Construction

9.24 There is potential for significant effects resulting from disturbance and displacement of breeding birds to occur during construction works. Standard mitigation measures set out in a CEMP will avoid the destruction of active nests of breeding birds during clearance of track-side plantation woodland and broad-leaved scrub completed as part of the Site preparation works

9.25 Breeding birds potentially disturbed or displaced by these works include Schedule 1 species (red kite, goshawk, and crossbill) and nightjar recorded holding territory in areas of plantation beyond the Site periphery during ongoing survey work.

9.26 No breeding raptors or waders have been recorded within the Site.

9.27 Ongoing forest operations will likely result in changes in the availability of suitable nesting habitat for nightjar and breeding raptors over time. There is the potential for colonisation of areas closer to the Site during construction than were recorded during the baseline survey work.

⁸² The random flight model will be used for all species. No regularly used flight paths have been recorded during the survey work.

Operation

9.28 The main potentially significant effect during operation will be collision of breeding raptors with turbines. This has the potential to affect both forest-nesting species and those breeding within the wider landscape and using the airspace above the Site when commuting or foraging.

9.29 Ongoing work suggest that the most commonly recorded focal raptor species will be red kite. Much of the Site is grazed by sheep, and carcasses are likely to provide an occasional foraging resource for red kite.

9.30 Honey buzzard are known to breed in the local area, and while most of the flight activity recorded is offsite (associated with valley slopes and mature mixed woodland plantation) occasional flights over the Site by ranging birds have been recorded.

9.31 Despite the presence of eyries in the wider area, flight activity over the Site by peregrine is typically low, suggesting birds forage elsewhere. Hobby have been recorded very occasionally during the ongoing work, but recorded activity does not indicate a local nest site.

9.32 Significant effects may also arise from operational phase displacement of breeding forest-nesting raptors from areas of plantation close to operational turbines.

9.33 The potential for collision and operational displacement of nightjar during operation is considered to be minimal. This is based on survey data and understanding of the results of monitoring at various Welsh wind farms⁸³.

Decommissioning

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

9.35 Species most likely to be disturbed and displaced from the Site during decommissioning are those that breed, roost or forage within it at that time.

9.36 It is reasonable to expect that there will be changes in legislation concerning protected species, as well as changes in local populations and distribution over the operational life of the Development. These may be driven by climatic change, landscape-scale land management, increased effectiveness / policing of protection, changes in the attitude of land managers to birds, the spread of reintroduced populations, changes on the wintering and staging grounds of migrant species and other factors.

9.37 Predictions of potentially significant effects at the decommissioning phase of the Development are, therefore, not possible with any confidence. It follows that effects on protected and priority habitats and species would be best addressed through a Decommissioning Environmental Management Plan, and decommissioning effects will be scoped out.

Effects Scoped Out

9.38 It is likely that construction and operational phase effects on barn owl can be scoped out, as survey work has not recorded use of suitable farm buildings by this species. Disturbance is therefore unlikely to be an issue, and empirical data indicates collision is very unlikely to occur.

9.39 Other potential issues, such as disturbance and / or displacement of breeding short-eared owl, merlin and waders can be scoped out of detailed assessment unless survey work currently underway indicates a change in baseline conditions from the results of previous survey. There is no indication of this currently.

Approach to Mitigation

9.40 Construction phase mitigation will principally be delivered through input to the CEMP. Ornithological objectives of the CEMP will include:

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

⁸³ Work completed at sites including Pen y Cymoedd, Brechfa Forest West and Clocaenog Wind Farms has established that birds will hold territory very close to

wind turbines. Construction phase disturbance effects have not been observed to extend beyond 200 m (Mike Shewring pers comm).

9.41 In conjunction with the ecological assessment, a policy-compliant biodiversity enhancement plan will be produced and will form part of the HMP for the Site. The HMP will be implemented over the operational life of the Development and may include monitoring requirements.

Questions

Question 9.1: Are consultees content with the proposed approach to the ornithological desk study and site survey work?

Question 9.2: Do consultees agree that the scope of cumulative assessment can be limited to wind farm developments within 10 km of the Site?

Chapter 10

Noise and Vibration

Introduction

10.1 This chapter sets out the proposed approach to the assessment of potential significant effects of noise and vibration from the Development on nearby noise-sensitive receptors.

10.2 This chapter has been prepared by Hoare Lea.

Existing Conditions

Information Sources

10.3 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Ordnance Survey mapping of the surrounding area.
- 2007 Environmental Statement for the previous wind farm application at the Site.

The Site and its Immediate Surroundings

10.4 The area east of the Site appears to have a low population density, with the nearest dwellings appearing to be located approximately nearly 2 km away (see **Figure 5.12**). The settlement of Crynant is located to the south-west of the Site, and Seven Sisters (Blaendulais) to the north, with some isolated farmsteads on the outskirts of these settlements as well as at Nant-y-Cafn, and along the A4109. Some commercial areas are also located west of the Site.

10.5 It is therefore expected that, in addition to 'natural' sources, such as wind disturbed vegetation and birds, sources such as road traffic noise and human activities will affect the background noise environment to varying degrees. In addition, noise from watercourses and farm activities may be observed at some of the properties.

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

10.6 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

Legislation

- Environmental Protection Act 1990 (EPA).
- Control of Pollution Act 1974, Part III, HMSO (CoPA).

Policy

- Planning Policy Wales (PPW, edition 11, February 2021).
- Future Wales; the National Plan 2040.
- Technical Advice Note (TAN) 11: Noise (1997)⁸⁴.

Guidance

- ETSU-R-97⁸⁵.
- the IOA Good Practice Guide (IOA GPG⁸⁶).
- British Standard (BS) 5228⁸⁷.
- British Standards (BS) 4142⁸⁸.
- Calculation of Road Traffic Noise (CRTN)⁸⁹.
- Design Manual for Roads and Bridges (DMRB)⁹⁰.

10.7 PPW and Future Wales policies require consideration of potential noise impacts for wind farms such as the Development, including cumulative impacts where relevant. PPW makes reference to the recommendations of ETSU-R-97 as the relevant guidance in order to assess operational wind farm noise.

10.8 PPW also references good practice in the application of the ETSU-R-97 methodology, as set out in Institute of Acoustics Good Practice Guide to the Application of ETSU-R-97 (IOA GPG). This includes guidance on the assessment of cumulative operational noise impacts from wind farms, and on this point, further guidance set out in an article in the Institute of Acoustics Noise Bulletin⁹¹ will also be considered.

10.9 Noise from fixed plant other than wind turbines, associated with the substation, solar photovoltaic panels and battery energy storage system (BESS), will be assessed using BS 4142⁸² which is also referenced in TAN 11.

10.10 To assess construction noise and vibration, Annex B of TAN 11 refers to BS 5228. Part 1 of the standard (BS 5228-1) provides guidance on a range of considerations relating to construction noise including the legislative framework, general control measures, example methods for estimating construction

noise levels and example criteria which may be considered when assessing the significance of any effects. Similarly, Part 2 (BS 5228-2) provides general guidance on legislation, prediction, control and assessment criteria for construction vibration.

10.11 TAN 11 does not deal specifically with noise from stone extraction (for example from borrow pits). However, Welsh planning guidance on surface mineral extraction provides guidance that is relevant to the types of mineral extraction activity associated with site construction works. Specifically, Minerals Technical Advice Note (Wales) 1: Aggregates (MTAN 1)⁹² can be referenced in addition to general guidance in BS 5228-1 and BS 5228-2.

Proposed Study Area

10.12 The assessment will consider noise-sensitive residential locations nearest to the final turbine locations. Specifically, ETSU-R-97⁷⁹ states that noise levels will be considered acceptable, even in the absence of measured baseline data, if predicted noise levels (including cumulative contributions from all wind farms) do not exceed 35 dB LA90.

10.13 Therefore, the study area for noise will encompass dwellings where predicted levels approach or are likely to approach this threshold, and also include properties located closer to the Site. This will comprise dwellings located in the NPTCBC area. However, some locations will be discounted if the specific contribution of the Development is negligible relative to that of the other schemes considered (see below).

10.14 The study area will tend to include most dwellings potentially affected by noise or vibration from the construction of the Development's infrastructure. In addition, dwellings located along the Site's access track and local public roads will also be considered in relation to construction traffic noise effects.

10.15 Commercial or industrial receptors are of low/very low sensitivity to noise and unlikely to be significantly affected by the Development and will therefore not be considered in detail in the assessment. Derelict properties will also be discounted from the analysis.

⁸⁴ Welsh Government (1997), Technical advice note (TAN) 11: Noise.

⁸⁵ The Working Group on Noise from Wind Turbines (1997), the Assessment and Rating of Noise from Wind Farms (ETSU-R-97), Final Report for the Department of Trade & Industry.

⁸⁶ Institute of Acoustics (2013), M. Cand, R. Davis, C. Jordan, M. Hayes, R. Perkins, A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, May 2013 (IOA GPG).

⁸⁷ British Standard Institute (BSI, 2014): BS 5228: 2009 + A1:2014, Code of practice for noise and vibration control on construction and open sites, Parts 1 & 2.

⁸⁸ BSI (2019). BS 4142: 2014 + A1:2019: Methods for rating and assessing industrial and commercial sound.

⁸⁹ Department of Transport (1988), Calculation of Road Traffic Noise.

⁹⁰ Welsh Government (2020), Design Manual for Roads and Bridges, LA 111 Noise and vibration, revision 2.

⁹¹ Bowdler et al., Wind farms cumulative impact assessments, Jan/Feb 2016 Acoustics Bulletin, Institute of Acoustics.

⁹² Minerals Planning Policy (Wales), Minerals Technical Advice Note (Wales) 1: Aggregates, National Assembly for Wales, 2004.

Proposed Desk Study

10.16 Latest available information on cumulative wind farms in the area will be reviewed to inform this aspect of the assessment; **Table 2.1** presents the current list of wind farms. Mapping and other data will also be reviewed to consider noise-sensitive receptors located in the vicinity of the Site.

Proposed Field Surveys

10.17 ETSU-R-97 requires the baseline environment within the study area to be characterised by measuring background noise levels as a function of site wind speed at the nearest neighbours (or, at a representative sample of the nearest neighbours). ETSU-R-97 also requires that any such measurements are not significantly influenced by existing operational turbines, to prevent unreasonable cumulative increases.

10.18 The measurements previously undertaken for the 2007 application at the Site are not in line with current good practice and therefore it is proposed to undertake new noise monitoring.

10.19 The potential implication of wind shear effects due to the potential heights of the turbines considered for the Development will be taken into account in line with best practice. This will consist of referencing a sufficiently high wind speed reference for the proposed new background noise measurements.

10.20 The baseline data acquired for the assessment of operational wind turbine noise will also be suitable for consideration of noise from other fixed plant associated with the Development using BS 4142.

Consultation

10.21 A consultation letter presenting the survey methods and selection of noise-sensitive receptors was issued to the Environmental Health Department of NPTCBC on 5 September 2022. The assessment methodology, in particular with regards to cumulative impacts, will also be discussed with NPTCBC. Representatives of the Council have been invited to attend during setup of the equipment for these surveys to agree measurement positions.

Assessment Methodology

Construction Noise and Vibration

10.22 In assessing the effects of noise and vibration from the construction activities, it is common practice to accept that the associated works are of a temporary nature. The assessment of potential effects due to noise emissions during construction will be undertaken in accordance with the BS 5228 Part 1 guidance. Predictions of construction noise will be made referencing typical activity emission levels and likely variations in noise levels at surrounding receiver locations, using the

methodology set out in the guidance. This standard is referenced in TAN 11 and can be used to predict noise levels associated with the different construction activities which are likely to occur throughout the construction programme. Part 2 of the BS 5228 standard considers construction vibration and this will also be referenced.

10.23 Any blasting if used for rock extraction at borrow pits may also create vibration and air overpressure which may require attention.

10.24 Consideration will also be given to the potential effects of construction traffic on sensitive receptors in the area. Depending upon the outcome of the assessment of traffic (See **Chapter 11: Access, Traffic and Transport**), the effect of traffic along the Site access route will be assessed on the basis of the methodology within BS 5228-1, and CRTN, where appropriate.

10.25 The assessment of the temporary effects of construction noise is primarily aimed at understanding the need for dedicated management measures and, if so, the types of measures that are required. In this respect, relevant working practices, traffic routes, and proposed working hours will be considered in the assessment.

10.26 The assessment of construction noise and vibration will identify if and when predicted noise levels may be above standard guideline limits, taking into account the rural character of the area. For construction traffic, the criteria set out in the DMRB are also likely to be referenced. Construction noise management mitigation will also be determined if considered to be required.

10.27 Significant construction noise effects will be determined whereby the predicted noise levels are above the standard construction guideline limits set by BS 5228-1 and CRTN.

Operational noise

10.28 The methodology for the assessment of operational noise from wind farms in Wales recommended in planning guidance is that documented in ETSU-R-97. In summary, the assessment shall:

- Identify the nearest noise-sensitive receptors.
- Determine the quiet day-time and night-time noise limits from measured background noise levels at the nearest neighbours (see above).
- Specify the type and noise emission characteristics of the wind turbines proposed for the Site.
- Calculate noise emission levels which would be due to the operation of the wind turbines as a function of site wind speed at the nearest neighbours, including the cumulative effect of all turbines.

- Compare the calculated wind farm noise emission levels with the derived noise limits.

10.29 The good practice guidance referenced above (IOA GPG) will be taken into account, including advice on baseline survey, wind shear assessment and noise prediction methodology.

10.30 The proposed substation, solar photovoltaic panels and BESS are likely to be located within 1 km of some of the noise sensitive receptors. An assessment of operational noise will be undertaken in line with BS 4142, based on representative noise emission data for the electrical/mechanical plant units which may be installed, on a worst-case basis. The predicted levels at neighbouring receptors would be assessed relative to the existing baseline background noise levels at the relevant receptors, accounting for the potential character of the noise in accordance with BS 4142. The greater the difference between predicted operational noise levels and baseline levels, the greater the effect, subject to also accounting for a number of contextual factors. As part of the contextual analysis, it is relevant to consider the absolute noise levels which, if sufficiently low, may be considered acceptable regardless of background levels.

10.31 Significant operational noise effects will be identified should the derived operational turbine noise limits (including cumulative noise) and operational noise from other components (solar, battery storage and substation) relative to background levels be exceeded at the assessment receptor locations.

10.32 A representative wind turbine will be nominated for the assessment of operational noise from the Development and meet the design requirements. A computer model will be constructed and used to predict noise levels resulting from the operation of the proposed Development, based on the methodology detailed in ISO 9613-2:1996, with the specific modelling procedure defined in the IOA GPG.

Cumulative Assessment Methodology

10.33 When considering neighbouring cumulative wind farm noise, the potential noise emissions from neighbouring wind farm sites will be considered by examining the potential level of noise emission allowed under the respective consent for each of the sites, in line with current best practice (see guidance referenced above).

10.34 The ETSU-R-97 limits, for each noise-sensitive receptor, apply to the total noise produced by all wind farms. Therefore, potential cumulative operational noise levels, including existing, consented and application wind turbines in the area, must be assessed relative to these limits. This is the case unless it is considered that these effects are likely to be negligible: based on the IOA GPG guidance cumulative noise effects need not be considered where differences between the noise level

contribution of two wind farms are 10 dB or more at any given residential receptor.

10.35 The sites considered for this cumulative noise analysis will include, the Maesgwyn Wind Farm and extension (**Figure 2.1**). The Pen y Cymoedd Wind Farm is located more than 5 km to the south-east and, despite its scale, cumulative noise levels are unlikely to be significant and therefore this can be scoped out. As noted above, a review of cumulative wind farms in the area will be undertaken as part of the assessment.

Potential Significant Effects of the Development

Construction

10.36 During construction, noise could arise from both onsite activities, such as the construction of onsite access tracks, turbine foundations, the substation/control building etc. and from the movement of construction related traffic both onsite and travelling on public roads to and from the Site.

Operation

10.37 During operation, wind turbines have the potential to create noise effects through both aerodynamic noise and mechanical noise. Noise will also be emitted from other operational elements of the Development including battery storage, substation and solar transformers.

Effects Scoped Out

10.38 It is proposed that the following effects are scoped out:

- It is recognised that vibration resulting from the operation of wind farms is imperceptible at typical separation distances. It is therefore proposed to scope out the assessment of vibration produced during the operation of the Development.
- Traffic during the operational phase of the Development is likely to be very low and is considered unlikely to have any noise effects and is therefore also proposed to be scoped out.
- Decommissioning is likely to result in less noise than during construction of the Development and similar management measures can be employed and therefore this can be scoped out.

10.39 The consensus from research in the UK and elsewhere is that infrasound and low frequency noise from wind turbines at typical separation distance will be at low or imperceptible levels and that this is therefore not a source of significant noise impacts. The current recommendation from the planning policy referenced above is that ETSU-R-97 should continue to be used for the assessment and rating of operational noise from

wind farms. It is therefore not proposed to undertake specific assessments of infrasound and low frequency noise, but the noise ES chapter will consider the latest supporting information on these subjects and the topic of wind turbine blade swish or Amplitude Modulation (or AM).

Approach to Mitigation

10.40 As outlined in Chapter 2, the Applicant will implement accepted good practice during the construction and operation the Development. Standard good practice construction techniques and compliance with policy and legislation would be requirements of the CEMP, which is considered to be an integral part of the construction process rather than 'mitigation'. For example, the following mitigation measures are assumed to be in place for the purposes of the assessment:

- Restriction of construction hours.
- Good practice management measures relating to control of construction noise and vibration.

10.41 The above measures will be implemented via the CEMP.

10.42 The CEMP would also be used to implement any additional Site-specific management measures, which are not part of standard good practice, and these would be highlighted as part of the assessment.

10.43 Mitigation of wind turbine operational noise will be achieved through the design of the Development, such that the relevant ETSU-R-97 noise limits can be achieved at the surrounding properties with commercially available wind turbines, taking into account the noise emissions from other wind farms in the area.

10.44 If there is a potential for non-negligible noise from non-turbine components associated with the Development, engineering and design control measures would be outlined.

Questions

Question 10.1: Are the consultees happy with the suggested approach for the noise assessment?

Question 10.2: Do the consultees agree with the proposed scope of the cumulative operational noise assessment?

Question 10.3: Do the consultees have any comments on the effects proposed to be scoped out?

Chapter 11

Access, Traffic and Transport

Introduction

11.1 This chapter sets out the proposed approach to the assessment of potential significant effects of the Development on access, traffic and transport.

11.2 This chapter has been prepared by Pell Frischmann Consultants Limited.

Existing Conditions

Information Sources

11.3 The following sources of information have been reviewed during the desk-based research for this Scoping Report and will be considered in the assessment:

- Department for Transport Road Traffic Database⁹³.
- Google StreetView.
- Ordnance Survey.

The Site and its Immediate Surroundings

11.4 The Site will be directly accessed from an upgraded access junction on the A4109, located to the north-east of Cefn Coed Museum and using an existing forest access track.

11.5 A detailed access review is being undertaken to confirm the design of the junction for the Site and consultation with NPTCBC will be undertaken once the final access solution has been determined.

11.6 The access junction will provide the sole access to the Site for abnormal loads associated with the turbine equipment, as well as access for heavy goods vehicles (HGVs) transporting construction materials and general staff vehicles during construction and operation.

11.7 A detailed site access review for Abnormal Indivisible Loads (AIL) will be provided to accompany the application and will be appended to a Transport Assessment (TA). This will detail the finalised access option in detail and will outline the reasoning for the selected access option.

11.8 The finalised access option would then be used to determine the traffic impact associated with the Development. This will be assessed in a TA. The impact assessment will be

⁹³ <https://www.data.gov.uk/>

summarised in the ES which will also examine the impact upon affected receptors.

Proposed Approach to Surveys and Assessment Methodology

Legislation, Policy and Guidance

11.9 This section presents a summary of the legislation, policy and guidance that will inform the approach to the design and assessment of the Development.

11.10 A TA will be provided to review the impact of transport related matters associated with the Development. This will be appended to the ES and will be summarised into the Access, Traffic and Transport ES chapter.

Legislation, Policy & Guidance

11.11 The following policy and guidance documents will be used to inform the Access, Traffic and Transport ES Chapter:

- Future Wales – The National Plan 2040 (2021).
- Planning Policy Wales (PPW).
- Technical Advice Note (TAN) 18 Transport.
- Welsh Transport Appraisal Guidance (WelTAG) (2017).
- Strategic Traffic Management Plan (sTMP).
- Pulling Together, Best Practice for Transporting Abnormal Loads in Wales (Welsh Government, 2020).

Proposed Study Area

11.12 The study area for the assessment has considered likely access routes for the delivery of raw materials. For the purposes of the assessment, it is assumed that bulk materials will be sourced from quarry sites located on the A474 corridor to the west of the Site and concrete from Briton Ferry, to the south.

11.13 The suggested study area is therefore defined by the following road links:

- The M4 between Junctions 42 and 45.
- The A465 between Swansea and Resolven.
- The A4109 between its junction with the A465 and Crynant.

11.14 No other road links are predicted to result in a 10% increase in traffic flow and are therefore excluded.

Proposed Desk Study

11.15 Traffic survey data will be obtained for the trunk road network from the UK Department of Transport (DfT) count

database. In addition, traffic accident statistics will be obtained from Crashmap for a five-year period for the A4109 between its junction with the A465 and Crynant.

Proposed Field Surveys

11.16 Further traffic count data will be obtained from Automatic Traffic Count (ATC) sites will be established for one week at the following location to provide baseline traffic data in the study:

- At the proposed A4109 site access junction.

11.17 Baseline traffic growth for future years will be factored using Low National Road Traffic Forecasts (NRTF).

11.18 It is anticipated that abnormal load vehicles carrying turbine components will travel to the Site from Swansea Port (see **Figure 11.1**). Loads will continue from the port to the Development via the following route:

- Exit the Port onto the A483 and proceed north-east to the M4.
- Join the M4 at Junction 42 and then depart at Junction 43.
- Join the A465 and proceed north-east.
- Depart the A465 at Aberdulais and proceed to the Site via the A4109. At the Site's access junction, loads will turn right onto the Development access road.

11.19 The Route Survey will consider the above route in detail following a site visit.

11.20 No abnormal loads are required for the proposed solar and battery storage elements of the Development.

Consultation

11.21 The following stakeholders will be consulted:

- NPTCBC, as local road authority.
- Welsh Government, as trunk road agency.

11.22 All relevant structure owners along the proposed access route will be consulted as part of the Electronic Service Delivery for Abnormal Loads (ESDAL) weight review.

Assessment Methodology

Construction Assessment Methodology

11.23 The Guidelines for the Environmental Assessment of Road Traffic (IEMA 1993) sets out a methodology for assessing potentially significant environmental effects associated with traffic. 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.
- Potential impacts (of changes in traffic flows) on land uses and environmental resources fronting these roads, including the relevant occupiers and users.

11.24 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%).
- Rule 2: Include any other specifically sensitive areas where total traffic flows are predicted to increase by 10% or more.

11.25 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 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.

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

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

Cumulative Assessment Methodology

11.28 Cumulative traffic impacts will only be considered where an adjoining or neighbouring site has planning consent in place, is of a significant scale in traffic terms (i.e. has associated traffic impact of over 10%) and will be taking place over the same/similar construction timeframe. Schemes without consent cannot be considered as being committed and will therefore be excluded.

11.29 A list of significant traffic generating schemes will be agreed with the local planning authority to determine what schemes, if any, should be included in the future baseline traffic flows.

Potential Significant Effects of the Development

Construction

11.30 The key issues for consideration as part of the assessment for the construction phase will be:

- The temporary change in traffic flows and the resultant, temporary effects on the study network during the construction phase for residents and users of the study network roads.
- The physical mitigation associated with the delivery of abnormal loads.
- The design of new access infrastructure.
- The consideration of appropriate and practical mitigation measures to offset any temporary effects.

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

11.32 The main transport impacts will be associated with the movement of general HGV traffic travelling to and from the Site during the construction phase of the Development.

Operation

11.33 No significant effects are associated with the operational phase of the Development – see **Effects Scoped Out** below.

Decommissioning

11.34 Significant effects may be created during the decommissioning phase; however these will be less than the construction phase. As such it is proposed that these are scoped out and addressed by a condition of consent at the relevant time of decommissioning.

Effects Scoped Out

11.35 Once operational, it is envisaged that the level of traffic associated with the Development will be minimal. Regular weekly visits would be made 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 site for specific maintenance and/or repairs. It is considered that there will be no significant effects resulting from operational traffic and therefore no detailed assessment of the operational phase of the Development is proposed. The operational phase will be scoped out of the EIA.

11.36 The traffic generation levels associated with the decommissioning phase will be less than those associated with the construction phase. Some elements such as access roads would be left in place on the site, where their retention is agreed

with the landowner, other stakeholders and by condition with the Local Authority.

11.37 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 would be made immediately prior to decommissioning works proceeding.

Approach to Mitigation

11.38 Standard mitigation measures that are likely to be included in the assessment are:

- Production of a Framework 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.
- A Framework Abnormal Load Transport Management Plan.

Questions

Question 11.1: Is the proposed methodology acceptable, including what is proposed to be scoped out and the approach to the cumulative assessment?

Question 11.2: Are the proposed traffic survey locations acceptable?

Question 11.3: Is the use of Low National Road Traffic Forecasts (NRTF) acceptable for the whole of the study to determine future year traffic flows?

Question 11.4: What committed development traffic flows should be included in the baseline traffic flows?

Question 11.5: Is a Framework Abnormal Load Transport Management Plan sufficient for the planning consideration stage?