Mynydd Llanhilleth Wind Farm

Environmental Statement

Appendix 1A – Scoping Report

August 2024

Pennant Walters

MYNYDD LLANHILLETH WIND FARM

Environmental Impact Assessment Scoping Report

May 2021

QUALITY CONTROL

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1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 Pennant Walters ('the Applicant') proposes to apply to Welsh Ministers for permission to construct and operate Mynydd Llanhilleth Wind Farm ('the Development'), which is proposed to be located south-east of Abertillery and east of the settlement of Llanhilleth ('the Site). The site location is shown in Figure 1.1.

1.1.2 This Scoping Report is submitted in relation to the Development, which proposes the construction and operation of up to twelve wind turbines with a maximum tip height of 180m together with associated and ancillary development including a control building, electricity transformers and anemometry mast, grid connection, access works, temporary construction compound and associated works.

1.1.3 The turbines will have a combined installed capacity of over 10 megawatts (MW) and, as such, falls within the definition of a 'Development of National Significance' (DNS), as defined by Section 4 of the DNS (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016, for the purposes of Section 62D of the Planning (Wales) Act 2015.

1.1.4 Part of the Site is registered as Common Land and makes up part of Mynydd Llanhilleth Common. As such, it is intended that the DNS application will be accompanied by a secondary application for consent to deregister and exchange common land and consent to carry out works on common land (Sections 16 and 38 of the Commons Act 2006).

1.1.5 The Development exceeds the threshold for wind developments as set out in Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended by the Environmental Assessments and Miscellaneous Planning (Amendment) (EU Exit) Regulations 2018) ('the Regulations'). On the basis that the Development could result in 'significant' environmental effects according to the Regulations, in line with Schedule 3, the Development is classified as an Environmental Impact Assessment (EIA) development and an Environmental Statement (ES) is required.

1.1.6 This Scoping Report therefore accompanies a written request for a Scoping Direction to the Planning Inspectorate Wales under Regulation 33 in respect of applications for planning permission to Welsh Ministers as a DNS project.

1.1.7 In accordance with Regulation 33 (2) this request for a Scoping Direction therefore includes as part of this Scoping Report:

a) a plan sufficient to identify the land;

b) a brief description of the nature and purpose of the Development including its location and technical capacity;

c) its likely significant effects on the environment;

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

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

1.1.8 This request for a Scoping Direction seeks the views of the Planning Inspectorate Wales, on behalf of the Welsh Ministers, as to the scope and level of detail of information to be provided in an ES in support of the Mynydd Llanhilleth wind farm project.

1.1.9 Part 5, Regulation 17 (4) of the EIA Regulations requires that: "*An environmental statement must—(a) be prepared by persons who in the opinion of the relevant planning authority or the Welsh Ministers, as appropriate, have sufficient expertise to ensure the completeness and quality of the statement.*" In this respect any developer for a DNS scheme is required under sub-paragraph (b) to include a statement regarding the expertise of the person (company) undertaking the EIA and composing the ES.

1.1.10 Savills has been appointed by the Applicant as EIA coordinator for the Mynydd Llanhilleth wind farm. Savills has completed EIA projects, including renewable energy projects throughout the UK across a variety of consenting regimes. Savills has maintained accreditation through the Institute of Environmental Management and Assessment (IEMA) quality mark since its inception, which requires adherence to and compliance with specified commitments and includes reviews of key EIA personnel and ES in order to ensure they meet the required standards. Through maintaining the IEMA accreditation Savills ensures it has the required competency to conduct and coordinate EIAs. The specialist sub-consultants also have appropriate accreditation and competence to meet the requirements of the Regulations, with further statements made in the sub-sections below. An appropriate statement will also be made within the ES.

1.1.11 Table 1.1 below confirms the appointed specialist consultant team for the project.

Table 1-1: Specialist EIA Team

Discipline/ES chapter	**Consultant**
Ecology & Biodiversity Ornithology Landscape & Visual Impact Cultural Heritage & Archaeology	EDP
Hydrology Hydrogeology, Geology, & Ground conditions Transport, Movement & Access Noise & Vibration	Wood
Other EIA topics: - Socio-Economic - Land Use - Telecommunications & Utilities - Human Health - Shadow Flicker	 Savills Savills Wood Wood Wood

Discipline/ES chapter	Consultant
- Climate Change	Wood
- Major Accidents & Disasters	Wood

1.2 REPORT STRUCTURE

1.2.1 The remainder of this report is structured as follows:

- **Chapter 2 Environmental Impact Assessment**: provides a summary of the EIA process;
- **Chapter 3 The Development**: provides a brief description of the nature and purpose of the Development;
- **Chapter 4 Legal & Policy Context**: sets out the policy background relevant to the Development;
- **Chapters 5-13** outlines the disciplines to be assessed in the EIA and those that are proposed to be scoped out of EIA; and
- **Chapter 14 Conclusions**: sets out the main conclusions.

1.2.2 Appendices are included for chapters 5, 6 and 7.

2 ENVIRONMENTAL IMPACT ASSESSMENT

2.1 OVERVIEW

2.1.1 EIA is the process of systematically evaluating and presenting all the likely significant environmental effects, both positive and negative, of a proposed development to assist the determining authority in making an informed decision on an application for consent to undertake a development. It enables the significance of effects to be clearly understood, incorporating consideration of mitigation (for negative effects) and enhancement (for positive effects) measures. The final results of the EIA process are presented within an ES to accompany an application for consent for the Development.

2.1.2 EIA is an iterative process which takes place alongside and informs project design. As potential effects are identified, the design of the Development will be modified to reduce or avoid adverse effects and enhance positive effects where possible.

2.2 SCOPING

2.2.1 The purpose of this scoping report is to provide sufficient information to enable the Planning Inspectorate Wales, as advised by statutory consultees, to specify the scope of the EIA for the Development. To do so it provides:

- details of the proposed Development;
- the environmental and field-based survey work undertaken to date;
- the potential significant environmental effects to be assessed within the EIA and ES; and
- the proposed EIA survey and assessment methods.

2.2.2 Each discipline within this report outlines:

- Potential significant effects associated with the Development (during construction and/or operation) for detailed assessed within the ES;
- Likely mitigation and monitoring measures to improve significant effects or measures to be implemented through the design process; and
- Those impacts which are assessed to be outside of the scope of the EIA ("*scoped-out*") because a significant effect is not anticipated.

2.2.3 On the basis of completed survey work, desktop studies and the professional judgment of the project team, each topic-based chapter in this report is structured as follows:

- introduction;
- relevant law, policy and guidance;
- engagement and consultation feedback (where available);
- summary of the environmental baseline and potential sources of impact;
- proposed method of assessment and reporting;
- potentially significant effects associated with the construction, operation and decommissioning of the Development;
- cumulative and in-combination effects;
- those effects assessed unlikely to be deemed significant, and therefore able to be scoped-out of the EIA process;
- approach to mitigation, including embedded mitigation in the design process; and
- a list of key questions for consultees.

2.2.4 Key questions for the EIA process are included at the end of each relevant chapter, to focus on key aspects and expectations for assessment. To assist this process, we have consolidated a list of all questions from each relevant chapter and included in the Conclusion.

2.2.5 In doing so, each topic-based chapter also seeks to:

- confirm and agree the basis of baseline environmental information;
- agree survey and assessment approach and methodology;
- obtain any other relevant comments from consultees on the proposed survey and assessment methodologies;
- obtain responses from consultees to questions;
- confirm the preferred approach to presenting the assessment in the ES; and,
- receive any further relevant information from consultees and the competent authority.

Scope of Assessment

2.2.6 The EIA will assess the effects arising from both the construction and operation of the Development (up to 35 years operational life) and the decommissioning of the infrastructure.

2.2.7 The spatial scope of the EIA will take account of:

- The individual components of the proposed project, including all ancillary development and development required for a temporary period;
- The baseline environmental conditions within the study area;
- Key receptors to the likely environmental effects; and
- Relevant UK, national and local planning policy.

2.3 APPROACH TO ASSESSMENT

Consultations for the Purposes of EIA

2.3.1 Further to this EIA scoping exercise, ongoing consultation with PINS and the key statutory consultees will continue (as necessary) to confirm the detailed methodology for specific assessments. Each topic-based EIA chapter will reference the supporting engagement and consultations that were undertaken with expert stakeholders on the methodology employed, and proposed consultation.

Pre-Application Consultation

2.3.2 The Applicant will undertake effective pre-application consultation with the Local Planning Authorities, consultees and other stakeholders (including local community and residents) in accordance with the requirements of the DNS process. Further details and timings will be confirmed shortly, taking into account the latest Welsh Government advice regarding the Covid-19 situation. This will support timely decision-making, reduce possible delays arising as a result of the effects of the coronavirus pandemic, and maintain public participation in the decision-making process.

2.4 ASSESSMENT METHODOLOGY

2.4.1 Each technical chapter of the ES will include an explanation of the assessment methodology used for the specific assessment topic, adopted from relevant guidance where this is in place. Wherever possible, the methodologies will be used to predict environmental effects in a standard framework. Where there is variation from this approach, an explanation will be provided in the relevant ES chapter to provide contextual information to support the criteria used. The final approach to the grid connection will also be set out and explained.

2.4.2 The EIA will identify environmental effects by estimating the predicted change that will take place as a result of the construction and operation of the Development compared with the baseline scenario. Each chapter will begin by identifying potential receptors. A receptor might be a location, a group of locations, buildings, people, features or wildlife and each topic subject will potentially affect a different range of receptors. Each chapter will identify those receptors relevant to the topic and explain how they have been identified. Once the receptors are identified they will then be assessed to determine their sensitivity to change as a result of the project from the known baseline. The receptors will be attributed a sensitivity level ranging from high to low as set out in Table 2.1 below.

Table 2-1: Sensitivity of a generic environmental receptor to change

Sensitivity	Receptor type
High	Receptors of high importance with a high susceptibility to change and limited potential for substitution or replacement.
Medium	Receptors with some sensitivity to change and medium importance. Often have relevance at a regional scale with some opportunity for substitution or replacement.
Low	Receptors with low importance and sensitivity to change, often of relevance at a local scale.
Negligible	The receptor has very low importance / is not sensitive to change.

2.4.3 The magnitude of impact affecting each receptor will then be assessed. These can be positive or negative as well as temporary or permanent. The nature of each will be analysed based on quantitative and qualitative techniques and a magnitude assigned ranging from major to no change, as set out in Table 2.2 below.

Table 2-2: Criteria for the magnitude of environmental impact

Magnitude	Description of criteria
Negligible	Very minor changes that are not noteworthy or material.
Minor	Some measurable changes that are noteworthy and material. Minor benefit or minor loss/detrimental change to the receptor's characteristics, features or elements.
Moderate	Adverse loss of resource or damage to characteristics, features or elements but limited impact on integrity; or Benefit or addition to characteristics, features and elements that improve the receptor.

Magnitude	Description of criteria
Major	Effects will be of a consistently high magnitude and frequency and cause severe damage to key characteristics, features and elements or even total loss; or Major improvement to characteristics, features and elements of receptor.

2.4.4 The environmental effect is a function of the sensitivity of receptors and the magnitude of the impact and will be dependent upon the outcomes of the assessment process. Having identified the sensitivity of the receptor and the magnitude of the impact the standard significance matrix for the project set out in Table 2.3 below will indicate the level of the effect ranging from negligible to substantial. For the purposes of the ES, unless specifically defined otherwise in an ES chapter, effects of moderate and higher are assessed to be significant effects.

Table 2-3: Framework for identifying environmental effects

Receptor sensitivity	**Magnitude of impact**			
	Negligible	*Minor*	*Moderate*	*Major*
Negligible	Neutral	Neutral	Minor/neutral	Minor
Low	Neutral	Minor	Moderate	Moderate/Major
Medium	Neutral	Moderate	Moderate/Major	Major
High	Neutral	Moderate/Major	Major	Substantial

2.4.5 Whilst the definition of levels of effect will be defined within each chapter of the ES, Table 2.4 sets out general definitions for topics where specific EIA guidance is not available.

Table 2-4: Broad Definition of Effect

Effect	**Definition**
Substantial	A key factor in the decision-making process. Generally, but not exclusively associated with features of national importance which cannot be replaced or relocated.
Major	Likely to be important considerations at a regional or district scale but, if adverse, are potential concerns, depending upon the relative importance attached to the issue.
Moderate	Important at a local scale but are not likely to be key decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor	Effects concerning local issues that are of relevance at the detailed design stage.
Neutral	Effects which are not perceptible, or within normal bounds of variation or forecasting.

2.4.6 The likely effects of the Development will be described as:

- Adverse / beneficial;

- Direct / indirect;
- Temporary / permanent;
- Reversible / irreversible.

Baseline Assessment

2.4.7 The topic-based chapters of the ES will identify the current baseline scenario, and where relevant the future scenario, against which the environmental effects of the Development will be measured. This will include assessment of cumulative development, as described below. The baseline assessment will involve describing the current state and circumstances of the identified receptors and changes that might be expected to occur as a result of the Development and other cumulative development.

Assessment of Environmental Effects

2.4.8 The topic-based chapters will identify receptors that are likely be affected by the Development (taking into account elements of the scheme design that are inherent in the mitigation of potential effects from the Development). The assessments will then outline the potential impacts that could arise as a result of the Development in the absence of any additional mitigation. Where adverse effects are identified, the ES will set out the measures assessed to mitigate any significant adverse effects of the Development, where feasible and necessary. The residual effects will be evaluated and an assessment of their significance will be reported based upon the magnitude of impact against the sensitivity of the receptor.

Assumptions and Limitations

2.4.9 In the preparation of the ES, it is assumed that all legislative requirements will be met and the Development will be constructed in accordance with industry standard techniques and best practice methods implemented on-site. It is therefore not necessary to re-assess this as mitigation that will be evaluated in the assessment of residual effects. Further details are set out in the following Sections.

Assessment of Cumulative Effects

2.4.10 The requirement for cumulative effects assessment is set out in Schedule 4 of the EIA Regulations. At Schedule 4(5), the EIA Regulations require "*A description of the likely significant effects of the development on the environment resulting from, inter alia: … (e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*".

2.4.11 The cumulative impact comprises the combined effects of the Development with other existing and/or approved development. It is proposed that the EIA will consider the following:

- proposals that have been granted planning permission but are not yet constructed or operational; and,
- schemes which are under construction or are operational.

2.4.12 The potential for cumulative effects needs to be assessed with regard to specific environmental receptors, the characteristics of the natural environment as well as the neighbouring communities. The ES will assess which other developments have the potential for cumulative effects when the construction and operational phases could be concurrent, and where there are sensitive receptors common to both developments within a defined geographical area. A list of wind farm developments known to lie within approximately 20km of the Site are provided in Table 2.5 below.

2.4.13 As the cumulative baseline is constantly evolving, and the relevant cumulative schemes will vary by topic, the schedule of cumulative schemes to be included in the assessment will be finalised following consultation with relevant consultees. In general, it is not proposed to use the pre-assessed areas in Future Wales to inform the assessment of cumulative effects, because these areas are indicative only given the limitations[1] identified in the methodology for identifying these areas, and as illustrated by proposals coming forward outside of the pre-assessed areas as notified to PINS Wales. However, the pre-assessed areas may be relevant to the assessment of cumulative effects relevant to specific topic areas.

Table 2-5: Wind Farm Developments within approximately 20km of the Site

Wind Farm	Local Authority	No. of Turbines	Tip Height (m)	Distance from Development Site	Status
Coed y Gilfach Farm	Blaenau Gwent CBC	2	45	2.4 km	Operational
Pen-y-Fan Industrial Estate	Caerphilly CBC	1	124	4.4 km	Operational
Pen y Fan Ganol Farm	Caerphilly CBC	1	73.5	5.1 km	Operational
Oakdale Business Park	Caerphilly CBC	2	130	5.1 km	Operational
Blaentillery Farm	Blaenau Gwent CBC	2	45	7.1 km	Operational
Penrhiwgwaith Farm	Blaenau Gwent CBC	1	86.5	7.8 km	Operational
Cruglwyn	Caerphilly CBC	1	86.5	8.0 km	Operational
Gelli-wen Farm	Caerphilly CBC	1	77	8.2 km	Operational
Pen-yr-heol Farm	Caerphilly CBC	1	77	9.0 km	Operational
Groesfaen Farm	Caerphilly CBC	1	77	9.8 km	Operational

[1] The pre-assessed areas for wind energy are informed by a strategic consideration of constraints at a national scale, applying generic buffer zones which require further consideration and assessment in a regional, local and certainly site scale. The pre-assessed areas provide a starting point to inform more site specific assessment in the context of Policy 18 of Future Wales

Wind Farm	Local Authority	No. of Turbines	Tip Height (m)	Distance from Development Site	Status
Bedlwyn Farm	Caerphilly CBC	1	86.5	10.1 km	Operational
Cefn Bach Farm	Caerphilly CBC	1	78	10.3 km	Operational
Bryn Ysgawen Farm	Caerphilly CBC	1	77	10.3 km	Operational
Tyle Crwth	Caerphilly CBC	1	76	10.7 km	Operational
Castell Llwyd Farm	Caerphilly CBC	1	77	12.8 km	Operational
Eurocaps Premises, Crown Business Park	Blaenau Gwent CBC	2	45	13.4 km	Operational
Rassau Industrial Estate (Unit 18)	Blaenau Gwent CBC	1	78	13.6 km	Approved
Rassau Industrial Estate (Former Tech Board Site)	Blaenau Gwent CBC	1	78	13.6 km	Operational
Rassau Industrial Estate (Unit 15)	Blaenau Gwent CBC	1	72	13.6 km	Operational
Pen Bryn Oer	Caerphilly CBC	3	110	13.8 km	Operational
Tafamaubach Industrial Estate	Blaenau Gwent CBC	1	74	14.0 km	Operational
Cefn Fforest Farm	Merthyr Tydfil CBC	1	102	14.4 km	Approved
Tir Cook Farm	Merthyr Tydfil CBC	1	77	14.6 km	Operational
11 East Way Road, Alexandra Docks	Newport Council	1	125	16.2 km	Operational
Solutia	Newport Council	2	126.5	16.5 km	Operational
South Docks - Newport Docks	Newport Council	1	126	16.9 km	Operational
Pengarnddu Industrial Estate (St Merryn meat Factory)	Merthyr Tydfil CBC	1	77	17.0 km	Operational
Pengarnddu Industrial Estate (plot 5)	Merthyr Tydfil CBC	1	77	17.0 km	Operational
Pengarnddu Industrial Estate (plot3)	Merthyr Tydfil CBC	1	77	17.0 km	Operational
Nash Treatment Works	Newport Council	1	130	18.0 km	Operational
G24i	Cardiff City Council	1	120	21.0 km	Operational
Ferndale	Rhondda Cynon Taf CBC	8	74	24.0 km	Operational

Wind Farm	Local Authority	No. of Turbines	Tip Height (m)	Distance from Development Site	Status
Maerdy	Rhondda Cynon Taf CBC	8	145	28.0 km	Operational
Mynydd Bwllfa	Rhondda Cynon Taf CBC	9	115/125	28.0 km	Operational
Pen-y-Cymoedd	Rhondda Cynon Taf CBC	76	145	30.0 km	Operational

2.5 MITIGATION AND MONITORING

2.5.1 Paragraph 7 of Schedule 4 of the EIA Regulations notes that the ES should include: *"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases".*

2.5.2 The ES will therefore identify and describe measures required to avoid, reduce or offset, where possible, significant environmental effects caused by the Development, including inherent mitigation. The final assessment of significance will take into account the additional mitigation measures and constraints that have been incorporated into the Development i.e., it will be the assessment of residual effects. It will also consider whether any monitoring of effects is required.

2.6 QUESTIONS FOR CONSULTEES

2.6.1 Can the consultees please confirm:

Question 2.1	Whether there are other wind farm proposals or other developments that are candidates for consideration in the cumulative assessment, please?

3 THE SITE AND DEVELOPMENT

3.1 THE APPLICANT

3.1.1 Pennant Walters is a renewable energy company which was formed in 2003 utilising, at first, the Walters Group Welsh land portfolio. Pennant Walters is part of the Walters Group and is based in Hirwaun - a local company operating nationally, employing up to 500 people in areas such as civil engineering, plant hire, renewable energy and general development. The group has diversified significantly in the last 20 years.

3.1.2 Since 2003 the Applicant has developed, built and now operates six wind farms in South Wales along with some solar for a total 127MW, making it Wales' largest home-grown renewable energy developer. Pennant Walters firmly believe in developing a long-lasting relationship with all stakeholders including surrounding communities, landowners, local authority and regulators.

3.1.3 Pennant Walters takes all its sites from inception through the planning process, financing to construction and then on to operational management. The company manages all six of its wind projects allowing consistency and continuity for the local community and stakeholders and ensuring the same personnel through the life of the project (in most cases in excess of 15 years).

3.2 THE APPLICATION SITE AND SURROUNDING AREA

3.2.1 The Site (as shown in Figure 1.1) occupies an area of approximately 371 hectares (ha). However, the Development footprint will only occupy a small percentage of this area with the turbines proposed to be located within the developable area, as set out below and shown in Figure 3.1.

3.2.2 The site benefits from good existing vehicular access, suitable wind speeds and access to grid connection – all technically appropriate locational requirements for a wind farm development.

3.2.3 Figure 1.1 identifies the Site in line with Regulation 33 (2) a) of the Regulations. This identifies the location of the Development and the associated and ancillary development, as follows: -

- An indicative developable area of c.193 hectares – this is the area within which the main part of the Development, i.e., the proposed wind turbines, together with ancillary development comprising control building, electricity transformers and anemometry mast and associated development such as the temporary construction compound and main internal wind farm access tracks would be located.
- A site access route/corridor – this is a narrow corridor to indicate the main access route for construction and operation of the ML wind farm project, which capitalises on the existing road. Tracks will be identified from the access corridor to the turbine locations.
- A site access point – an existing access point into the Site.
- A grid connection corridor – showing an indicative area within which grid connection from the Site to the substation will be provided.

3.2.4 The Site is split across two Local Planning Authorities; the majority of the Site lies to the east within the Torfaen County Borough Council (TCBC) whilst part of the Site to the west lies within Blaenau Gwent County Borough Council (BGCBC). The Site occupies part of Mynydd Llanhilleth Common, public rights of way and minor roads cross parts of the Site such as Blaen-y-Cwm Road in the west of the Site which connects the small settlements of St. Illtyds to the north-west of the Site and Pantygasseg to the south of the Site. Another minor road runs east-west through the northern part of the Site to connect St. Illtyds to Talywain and Abersychan.

3.2.5 The Site is set within the wider site context of the upper valleys of South Wales; the elevated and exposed plateau with a north-south orientation upon which the Site sits is framed by the Ebbw Valleys to the west, and Afon Lwyd Valley to the east. The arterial road network and merging settlements are largely confined within valley bottoms although some isolated dwellings and farmsteads are also scattered along valley sides.

3.2.6 The Site occupies part of Mynydd Llanhilleth Common located between Abersychan (within TCBC) and Abertillery (within BGCBC), in addition to encompassing a former quarry and associated area of coniferous woodland across its southern extents. It lies in the centre of a large, north-south trending ridge of high land between the Cwm Afon valley (Abersychan, Pontypool etc.) to the east, and the Ebbw Fach valley (Abertillery) to the west. This ridge comprises a series of plateaux typically between 400m and 550m above sea level and is characterised by much unenclosed land grazed by sheep, and to a lesser extent cattle and horses. There is much evidence of historic industrial activity on the slopes of the ridge, particularly in the Cwm Avon valley. Areas of plantation forestry are common elsewhere on the slopes of the ridge and dry-stone walls augmented with post and wire fencing demarcate the edge of the unenclosed area from the surrounding enclosed pastures. These are managed in a relatively intensive manner and appear to be relatively species-poor.

3.2.7 A minor public highway, running north-east to south-west, from Abersychan to Llanhilleth, bisects the study area. Numerous unmetalled tracks otherwise cross the study area. A small stream/flush arises from the block of coniferous woodland/quarry area and flows southwards. Additionally, there are several waterbodies, several being located within the former quarry and created from former quarry workings.

3.2.8 The Site straddles two local authority areas – TCBC and BGCBC. The majority of the Site, site access corridor and grid connection corridor are in TCBC.

3.2.9 The TCBC LDP proposals map indicates that the Site includes a designated Regionally Important Geological Site, as well as most of the Tir Pentwys Preferred Area, with a further designation for the Mineral Site Buffer Zone. A small part of the Site on its norther extent is within a Special Landscape Area (SLA) - Western Uplands. Large areas of the Site are aggregate; and coal safeguarding areas.

3.2.10 The part of the Site that falls within BGCBC includes two Sites of Importance for Nature Conservation (SINC) and is also a SLA - St Illtyd Plateau and Ebbw Eastern Sides. The Site is within a variety of minerals designations, including aggregates safeguarding areas, buffer zones, areas where coal working is not allowed and coal safeguarding areas.

3.3 DESCRIPTION OF DEVELOPMENT

3.3.1 At this stage, it is proposed the Development will comprise the following:

- Up to 12 wind turbines, anticipated to be 4 – 6MW each with an indicative height of up to 180m to tip together with external transformer housing (to be operational for 30 years);

- Turbine foundations, crane pads and laydown areas;
- An electrical substation and control building;
- Underground power cables linking the turbines and the on-site substation;
- Construction of access tracks off main access corridor;
- Permanent anemometer mast for wind turbine performance monitoring;
- Construction enabling works; and
- A temporary construction and storage compound.

3.3.2 No felling is proposed as part of the Development with woodland and forestry areas not proposed as developable areas.

Wind Turbines

3.3.3 The proposed turbines have yet to be selected but are anticipated to be between 4 and 6MW rating. However, it is proposed the likely height to blade tip will be up to 180m, which has been used for the purpose of scoping of initial potential effects. The location of the turbines will be refined through the EIA and consultation process but will fall within the indicative developable area.

3.3.4 A transformer will be required for each turbine and could be located within or adjacent to the turbines, depending on the specification of final turbine type. For the time being, we have assumed the transformers will be located adjacent to the turbines within the footprint of the hard standing area.

3.3.5 The turbines will be installed on foundations comprising both stone and steel-reinforced concrete. These will be dressed back with topsoil to allow re-vegetation. The detailed design, sizing and specification for each foundation will depend on the final turbine type and the specific ground conditions encountered at each turbine location, which will be confirmed during pre-construction surveys.

3.3.6 Each wind turbine requires an area of hardstanding to be built adjacent to the turbine foundation. This provides a stable base on which to lay down turbine components ready for assembly and erection, and to site the two cranes necessary to lift the three-tower section, nacelle and rotor into place. The crane hardstanding will be left in place following construction to allow for the use of similar plant should major components need replacing during the operation of the wind farm.

3.3.7 The hardstanding could also be utilised during decommissioning at the end of the wind farm's life. The total area of hard standing at each turbine location including the turbine foundations and the crane pad will be approximately 2,640sqm. Approximately a third of this area will be dressed back with topsoil and landscaped into the surrounding area upon completion of turbine erection.

Access and Vehicle Movement

Access for Construction Traffic

3.3.8 Access into the Site, as shown on Figure 3.1, is proposed from the existing road through the common coming from a north westerly direction from Talywain. The existing road is anticipated to have a typical running surface width of approximately 5.0m which is necessary to facilitate the safe passage of Abnormal Indivisible Loads (depending on the turbine supplier specifications). It may be necessary to widen to road at bends to accommodate the 'swept path' of vehicles carrying long and wide loads, to be informed by further survey and assessment work.

On-Site Access Tracks and Cable Runs

3.3.9 The Development will be served by a new network of onsite access tracks branching from the site access corridor (as shown on Figure 3.1) to enable construction and maintenance once operational. It is anticipated that cabling connecting turbines and the control building (see below) will be laid in trenches running alongside the access tracks wherever practicable. These will be excavated to an indicative maximum depth of 750mm and backfilled. The layout of the tracks will be determined by the final turbine positions and informed by an assessment of relevant environmental receptors and effects, including on-site ecology.

Electrical Substation & Control Building

3.3.10 The Development is proposed to be connected to Western Power Distribution's (WPD) network line that runs to Abersychan - 66kV substation. This voltage connection means that all on site electrical equipment will be housed inside of the control building/on-site substation. The dimensions of the building are not yet finalised and will depend on requirements but is expected to have a footprint of approximately 15m x 20m. The location of the control building/substation is not yet known but will be located within the indicative developable area though it is not intended to be located on the common. Its location will be influenced by a number of factors such as distance to the point of connection, access during the operation of the wind farm, and environmental constraints - all of which will be assessed further throughout the iterative design of the wind farm and EIA process.

Temporary Construction Compound

3.3.11 The temporary construction compound will likely be located close to the Site access point, as shown on Figure 3.1, (but not intended to be on the common) to support management of all construction access on to the Site. A typical compound will be in the region of 120m x 50m to give flexibility for dedicated storage and parking areas to support site health and safety through vehicle and pedestrian segregation. The construction stage disturbance associated with the temporary construction compound is minimal. Typically, surface soils will be stripped and stockpiled and the surface then capped with geofabric and aggregate. Once construction is complete the stone is lifted and the surface soils re-spread, allowing the area to regenerate.

Grid Connection Corridor

3.3.12 The grid corridor, as shown in Figure 3.1, is an indicative area of approximately 1.7km in length and up to 0.13 – 0.17km wide from the on-site substation to the WPD 66kV substation at Abersychan. This is an indicative corridor within which it is anticipated the required grid connection cable would be located. The point of connection extends circa 1.5km to the east of the Site.

3.3.13 There are two potential options for delivering a grid connection. WPD could deliver the connection using its permitted development rights, or Section 37 of the Electricity Act. Alternatively, Pennant Walters could address with a future planning application subsequent to the main consent. In this context, a high-level assessment of the main environmental constraints within the grid connection is to be undertaken. The short distance and the initial constraints analysis, as shown in Figure 3.1 confirms that a grid connection is likely to be possible without unacceptable environmental impacts. An initial feasibility assessment has confirmed that the grid connection infrastructure would avoid intrusive trenching and is likely to comprise a single circuit 66kV cable provided over ground (wooden poles).

3.3.14 At this stage consultees are requested to confirm that the assessment methods/approach specified within the relevant chapters of this scoping report for this approach are appropriate for assessing the wider grid connection corridor.

3.4 CONSTRUCTION OF THE DEVELOPMENT

3.4.1 The construction period for the wind farm will last approximately 36 months. The construction process will consist of the following principal activities:

- potential enabling works e.g., up-grading of existing road and construction of new access tracks and passing places inter-linking the turbine locations and substation (involving import of material);
- works to public highway to facilitate delivery of turbines which will be confirmed following discussion with the Highways Authority;
- formation of temporary construction and storage compound including hard standing and temporary site office facilities;
- construction of crane pads to facilitate erection of turbines;
- construction of turbine foundations and transformer bases where required by the selected turbine;
- construction of site substation and transformer building;
- excavation of trenches and cable laying adjacent to site access tracks and roads, where possible;
- connection of on-site distribution and signal cables;
- delivery and erection of wind turbines;
- commissioning of site equipment; and
- site restoration.

3.4.2 Many of these operations will be carried out concurrently, although predominantly in the order identified to minimise the overall length of the construction programme and to manage impacts. In addition, development will be phased such that at different parts of the Site, the civil engineering works will be continuing whilst wind turbines are being erected. Site restoration will be programmed and carried out to allow restoration of disturbed areas as early as possible and in a progressive manner.

3.5 OPERATIONAL PHASE

3.5.1 It is proposed that planning permission will be requested to allow for an operational period of 30 years. Maintenance work will involve visiting the Site regularly to undertake scheduled maintenance and operational checks. Annual servicing will involve the undertaking of non-essential repairs on blades, gearboxes and generators.

3.6 DECOMMISSIONING PHASE

3.6.1 At the end of the operational period, the Development will be decommissioned by removing the turbines and associated electrical equipment. Alternatively, a new application may be made to extend its life or replace the turbines.

3.6.2 When dismantling and removing the turbines the bases would be broken out to below ground levels and all cables cut at depth below ground level and left in the ground. This approach is considered to be less environmentally damaging than seeking to remove foundations and cables entirely. The turbine components themselves will be taken to an appropriate recycling facility where applicable. Due to timescales it is not possible to identify a specific facility at this time.

3.6.3 On-site access tracks would either be left for use by the landowner and other users or covered with topsoil. It is not intended that stone would be removed from the Site. The decommissioning works are estimated to take twelve months.

3.6.4 It should be noted that Pennant Walters will establish a decommissioning fund during the life of the project.

3.7 QUESTIONS FOR CONSULTEES

3.7.1 Can the consultees please confirm:

Question 3.1	Consultees are requested to confirm that the assessment methods/approach specified within the relevant chapters of this scoping report for this approach are appropriate for assessing that wider grid connection corridor.

4 LEGAL & POLICY CONTEXT

4.1 LEGISLATIVE CONTEXT

4.1.1 This section provides an overview of the national and local legislative and policy background relevant to the Development. An appraisal of the Development and its contribution to UK and Wales decarbonisation and renewable energy targets will be presented in a Planning Statement that will accompany the DNS planning application. For the ES, it is proposed that a summary will be provided of the most relevant policy, focussed on each specialist topic. At this stage the following legal and policy context have been assessed to be relevant.

4.1.2 The relevant primary legislation for renewable energy development of national significance in Wales is as follows:

- Well-being of Future Generations (Wales) Act 2015
- Planning (Wales) Act 2015
- Environment (Wales) Act 2016

4.1.3 The Wellbeing of Future Generations Act requires public bodies in Wales to put long-term sustainable development at the forefront of considerations and action.

4.1.4 The Environment (Wales) Act 2016 set a legal target of reducing greenhouse gas emissions by at least 80% by 2050, including a series of interim targets (for 2020, 2030 and 2040) and associated carbon budgets for key sectors. The Climate Change (Carbon Budgets (Wales) Regulations 2018 set a carbon budget for the 2016 to 2022 budgetary period limited to emissions an average of 23% lower than the baseline, and a carbon budget for the 2021 to 2025 budgetary period with emissions limited to an average of 33% lower than the baseline.

4.1.5 Following the UK's commitment to the Paris Agreement, the Committee on Climate Change (CCC) recommended a 95% reduction by 2050 target for Wales. The Welsh Government intended to legislate on this basis while setting out a bigger ambition to reach net zero by 2050. The WGs declaration of a climate change emergency in 2019 and the goal under the Wellbeing of Future Generations Act for a Globally Responsible Wales provided the context for a review of the targets, which aligned with the principle of progression enshrined in the Paris Agreement. Updated advice from the CCC outlined a pathway for Wales to meet a net zero target by 2050. The Climate Change (Carbon Budgets) (Wales) (Amendment) Regulations 2021 has revised the carbon budgets to require 63% reduction by 2030; 89% by 2040; and at least a 100% reduction, or net zero, by 2050.

4.1.6 Planning (Wales) Act 2015 outlines powers to Ministers to determine strategic energy projects of 10-50MW (subsequently amended to 350MW) and a new approach of consolidated planning consents. Accordingly, the following provides the framework for the relevant procedural requirements:

- Town and Country Planning Act 1990
- Planning and Compulsory Purchase Act 2004
- Developments of National Significance (Wales) Regulations 2016
- Developments of National Significance (Specified Criteria and Prescribed Secondary Consents) (Wales) Regulations 2016 (as amended)
- Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (as amended)

4.1.7 The DNS application will be promoted and assessed in accordance with the above primary and secondary legislation, as amended.

4.2 FUTURE WALES: THE NATIONAL PLAN

4.2.1 Future Wales: The National Plan 2040 was published in February 2021 and is the National Development Plan for Wales, setting out the direction for development to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy and achieving decarbonisation and climate-resilience. Future Wales 2040 set out the national development plan context for energy and provides specific policies for heat network and renewable energy development.

4.2.2 Future Wales incorporates the following national policy targets on renewable energy:

- For 70% of electricity consumption to be generated from renewable energy by 2030;
- For one gigawatt of renewable energy capacity to be locally owned by 2030;
- For new renewable energy projects to have at least an element of local ownership from 2020.

4.2.3 Future Wales states that the planning system plays a significant role in the provision of new renewable and low carbon energy and gives effect to the Welsh Government's national targets, setting the overall strategic framework and direction within which developers can proposed new energy infrastructure projects. Future Wales notes that "*Wales can become a world leader in renewable energy technologies. Our wind and tidal resources, our potential for solar generation, our support for both large and community scaled projects and our commitment to ensuring the planning system provides a strong lead for renewable energy development, mean we are well placed to support the renewable sector, attract new investment and reduce carbon emissions".*

4.2.4 The pre-assessed areas for wind energy alongside Policies 17 and 18 provide policy direction setting out requirements for DNS scale projects, as set out in Table 4.1 below.

4.2.5 These pre-assessed areas have been identified by the Welsh Government and are considered, in principle, to be areas where DNS scale onshore wind projects would be acceptable subject to the criteria of Policy 17. Accordingly, there is a presumption in favour of large-scale onshore wind energy development and the associated landscape change, subject to the criteria within Policy 18.

4.2.6 The Site is partly located within 'pre-assessed area for wind energy (area 10)', which means Policy 17 is relevant, yet there is emphasis on Policy 18 as it provides the criteria to frame assessment priorities and decision making.

Table 4-1: Strategic spatial criteria-based policies on renewable energy

Policy Reference	Policy text
17	**Renewable and Low Carbon Energy and Associated Infrastructure** The Welsh Government strongly supports the principle of developing renewable and low carbon energy from all technologies and at all scales to meet our future energy needs. In determining planning applications for renewable and low carbon energy development, decision- makers must give significant weight to the need to meet

Policy Reference	Policy text
	Wales' international commitments and our target to generate 70% of consumed electricity by renewable means by 2030 in order to combat the climate emergency. In Pre- Assessed Areas for Wind Energy the Welsh Government has already modelled the likely impact on the landscape and has found them to be capable of accommodating development in an acceptable way. There is a presumption in favour of large- scale wind energy development (including repowering) in these areas, subject to the criteria in policy 18. Applications for large- scale wind and solar will not be permitted in National Parks and Areas of Outstanding Natural Beauty and all proposals should demonstrate that they will not have an unacceptable adverse impact on the environment. Proposals should describe the net benefits the scheme will bring in terms of social, economic, environmental and cultural improvements to local communities. New strategic grid infrastructure for the transmission and distribution of energy should be designed to minimise visual impact on nearby communities. The Welsh Government will work with stakeholders, including National Grid and Distribution Network Operators, to transition to a multi- vector grid network and reduce the barriers to the implementation of new grid infrastructure.
18	**Renewable and Low Carbon Energy Developments of National Significance** Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria: 1. outside of the Pre- Assessed Areas for wind developments and everywhere for all other technologies, the proposal does not have an unacceptable adverse impact on the surrounding landscape (particularly on the setting of National Parks and Areas of Outstanding Natural Beauty); 2. there are no unacceptable adverse visual impacts on nearby communities and individual dwellings; 3. there are no adverse effects on the integrity of Internationally designated sites (including National Site Network sites and Ramsar sites) and the features for which they have been designated (unless there are no alternative solutions, Imperative Reasons of Overriding Public Interest (IROPI) and appropriate compensatory measures have been secured); 4. there are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species; 5. the proposal includes biodiversity enhancement measures to provide a net benefit for biodiversity;

Policy Reference	Policy text
	6. there are no unacceptable adverse impacts on statutorily protected built heritage assets; 7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance; 8. there are no unacceptable impacts on the operations of defence facilities and operations (including aviation and radar) or the Mid Wales Low Flying Tactical Training Area (TTA- 7T); 9. there are no unacceptable adverse impacts on the transport network through the transportation of components or source fuels during its construction and/or ongoing operation; 10. the proposal includes consideration of the materials needed or generated by the development to ensure the sustainable use and management of resources; 11. there are acceptable provisions relating to the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration. The cumulative impacts of existing and consented renewable energy schemes should also be considered.

4.3 NATIONAL PLANNING POLICY

4.3.1 Planning Policy Wales (Edition 11, February 2021) (PPW) sets out the land use planning policies for Wales. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. Table 4.1, below, sets out the planning policies which have been assessed to be relevant to the Site and the Development.

4.3.2 Alongside Future Wales, PPW outlines the way in which the planning system supports the delivery of sustainable development through both Strategic and Local Development Plans. In relation to renewable and low carbon energy, PPW states that "*Local authorities should facilitate all forms of renewable and low carbon energy development and should seek cross-department co-operation to achieve this. In doing so, planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved. Planning authorities should seek to maximise the potential of renewable energy by linking the development plan with other local authority strategies, including Local Well-being plans and Economic/Regeneration strategies".*

4.4 TECHNICAL ADVICE NOTES

4.4.1 Technical Advice Notes (TANs) provide detailed planning advice. TANs should be read in conjunction with Planning Policy Wales, which sets out the land use planning policies of the Welsh Government. TAN 8 provides a detailed framework for considering renewable energy development, however it has been revoked alongside the introduction of Future Wales and the revised PPW (Edition 11)

4.4.2 The TANs are typically topic specific, therefore are identified in the relevant chapters of this scoping report, for example, TAN 11 (noise) is of relevance to the development and aims to ensure that noise generating development does not cause an unacceptable degree of disturbance.

4.5 LOCAL PLANNING POLICY

4.5.1 The Site straddles two local authority areas – TCBC and BGCBC. The majority of the Site, site access corridor and grid connection corridor are in TCBC.

Torfaen County Borough Council

4.5.2 The Development is located partly within the administrative area of TCBC. The authority adopted its Local Development Plan (LDP) in December 2013. The Replacement LDP process is ongoing.

4.5.3 The LDP proposals map indicates that the Site includes a designated Regionally Important Geological Site, as well as most of the Tir Pentwys Preferred Area, with a further designation for the Mineral Site Buffer Zone. A small part of the Site on its norther extent is within a SLA - Western Uplands. Large areas of the Site are aggregate; and coal safeguarding areas.

4.5.4 In respect of the TCBC constraints map, the Site includes a number of relatively small areas of surface water flooding, as well as a few areas identified as Coal Authority 'High Risk Areas'.

4.5.5 The site access and grid connection corridors are in proximity to the Former British site which is a strategic site in the existing LDP. It is nor proposed that the Former British site is taken forward as a strategic site for the RLDP, but may be considered for other uses including renewable energy.

4.5.6 There are a number of policies that are relevant and aligned with national policy and the relevant policies in Future Wales. In addition, we note the following policies in Table 4.2 below.

Table 4.2 – TCBC LDP policies

Policy Reference	Policy text
BW1 – General Policy – Development Proposals	All development proposals will be considered favourably providing they comply with the following criteria where they are applicable: - B i) The proposal does not result in unacceptable adverse effects in respect of land contamination, instability or subsidence; air, heat, noise or light pollution; landfill gas; water pollution; or flooding, from or to the proposal; B iv) The proposal contributes to the conservation and/or enhancement of the strategic biodiversity network of Torfaen and does not result in a significant adverse effect on the network;

Policy Reference	Policy text
C2	Special Landscape Areas are identified at the following locations: - C2/8 - Western Uplands. In order to ensure the continued protection and enhancement of the defined SLA's development proposals that could impact on these designations will be expected to conform to high standards of design and environmental protection which is appropriate to the LANDMAP character of the area.

4.5.7 The Council has also adopted the following Supplementary Planning Guidance which will inform the assessment process:

- Annex 2: Highways and Transport;
- Annex 5: Ecology and Biodiversity; and
- Annex 6: Recreation and Public Open Space.

Blaenau Gwent County Borough Council

4.5.8 The Development is located partly within the administrative area of Blaenau Gwent. The authority adopted its Local Development Plan (LDP) in November 2012. The Council are currently consulting on their Revised Local Development Plan.

4.5.9 The Site includes two Sites of Importance for Nature Conservation (SINC) and is also a SLA - St Illtyd Plateau and Ebbw Eastern Sides. The Site is within a variety of minerals designations, including aggregates safeguarding areas, buffer zones, areas where coal working is not allowed and coal safeguarding areas.

4.5.10 The Site is not within any designation on the BGCBC Constraints Map.

4.5.11 There are a number of policies that are relevant and aligned with national policy and the relevant policies in Future Wales. In addition, we note the following policies of relevance at Table 4.3 below.

Table 4-2: BGCBC LDP policies

Policy Reference	Policy text
SP7 – Climate Change	The Council will seek to address climate change and reduce energy demand to improve the sustainability of the valley communities in Blaenau Gwent by: 1. Addressing the causes of climate change through: a. Encouraging more of the County Borough's electricity and heat requirements to be generated by renewable and low/zero carbon technologies;
Other relevant policies	SP10 – Protection and Enhancement of the Natural Environment SP11 – Protection and Enhancement of the Historic Environment DM14 – Biodiversity Protection and Enhancement

Policy Reference	Policy text
	DM16 – Trees, Woodland and Hedgerow Protection ENC2 – Special Landscape Areas ENV3 – Sites of Importance for Nature Conservation M1 – Safeguarding of Minerals M2 – Mineral Buffer Zones

4.5.12 The Council has also adopted the following Supplementary Planning Guidance which will inform the assessment process:

- Planning Guidance for Smaller Scale Wind Turbine Development: Landscape and Visual Impact Assessment Requirements; and
- Nature Conservation Planning Guidance.

4.6 QUESTIONS FOR CONSULTEES

Question 4.1	Do consultees consider that all the relevant legislation, policy, advice and guidance have been identified to frame this assessment?

5 ECOLOGY & BIODIVERSITY

5.1 INTRODUCTION

5.1.1 This Ecology and Biodiversity chapter of the Environmental Statement will be prepared by competent experts from the Environmental Dimension Partnership Ltd (EDP), who are full members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have significant experience of EIA for a range of schemes. The chapter will be prepared with reference to The CIEEM's Ecological Impact Assessment Guidelines (2018).

5.1.2 This Ecology and Biodiversity chapter will provide an Ecological Impact Assessment (EcIA) of the potential effects of the Development on important ecological features (IEFs) such as designated sites, habitats, and species populations (excluding ornithology, considered separately under Chapter 6).

5.1.3 The chapter will describe: the baseline conditions at the Site and surroundings; the assessment methodology; the potential significant ecological effects of the Development; and the proposed approach to mitigation required to otherwise prevent, reduce or offset any significant negative effects.

5.1.4 The approach proposed in this Scoping Report has been informed by ongoing desk studies, field surveys, consultation, reference to published best practice guidance and professional judgement. Where 'significant' effects cannot be avoided through inherent design, the EcIA will recommend additional mitigation and/or compensation or monitoring measures.

5.1.5 A description of the Project Site, nature and purpose of the Development is provided in Chapter 3.

5.1.6 This chapter should be read in conjunction with the following appendices:

- Appendix 5.1: Study Area (edp6367_d017a 13 May 2021 MJC/KH);
- Appendix 5.2: Internationally Designated Sites (edp6367_d013a 13 May 2021 MJC/KH);
- Appendix 5.3: Nationally Designated Sites (edp6367_d014a 13 May 2021 MJC/KH);
- Appendix 5.4: Non-statutory Designated Sites (edp6367_d015a 13 May 2021 MJC/KH);
- Appendix 5.5: Phase 1 Habitat Survey (edp6367_d002a 12 May 2021 MJC/EWI);
- Appendix 5.6: Botanical Survey (edp6367_d016a 13 May 2021 MJC/KH);
- Appendix 5.6: Bat Activity Transect Routes (edp6367_d009a 13 May 2021 MJC/KH);
- Appendix 5.7: Anabat Swift Locations (edp6367_d006a 12 May 2021 MJC/LL);
- Appendix 5.8: Bat Activity Survey Data, May – October 2020;
- Appendix 5.9: Weather Station Location (edp6367_d007a 12 May 2021 MJC/KH);
- Appendix 5.10: Revised study area (edp6367_d038a 13 May 2021 MJC/KH);
- Appendix 5.11: Dormouse Tube Locations (edp6367_d004a 12 May 2021 MJC/EWi); and
- Appendix 5.12: Pond Locations within 500m (edp6367_d005a 12 May 2021 MJC/EMc).

5.2 RELEVANT LAW, POLICY AND GUIDANCE

Legislative and Planning Framework

5.2.1 In carrying out the EcIA of the Development, relevant international and national legislative instruments reflected in national, regional, county and local policies will be reviewed. These will include:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Countryside and Rights of Way Act 2000;
- The Environment (Wales) Act 2016;
- The Hedgerows Regulations 1997;
- The Protection of Badgers Act 1992;
- Environment (Wales) Act 2016;
- Future Wales: The National Plan 2040;
- Planning Policy Wales (PPW) Edition 11, February 2021 - Chapter 6: Distinctive and Natural Places;
- PPW supplementary Technical Advice Note 5 (TAN 5): Nature Conservation and Planning;
- Torfaen County Borough Council Local Development Plan (LDP) up to 2021 (adopted December 2013);
- Blaenau Gwent County Borough Council Local Development Plan (LDP) up to 2021 (adopted November 2012); and
- Supplementary Planning Guidance (SPG) – Nature Conservation Planning Guidance for Small Scale Wind Energy Developments, February 2017.

Further Guidance

5.2.2 The EcIA of the Development upon IEFs will also be undertaken with reference to:

- CIEEM (2018); Guidelines for Ecological Impact Assessment in the UK & Ireland: Terrestrial, Freshwater, Coastal and Marine;
- Joint Nature Conservation Committee (2010); Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- SNH (2019); Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation;
- Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition;
- English Nature (2006); The Dormouse Conservation Handbook;
- Oldham *et al*. (2000); Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*);
- Langton *et al*. (2001) Great Crested Newt Mitigation Guidelines, Froglife; and
- Cresswell *et al*. (1990); National Badger Survey: The history, distribution, status and habitat requirements of the Badger in Britain, Nature Conservancy Council.

5.3 ENGAGEMENT AND CONSULTATION

5.3.1 Consultation via letter was undertaken with Natural Resources Wales (NRW) in February 2021, regarding the scope of the ecological survey work completed to date and that proposed over the course of 2021, in respect of identifying important ecological receptors necessary to inform a subsequent planning application.

5.3.2 NRW returned a preliminary opinion in March 2021 (the Discretionary Advice Service was not available at the time of the request), limited to European Protected Species (EPS) and advising for liaison to be undertaken with the relevant Ecology Officers. A consultation request was therefore made to the Ecology Officers at TCBC and BGCBC in April 2021. Feedback from TCBC and BGCBC is awaited. Feedback is also sought from Statutory Consultees through the formal scoping process.

5.4 BASELINE CONDITIONS

Site Context

5.4.1 The study area, as illustrated at Appendix 5.1, occupies part of Mynydd Llanhilleth Common located between Abersychan (within TCBC) and Abertillery (within BGCBC), in addition to encompassing a former quarry and associated area of coniferous woodland across its southern extents. It lies in the centre of a large, north-south trending ridge of high land between the Cwm Afon valley (Abersychan, Pontypool etc.) to the east, and the Ebbw Fach valley (Abertillery) to the west. This ridge comprises a series of plateaux typically between 400m and 550m above sea level and is characterised by much unenclosed land grazed by sheep, and to a lesser extent cattle and horses. There is much evidence of historic industrial activity on the slopes of the ridge, particularly in the Cwm Avon valley. Areas of plantation forestry are common elsewhere on the slopes of the ridge and dry-stone walls augmented with post and wire fencing demarcate the edge of the unenclosed area from the surrounding enclosed pastures. These are managed in a relatively intensive manner and appear to be relatively species-poor.

5.4.2 A minor public highway, running north-east to south-west, from Abersychan to Llanhilleth, bisects the study area. Numerous unmetalled tracks otherwise cross the study area. A small stream/flush arises from the block of coniferous woodland/quarry area and flows southwards. Additionally, there are several waterbodies, several being located within the former quarry and created from former quarry workings.

5.4.3 Other than the coniferous plantation and former quarry dominating the southern extents of the study area, habitats supported by the wider Common area comprise five distinct plant communities: heather-dominated dry dwarf shrub heath on the areas of highest elevation; a crowberry-dominated community on elevations slightly below the heather-dominated areas; a bilberry-dominated community below that; a small area dominated by bracken in the east; and relatively species-poor acidic grassland and species-poor rush pasture across the remainder. In addition, there is an area in the north-east of the site where bracken overlies areas of both crowberry-dominated and bilberry-dominated communities.

5.4.4 There are several areas where some of these habitats/communities' intergrade or form complex mosaics but in general the main distinct habitats predominate. The most complex area of intergraded or mosaic habitat is in the south where acidic grassland and marshy grassland are very difficult to separate into distinct blocks of homogenous habitat.

Ecology Baseline

Designations

5.4.5 The South East Wales Biological Records Centre (SEWBReC) was contacted to undertake a search via Aderyn for desk study information on statutory and non-statutory designated sites on or within the vicinity of the study area. The following search radii, taken from the boundaries of the study area, was requested:

- International designations – 30km radius;
- National designations – 15km radius; and
- Local designations – 5km radius.

Statutory Designations

5.4.6 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

5.4.7 No part of the study area is covered by any statutory designations. However, there are a number of such designations within the study area's potential zone of influence, as summarised in Table 5.1 and illustrated at Appendix 5.2 and Appendix 5.3.

Figure 5-1: Statutory designations within the study area's potential zone of influence.

Designation	Distance from Site (approx.)	Brief Description
International (30km)		
Aberbargoed Grasslands SAC	6km SW	42.5ha site. Qualifying features include *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils, and it is large and relatively isolated population of marsh fritillary butterfly located across a series of damp pastures and heaths, representing the species on the eastern edge of its range.
Usk Bat Sites SAC	8km N (closest section)	The Usk Bat Sites SAC supports dry heaths, raised and blanket bogs, calcareous rocky slopes, caves and *Tilio-Acerion* forests. Lesser horseshoe bat are also a qualifying feature. The SAC supports one of the largest maternity roosts of lesser horseshoe bats and a number of important hibernacula within the cave systems, comprising up to 5% of the UK population. A number of rare plant species and whitebeams are also found located throughout the SAC.
Cwm Clydach Woodlands SAC	9km NW	Cwm Clydach is of particular importance for its stands of beech dominated woodland which also support a number of rare and scarce vascular plants and fungi assemblages.

Designation	Distance from Site (approx.)	Brief Description
River Usk SAC	10km E (closest section)	Important for its fish populations including twaite shad, allis shad, Atlantic salmon, bullhead, river lamprey, brook lamprey and sea lamprey. The site is also important for its otter population and diverse and high quality riparian habitats supported.
Sugar Loaf Woodlands SAC	14km NE	This SAC supports an internationally important area of western sessile oak woodland as well as beech plantation woodland, heathland, bracken, scrub and grassland.
Coed y Cerrig SAC	18km NE	Coed y Cerrig supports alluvial forests dominated by alder and ash.
Severn Estuary SPA/ SAC/ Ramsar	18km SE	The Severn Estuary is important for migratory birds with its tidal flats and associated wetlands regularly supporting over 20,000 wintering waterfowl. Internationally important populations of five species of waterfowl are regularly supported by the estuary. These include European white-fronted goose, shelduck, gadwall, dunlin and redshank. In addition, the islands of Flat Holm and Steep Holm support a nationally important breeding population of lesser black-backed gulls. The Severn Estuary also regularly supports an internationally important population of Bewick's swan, an Annex I species. The estuary is also of importance for migratory fish with species such as allis shad, salmon, sea trout, sea lamprey, river lamprey, twaite shad and eel. The Severn Estuary is noted for its exceptional tidal range and associated unusual estuarine communities, reduced species diversity and high productivity. The estuary supports a diverse assemblage of habitats including Atlantic salt meadows, intertidal mudflats and sandflats, reefs and subtidal sandbanks.
Cardiff Beech Woods SAC	18km SW	The SAC represents an area of semi-natural broadleaved woodland dominated by beech. Features of particular interest include *Asperulo-Fagetum* beech forests (45 ha) and *Tilio-Acerion forests* of slopes, screes and ravines (30ha).
Llangorse Lake SAC	24km NW	Important for its aquatic and marginal plants, including several that are rare in this part of Wales. The site also supports several important habitats including submerged and floating plant beds, marginal swamp, fen vegetation, marshy grassland, unimproved grassland, willow scrub and wet woodland.
Brecon Beacons SAC	26km NW	Designated for a range of habitats including calcareous and siliceous rocky slopes supporting rich flora, in addition to dry heaths and hydrophilous tall herb fringe communities of plains and of the montaine to alpine levels.

Designation	Distance from Site (approx.)	Brief Description
Cwm Cadlan SAC	26km NW	Cwm Cadlan is particularly important for its excellent examples of *Molinia* meadows and alkaline fens.
River Wye SAC	27km E	The site supports an important fish assemblage including species such as twaite shad, allis shad, Atlantic salmon, river lamprey, brook lamprey and sea lamprey. The site is also important for its otter and white-clawed crayfish populations. A diverse and high-quality riparian corridor is also supported by the SAC.
Blaen Cynon SAC	27km NW	Supports the largest metapopulation of marsh fritillary butterfly on the southern edge of the Brecon Beacons National Park.
Wye Valley and Forest of Dean Bat Sites SAC	28km E	The Wye Valley and Forest of Dean Bats SAC is situated across the Wales-England border and is underpinned by four SSSI in Wales and nine in England. The SAC is particularly important for lesser horseshoe and greater horseshoe bats with breeding colonies for both species located within the SAC.
Wye Valley Woodlands SAC	28km E	A large woodland site which has some of the best examples of *Tilio-Acerion* forests of slopes, screes and ravines, *Asperulo-Fagetum* beech forests and *Taxus baccata* woods of the British Isles. In addition, lesser horseshoe bats use the woodlands for foraging during the breeding period.
National (15km)		
Ty'r Hen Forwyn SSSI	0.7km S	Ty'r Hen Forwyn is of special interest for its species-rich neutral grassland and for the association of this habitat with others including acid grassland, scrub, bracken and well-developed hedgerows.
Cwm Merddog Woodlands SSSI	5km NW	Cwm Merddog Woodlands is of special interest for its stands of beech woodland close to the westerly limit of its geographical range. The lower slopes of the site support large areas of acid flushes with an open carr community dominated by alder and willows.
Blorenge SSSI	6km NW	A large upland site supporting sub-montane heath with large areas of *Calluna* – E*mpetrum* - *Vaccinium vitis-idaea*, a community which is of local distribution in south Wales.
Aberbargoed Grasslands SSSI/ NNR	6km SW	Aberbargoed Grasslands SSSI is of special interest for its marshy grassland communities and population of marsh fritillary butterfly. Part of Aberbargoed Grasslands SAC.
Llandegfedd Reservoir SSSI	6km E	Llandegfedd Reservoir is the largest inland open water habitat in the County and a regionally important area for overwintering wildfowl in Wales. The site is particularly important for the overall numbers and

Designation	Distance from Site (approx.)	Brief Description
		variety of wintering wildfowl, with large numbers of wigeon, pochard and mallard.
Memorial Park Meadows Pontllanfraith SSSI	7km SW	The site supports a large area of unimproved grassland made up of four fields which are the remnants of a traditionally managed farm.
Penllwyn Grasslands SSSI	7km SW	This site supports a mosaic of habitats including wet acid grassland, woodland, scrub and tall herb vegetation, alongside an extensive area of species-rich *Molinia* grassland representing the *Juncus acutiflorus – Erica tetralix* sub-community of the *Molinia caerulea – Cirsium dissectum* fen meadow type which is of very local distribution and confined to south-western Britain. The site also supports a diversity of macro-invertebrate communities with more than 12 species of butterfly and 90 species of macro-moths recorded including colonies of marsh fritillary butterfly.
Siambre Ddu SSSI	8km N	The cave at the site is of particular interest for its population of hibernating lesser horseshoe bats which is the third largest hibernation site in Gwent for lesser horseshoe bat. Part of the Usk Bat Sites SAC.
Henllys Bog SSSI	8km SE	Henllys Bog comprises a small fen with a species-rich ground flora. It is the only site in the County for marsh helleborine.
Cefn Y Brithdir SSSI	8km W	The steep slopes of Cefn Y Brithdir hill support the best example in Mid Glamorgan of a dwarf shrub heath community in which crowberry occurs as a co-dominant species.
Gilwern Hill SSSI	9km N	Gilwern Hill is particularly important for its areas of limestone grassland which support several species that are rare in the county.
Cwm Llanwenarth Meadows SSSI	9km NE	Two unimproved meadows supporting a diverse range of plant communities.
Mynydd Llangatwg (Mynydd Llangattock) SSSI (encompassing Craig Y Cilau NNR)	9km NW	A large upland site comprising mostly common land along the Powys/Blaenau Gwent County boundary. The base-rich grassland, heather dominated blanket mire, and dry heath, are of special interest. The crags, woodland and grassland of the limestone escarpments also support important assemblages of rare and scarce vascular plants, bryophytes and lichens. The site sits within the Usk Bat Sites SAC, being of special interest for its cave system which is one of the five most important hibernation sites in the UK for lesser horseshoe bat.

Designation	Distance from Site (approx.)	Brief Description
Cwm Clydach SSSI/ NNR	9km NW	Cwm Clydach is of particular importance for its stands of beech dominated woodland which also support a number of rare and scarce vascular plants including whitebeams and soft-leaved sedge. Part of Cwm Clydach Woodlands SAC.
Coed-Y-Person SSSI	10km NE	A large area of ancient semi-natural woodland on the steep north facing lower slopes of the Blorenge mountain, which includes one of the most extensive areas of coppice beech in the county.
Penpergwm Pond SSSI	10km NE	Penpergwm Pond is the best example of a natural mesotrophic water body in the county with a diverse emergent flora and a number of national and county rarities.
River Usk (Lower Usk) SSSI	10km E (closest section)	The River Usk (Lower Usk) is particularly important as a rare example of a large mesotrophic lowland river which has not been subject to significant man-made modification. The site is also important for its invertebrate assemblage, otter population, diverse flora, breeding bird assemblage and diverse and high-quality riparian habitats. Part of the River Usk SAC.
Priory Wood SSSI	11km NE	Priory Wood is assessed to be the best remaining example of ancient semi-natural woodland on the Silurian rocks of the Usk Inlier.
Nelson Bog SSSI	11km SW	Nelson Bog is of special interest for its range and diversity of mire communities. The SSSI is also an important ornithological site with over 90 species recorded.
River Usk (Upper Usk) SSSI	12km N (closest section)	The River Usk (Upper Usk) is assessed to be a fine example of an upland river flowing in part over hard sandstones, creating steeply graded sections with rocks, cascades, boulders and cliff-bound banks. The biological diversity of the site is also of partial interest with important populations of fish, breeding, birds, otter, mosses and lichen. Part of the River Usk SAC.
River Usk (Tributaries) SSSI	13km N (closest section)	The Usk system, comprising the River Usk and including its upper tributaries, represents a large, linear ecosystem that acts as an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species. The Usk tributaries support internationally important populations of otter, Atlantic salmon, bullhead, brook lamprey and river lamprey. Part of the River Usk SAC.
Plas Machen Wood SSSI	13km S	The site comprises coppice woodland dominated by alder and supporting a diverse ground flora. A number of streams and waterlogged areas support an interesting flora.

Designation	Distance from Site (approx.)	Brief Description
Ruperra Castle & Woodlands SSSI	13km S	The site is of special interest for its maternity roost of greater horseshoe bat. The buildings at Ruperra Castle support a colony of greater horseshoe bats of national and international importance. Coed Craig Ruperra, the woodland area to the north of the roost, is also well used by the bats for foraging and commuting to more distant feeding and roosting areas. Also of interest are the site's populations of great crested newt and hazel dormouse.
Sugar Loaf Woodlands SSSI	14km NE	Sugar Loaf Woodlands SSSI supports three extensive areas of ancient coppice woodland on the south and east slopes of the Sugar Loaf Mountain.
Severn Estuary SSSI	18km SE	Notified for its internationally important populations of wintering and wading birds of passage, supporting estuarine habitats of ornithological significance. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of dunlin in Britain. The SSSI also supports large populations of migratory fish and a range of saltmarsh habitats which are important for their botanical diversity, supporting several nationally scarce species. The estuary's intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. Also designated as an SPA/SAC/Ramsar site.

Non-statutory Designations

5.4.8 Non-statutory designations are also commonly referred to in planning policies as 'local sites' and are typically considered to be of importance at a County level. In the counties of Blaenau Gwent, Caerphilly and Torfaen, such designations are named Sites of Importance for Nature Conservation (SINCs). Additional designated sites which should be considered at this level include Local Nature Reserves (LNRs) and Ancient Semi Natural Woodland (ASNW), where these are not covered by other designations.

5.4.9 There are several SINCs which are partly present within the study area itself, as summarised in Table 5.2 and illustrated at Appendix 5.4.

Table 5-1: Non-statutory designations overlapping with the study area.

Designation	Local Authority	Brief Description
Local (SINC)		
Blaen-y-cwm upland pasture	Torfaen	Sheep grazed acid grassland/marshy grassland. Suitable for important bird species including hen harrier, long-eared owl, curlew and lapwing.

Designation	Local Authority	Brief Description
Blaensychan Valley	Torfaen	Post-industrial site including ancient woodland, revegetated colliery spoil, bare ground, neutral and calcareous grassland. Invertebrates supported include small pearl-bordered and dark green fritillary butterflies. The SINC is also an important site for reptile as well as flora including moonwort.
Cwm Ddu Woods, Blaenserchan	Torfaen	The SINC supports ancient woodland, dwarf shrub heath, hedgerows, colliery spoil, a stream, small ponds and disused buildings, with notable bird species recorded including yellowhammer, red grouse, long-eared owl, bullfinch, reed bunting, crossbill, spotting flycatcher, kestrel, linnet, redstart, skylark, starling, stonechat, song thrush, green woodpecker and hen harrier.
Cefn y Crib SINC	Torfaen	Acid/calcareous grassland site. Also supports ancient woodland. 12 species of sedge are supported by the site as well as grassland fungi such as earthtongues and waxcaps.
Graig Ddu/Gelli-Deg Wood	Torfaen	Ancient woodland site on relatively high ground dominated by beech and oak.
Mount View, Blaen-y-Cwm	Torfaen	Acidic grassland, partially on coal spoil, supporting species such as common bent, sheep's-fescue, heath bedstraw and tormentil.
Mulfran, Mynydd Coity, Mynydd James & Gwastad	Blaenau Gwent	Purple-moor grass and rush pastures, dwarf shrub heath and blanket bog. A mosaic of habitats of acid grassland, dry heathland, wet heath, blanket mire and marshy grassland. Notable species supported include Silurian moth, skylark and otter.
Mynydd Llanhilleth Common	Torfaen	Mosaic of upland habitat types including acid grassland, dwarf shrub heath, wet and dry heath and mire communities. Notable species supported include red grouse, wintering short-eared owl, upland breeding birds, olive earthtongue and reptiles.
Tirpentwys Cut	Blaenau Gwent	The site supports a mosaic of habitats including bog habitats and flushes, standing open water, post-industrial quarry and rock exposures. A significant site for breeding birds with several schedule 1 and notable bird species recorded within the site including peregrine falcon, goshawk, hobby, merlin, long-eared owl, reed bunting, common crossbill, cuckoo, kestrel, linnet, tree pipit, raven, redpoll and redstart.
Tirpentwys Cut	Torfaen	The site supports a mosaic of habitats including bog habitats and flushes, standing open water, post-industrial quarry and rock exposures. A significant site for breeding birds with several schedule 1 and notable bird species recorded within the site including peregrine falcon, goshawk, hobby, merlin, long-eared owl, reed

Designation	Local Authority	Brief Description
		bunting, common crossbill, cuckoo, kestrel, linnet, tree pipit, raven, redpoll and redstart.
Waun Wen & Cwmbyrgwm	Torfaen	Large expanse of dry heath / acid grassland mosaic.

5.4.10 In addition to those non-statutory sites located within the study area itself, there are numerous such designations within a 2km radius, including several blocks of ancient woodland and two local nature reserves.

Designations – IEFs

5.4.11 Assessing the habitats and species these designations support, their distance and separation from their study area, and connectivity to the study area, and subject to further refinement of the Development, the following designations summarised within Table 5.3 will be scoped into the EcIA, given the potential for direct or indirect impact pathways to occur, as a result of the Development.

Table 5-2: Potential IEFs (designated sites) within the study area's potential zone of influence.

Potential IEF	Distance from Site & Key Attributes	Nature Conservation Importance
Designated Sites		
International (30km)		
Usk Bat Sites SAC	Situated circa 8km to the north of the study area (closest section), supporting one of the largest maternity roosts of lesser horseshoe bats and a number of important hibernacula within the cave systems, supporting up to 5% of the UK population.	International
National (15km)		
Ty'r Hen Forwyn SSSI	Situated circa 0.7km to the south of the study area, and notified for its species-rich neutral grassland, acid grassland, scrub, bracken and well-developed hedgerows.	National
Siambre Ddu SSSI	Situated circa 8km north of the study area and comprising a component SSSI unit of the Usk Bat Sites SAC, supporting hibernating lesser horseshoe bats within its cave comprising the third largest hibernation site in Gwent for lesser horseshoe bat.	National
Mynydd Llangattock SSSI	Situated circa 9km to the north-west of the study area and comprising a component SSSI unit of the Usk Bat	National

Potential IEF	Distance from Site & Key Attributes	Nature Conservation Importance
(encompassing Craig Y Cilau NNR)	Sites SAC, supporting one of the five most important hibernation sites in the UK for lesser horseshoe bat.	
Local (2km)		
All SINCs overlapping with the Development or located immediately adjacent, in addition to those situated within sufficient proximity in respect of functional, ecological connectivity in respect of habitats, species populations or hydrology, will be scoped into the EcIA.		Local

5.4.12 None of the other statutory and non-statutory designations would potentially be directly or indirectly impacted by the Development due to their spatial separation from the study area, their interest features and/or lack of any habitat or hydrological connections. These sites have been scoped out of the assessment accordingly.

Habitats

5.4.13 An Extended Phase 1 survey of the study area was undertaken on the 6th, 7th and 8th April 2020 by a suitably experienced surveyor. The survey technique adopted was at a level intermediate between a standard Phase 1 survey technique[2] based on habitat mapping and description, and a Phase 2 survey, based on detailed habitat and species surveys. During the survey, all principal and priority[3] habitat types and the dominant plant species present therein were identified and mapped. Additionally, any actual or potential protected species or priority species[4] were also identified and scoped.

5.4.14 To further provide a robust assessment of habitats associated with Mynydd Llanhilleth Common specifically, a targeted botanical survey was also undertaken over contiguous areas of acid grassland, marshy grassland and dwarf shrub habitat to identify any distinct plant communities of note and to further assess the botanical value of the study area. The survey adopted the DAFOR methodology[5] whereby all vascular plant species (and bryophytes where identifiable) were identified according to their abundance. The botanical survey was undertaken on 22nd May 2020 by an

[2] Joint Nature Conservation Council (2004) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication).

[3] Habitats considered of key significance to sustain and improve biodiversity in Wales, as defined under Section 7 of Part 1 of the Environment (Wales) Act 2016

[4] Species of Principal Importance for the purpose of conserving biodiversity, as listed under Section 7 of the Environment Act (2016).

[5] DAFOR botanical survey technique – whereby occurrence of a species is noted to be Dominant, Abundant, Frequent, Occasional, or Rare. Where a species had a particularly localised status within a field it was noted with the prefix L (e.g. rare in the wider field but locally occasional = R/LO).

experienced botanist during which weather conditions were overcast, very windy, and with occasional light drizzle. The survey followed a two-month period of near-drought.

5.4.15 The distribution of different habitat types within and adjacent to the study area is illustrated at Appendix 5.5, with the findings of the targeted botanical assessment illustrated at Appendix 5.6. Descriptions of those habitats supported by the study area are further provided below.

Coniferous Woodland

5.4.16 The southern extents of the study area are characterised by a circa 75-hectare area of plantation coniferous woodland comprising predominantly Corsican pine of uniform age and structure. The canopy of the woodland edge is relatively open due to multiple fallen and storm damaged specimens, presumably due to their exposure to prevailing weather conditions. Here, a ground flora community is dominated by patches of grassland species, moss and soft rush. Internally, the woodland is very dense with few breaks in the canopy such that little light reaches the forest floor. Here, the ground is almost entirely colonised by a community of several moss species which has established over boulders and rock.

5.4.17 Linear belts of pine woodland are also present long the north-eastern boundary of the study area and have colonised the upper slopes of a steep valley which descends northwards. Such areas are contiguous with broadleaved woodland dominated by beech which has colonised the lower slopes of the valley. Otherwise, there are scattered pockets of coniferous trees across the study area. Coniferous woodland here is again dominated by Corsica pine. The woodland canopy in these areas is, however, more open, with trees more scattered.

Quarry (Former)

5.4.18 Located centrally within the coniferous woodland along the southern boundary of the study area is a deep gorge travelling east to west which has been created from historical quarrying operations. The steep cliff faces of the gorge are colonised by immature pine trees and saplings.

5.4.19 The upper slopes of the quarry faces are colonised by mature pine trees with younger trees and saplings dominating the middle slopes of the cliff face. The lower slopes are, in contrast sparsely vegetated with occasional pine saplings, silver birch, goat willow and gorse. Some grassland cover is present, albeit patchy in distribution. Grassland habitat is characterised by common bent, red fescue and false oat-grass. Otherwise, the lower slopes of the cliff and valley bottom is dominated by unvegetated scree and the remains of quarry workings.

Dry Dwarf Shrub Heath

5.4.20 The northernmost extents of the study area are dominated by dry heathland of which there are three distinct communities; heather dominated dwarf shrub; crowberry dominated shrub; and bilberry dominated shrub. Several vehicular tracks and footpaths are present throughout this area, the majority of which are circa 8m wide. There is localised evidence of degradation/disturbance of heathland communities either as a result of agricultural activities or off-road motorbikes. Indeed, off-road motorbike activity was witnessed during the survey.

5.4.21 *Heather-dominated dwarf shrub*: In the higher parts of the study area, on the summit and south-eastern slopes of Byrgwm, there is a relatively dense community of old heather bushes. Beneath them there is much crowberry and some bilberry. Acidic grassland species such as brown bent, sheep's fescue, sweet vernal-grass, mat grass, heath rush, heath bedstraw and tormentil are also present to varying degrees.

5.4.22 *Crowberry-dominated community:* This occupies the upper slopes of Brygwm below those areas occupied by heather. Apart from the paucity of heather it is very similar to the community described above except that crowberry is often abundant here, and bilberry can be frequent, more so in the heather-dominated areas.

5.4.23 *Bilberry-dominated community:* This community is found on the mid slopes of Byrgwm, typically below the heather and the crowberry-dominated communities but above the grass and herb-dominated acidic grassland. It has many of the attributes of the crowberry-dominated community described above but is marked from that by a very high frequency of another ericaceous species - bilberry; crowberry can be found here too but only in a small quantity.

Acid Grassland

5.4.24 Land associated with Llanhilleth Common is dominated by acid grassland, particularly across its northern extents, in addition to covering large areas across the southern parts of the study area. This grassland community is not especially species-rich, with typical species encountered including brown bent, sheep's fescue, sweet vernal-grass, heath rush, heath bedstraw, tormentil, mat grass, sorrel, rough meadow-grass, cocksfoot, creeping cinquefoil, pill sedge, annual meadow-grass, and common bird's-foot trefoil. Also present but much less common are species such as mouse-ear hawkweed and common *milkwort*.

5.4.25 Closer to the road which traverses Llanhilleth Common, the grassland demonstrates a slightly less acidic species composition with more meadow-grasses and less typical acidic grassland herbs; this phenomenon is common in the uplands and is caused by sheep preferentially resting and grazing adjacent to roads and thus dunging and urinating there in a greater concentration than will be found elsewhere on an upland site. This increased nutrient input favours more nutritious generalist grass species at the expense of more distinctive but less nutritious acidic grassland grasses and herbs which in turn encourages sheep to graze there and thus furthering the input of nutrients.

Marshy Grassland

5.4.26 The southern extents of Llanhilleth Common, in addition to the lower levels of the northern half of the common, supports species-poor marshy grassland. This habitat often forms a mosaic with smaller areas of species-poor acid grassland, and is dominated by soft rush, with localised frequencies of hard rush and compact rush. Heath rush and field wood rush are also occasionally recorded, with sphagnum moss also encountered. No rare or otherwise notable plant species were recorded in this community.

Improved Grassland

5.4.27 The south-western and south-eastern extents of the study area, in addition to a circa 13.4ha of land north of Cwm Ddu wood, comprise agricultural fields represented by an improved grassland community and grazed by sheep. Within these areas, perennial rye-grass is dominant whilst false oat-grass is frequent. Across this habitat, common nettle, creeping thistle and broadleaved dock occurs occasionally and are further indictors of agricultural improvement.

Bracken

5.4.28 Across the northern eastern extents of the study area, on lower slopes falling southwards towards farmed agricultural land, heather communities give way to bracken. The bracken here does not have a deep litter and may be in the initial phase of colonisation; the sward beneath is relatively species-rich in places and is divided into the crowberry-dominated and bilberry-dominated communities previously described above. Further west, bracken habitat merges with small patches of dry heath, grassland and occasional rush.

Scrub

5.4.29 Scrub habitat is typically limited in extent and associated with field boundaries, the margins of ponds and waterbodies and scattered across valley slopes and quarry faces. Dense scrub habitat is characterised by gorse and bramble although shrub species and immature trees can occur including hawthorn, willow and pine. Scrub/shrub habitat was also recorded in association with the boundaries of residential properties adjacent to the study area, and include occurrences of pedunculate oak, sycamore, wild cherry, beech and bracken.

Aquatic Features

5.4.30 There are several aquatic features within the boundaries of the study area, the majority of which are associated with the former quarry and created from former quarry workings.

5.4.31 Across the western half of the former quarry lies four aquatic features, including P1, P2, P8 and P9. P1 is large waterbody circa 245m in length and 40m wide which extends across 50% of the western quarry floor. The margins of this waterbody are largely inaccessible due to the steep quarry face. The westernmost margins of this waterbody are, however, contiguous with a small boggy area dominated by soft rush which in turn is fed by a small flush flowing along the northern edge of the quarry floor. Characterised by a clay substrate covered in submerged macrophytes and filamentous algae, the water is very clear.

5.4.32 P2 comprises a small stream/flush arising from coniferous woodland on the south-western boundary of the study area, flowing southwards. Within the study area the stream is characterised by shallow banks and flows through a small area of grassland dominated by soft rush, likely frequently inundated with changing water levels. Offsite, the watercourse becomes less vegetated with a channel substrate dominated by cobbles and gravel. Waterbody P8 comprises a much smaller, roughly circular waterbody and ditch, with marginal vegetation dominated by soft rush, and with broad-leaved pondweed occurring frequently. P9 is, in contrast, an ephemeral woodland pond which has established within a depression adjacent to a public footpath. Although shallow (0.2m deep) it is likely to hold water for the majority of year given the dominance of water starwort, an aquatic species, which has established over a silt substrate. Frog/toad spawn was recorded within this waterbody at the time of the survey.

5.4.33 Across the eastern half of the former quarry lies three further aquatic features, including P3 and P10, created from former quarry workings and which receive surface water runoff from the surrounding land, and P4 fed by a wet ditch, surrounded by waterlogged, marshy grassland dominated by soft and compact rush, with aquatic vegetation limited to broadleaved pondweed, willowherb and forget-me-not.

5.4.34 In addition to the above, and located within the southern half of Llanhilleth Common to the north-east of the former quarry, lies a ditch P7, mostly filled with soft rush, running down the northern slope towards the lip of the common overlooking the valley of Cwm Ddu. The ditch is associated with a large bank on its northern/north-eastern side which supports some relatively species-rich acid grassland (bitter vetch is locally common here). At the time of the detailed habitat surveys, the ditch was dry, but it was apparent that it typically holds some water, at least for significant periods of the year, as locally abundant populations of bog pondweed were recorded.

5.4.35 A further two waterbodies were also recorded offsite but in close proximity to the boundaries of the study area, including P5 associated with the southernmost boundary, and P6 associated with the north-westernmost boundary, comprising agricultural ponds.

Field Boundaries

5.4.36 Internal field boundaries and those around the perimeter of the study area are largely defined by unvegetated stock and rail fence lines or stone walls. Where present, native hedgerows are predominantly defunct and species-poor. Hedgerows have typically established atop historical earth/stone bank with shrubs occurring only every 5-10m. Hedgerows are dominated by hawthorn with occasional blackthorn, holly, goat willow and gorse. A ground flora community is usually representative of the surrounding grassland habitat. Where continuous sections of hedgerow occur, common ivy is dominant although bluebell and foxglove occur rarely.

5.4.37 Sheep grazed fields to the west, north and east are, in contrast defined by lines of semi-mature and mature trees dominated by beech which, in some instances are growing upon stone banks and/or walls.

5.4.38 Within Llanhilleth Common, boundary features are largely absent or limited to dry, field drains characterised by a cobble substrate but now overgrown with terrestrial vegetation include soft rush.

Ephemeral/Short Perennial Vegetation

5.4.39 Within the eastern extent of Llanhilleth Common is a relatively large area which has, presumably been cleared of grassland sometime in the past and is now colonised by a moss community with occurrences of soft rush, creeping thistle and patches of grassland species.

Buildings and Structures

5.4.40 Buildings are mostly absent onsite, although circa three clusters of built structures are present in association with the study area, albeit limited in extent and quality, with many comprising the remains of old foundations.

Habitats – IEFS

5.4.41 Subject to further survey work ongoing over the course of 2021 and further refinement of the Development, species identified as requiring assessment within the ES due to their identification as IEFs valued at or above Local level are summarised below in Table 5.4.

Table 5-3: Potential IEF (habitats) within the study area's potential zone of influence.

Potential IEF	Distance from Site & Key Attributes	Nature Conservation Importance
Habitats		
Heathland (including heathland/ bracken mosaic)	Dominates the northernmost extents of the study area and supporting three distinct communities: heather dominated dwarf shrub; crowberry dominated shrub; and bilberry dominated shrub. Localised evidence of degradation/disturbance noted due to agricultural activities or off-road motorbikes. Heather communities give way to bracken to north-east, where falling towards farmed agricultural land, exhibiting relatively species-rich sward beneath.	Up to International
Acid grassland	Land associated with Llanhilleth Common is dominated by acid grassland which is not especially species-rich, subject to sheep grazing.	Up to County
Marshy grassland	The southern extents of Llanhilleth Common, in addition to the lower levels of the northern half of the common, supports species-poor marshy grassland. This habitat often forms a mosaic with smaller areas of species-poor acid grassland.	Local
Quarry and associated coniferous woodland	Former quarry located centrally within coniferous woodland, forming a deep gorge exhibiting steep cliff faces. Upper slopes colonised by mature pine trees, middle slopes dominated by younger trees and saplings, lower slops sparsely vegetated with occasional saplings and grassland cover, but otherwise comprising unvegetated scree and remains of quarry workings. Coniferous woodland blocks otherwise relatively uniform in age and structure, dominated by Corsican pine and relatively dense with few breaks in canopy.	Local
Hedgerows, scrub, tree lines and broadleaved woodland	Where present, in association with agricultural fields, native hedgerows predominantly defunct and species poor. Field boundaries across agricultural land otherwise defined by lines of semi-mature and mature trees dominated by beech. Features largely absent across the common itself. Linear belts of pine woodland forming the north-eastern boundary are contiguous with broadleaved woodland dominated by beech. Scrub habitat also recorded in association with the boundaries of residential properties adjacent to the study area.	Site to Local
Aquatic features	Several water bodies associated with the former quarry and created from former quarry workings, varying in size, permanency, and water quality. Waterbodies across the western half include those fed by small flushes/streams arising from coniferous woodland. Those across the eastern half are primarily fed by surface water runoff. Wet and dry ditches also present.	Local

5.4.42 The valued habitats noted above, together with other habitats within the study area of low or negligible intrinsic value, may also have the potential to support protected and/or priority species. This is discussed further below.

Species

5.4.43 SEWBReC was contacted to undertake a search via Aderyn for desk study information on species records on or within the vicinity of the study area. The following search radii, taken from the boundaries of the study area, was requested:

- All bat species - 10km radius; and
- All other protected and priority species – 2km radius.

Roosting and Commuting Bats

5.4.44 The desk study returned multiple bat activity records within 10km of the study area, representing a combined total of 13 species as well as numerous records relating to myotid and pipistrelle bat species. Bat species records are relatively evenly distributed within 10km of the study area; however, there are noticeable concentrations of bat species records around urban settlements and lower elevations, the majority of which relate to small numbers of commuting/foraging bats. Bat species records become noticeably sparse at higher elevations with only a single record for a noctule and common pipistrelle within the boundary of the study area. However, despite limited records for the study area itself, there are several records relating to common pipistrelle, brown long-eared bat, lesser horseshoe and myotid bat species roosts from within a variety of structures situated between Pontypool and Talywain, with the closest confirmed roost supporting low numbers of lesser horseshoe bats approximately 900m to the north-east of the study area's eastern boundary.

5.4.45 With respect to roosting bats, a common pipistrelle and noctule were recorded to be roosting onsite within Tirpentwys Quarry during 2011. In addition, roosts comprising low numbers of common pipistrelle, lesser horseshoe and brown long-eared bat are present within 2km of the study area. The closest of these relates to a pipistrelle maternity roost located approximately 700m to the north-west of the study area within the village of Six Bells. Further afield and within 10km of the study area, numerous roosts relating to Brandt's, brown long-eared, common pipistrelle, Daubenton's, greater horseshoe, lesser horseshoe, myotid, Natterer's, noctule, pipistrelle, serotine, soprano and whiskered bat are present.

5.4.46 As for Annex II[6] bat species, several roosts for both lesser horseshoe and greater horseshoe bat are located within 10km of the study area. The majority of these records are associated with built structures at Pontypool and Cwmbran, with a cluster of roosts also identified along the section of the A465 between Brynmawr and Gilwern. Those records along the A465 corridor are primarily associated with the nearby cave network, road culverts and disused railway tunnels and have been

[6] Annex II species comprise those listed under Annex II of the Habitats Directive which occur in the UK and for which SACs are designated. The objectives of the National Site Network, which includes all SACs and SPAs, are to maintain or, where appropriate, restore such species to a favourable conservation status. In respect of bats, these include greater horseshoe, lesser horseshoe, barbastelle and bechstein's bats.

identified through long-term detailed surveys and monitoring associated with the dualling of the A465. Comparatively, there are significantly fewer greater horseshoe records compared to lesser horseshoe records with those for greater horseshoe predominantly confined to the Brynmawr to Gilwern A465 corridor, with a record for a bat roosting within a cave close to Blaenavon and a night roost located at a farm near Llandegveth. No records for barbastelle bat or Bechstein's bat within 10km of the study area were returned during the desk study.

5.4.47 The scope of detailed bat survey work undertaken of the study area during 2020 has been devised in accordance with best practice guidance[7] and is further detailed below.

Bat Activity Surveys – Walked Transect Surveys

5.4.48 Suitable linear features such as hedgerows and tree lines are limited to agricultural parcels occurring across the north-western and south-eastern peripheries of the study area. Whilst potentially offering suitable flight lines for the local bat population, such features are notably defunct and gappy. Nevertheless, a significant block of coniferous woodland associated with the former quarry and aligning the northern peripheries of the study area are present.

5.4.49 As such, and in accordance with best practice guidance (SNH, 2019), manual bat transect surveys (initially comprising four walked transect routes during May 2020, before being adapted to three transect routes over the remainder of the survey season due to health and safety reasons), encompassing the central woodland/quarry area and agricultural land adjacent were undertaken at monthly intervals between May and October 2020. Given the presence of records for horseshoe bats within the locality, surveys commenced from just before dusk and lasted for approximately three hours. During the surveys, transect routes were walked at a slow and steady pace, with all bats activity, and their behaviour marked on survey maps to characterise the value of the site and its component habitats to foraging and commuting bats.

5.4.50 Activity surveys were conducted using Batlogger detectors and observations of the time, location and activity of all bats seen or heard were noted. Bats were identified on the basis of their characteristic echolocation calls, which were recorded and analysed using computer sonogram analysis (BatExplorer) to confirm species identification. Species of myotid bats and long-eared bats are difficult to tell apart solely from their echolocation calls and were therefore grouped as such.

5.4.51 Transect routes walked during the 2020 surveys are illustrated at Appendix 5.6.

[7] Scottish Natural Heritage (2019). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

Bat Activity Surveys – Automated Static Detector Surveys

5.4.52 In accordance with best practice guidance and given the nature of habitats occurring onsite coupled with the presence of known bat roosts within the locality, bat activity within the study area was also sampled using static detectors which automatically trigger and record bat echolocation calls. In accordance with best practice guidance, one detector per turbine location requires deploying, with additional detectors requiring deployment where necessary so as to capture all suitable habitats and topographical features encompassed by the study area. Whilst the number and locations of turbines proposed across the study area had yet to be defined at the time of the survey, up to seven turbines were assumed. To ensure comprehensive coverage of all suitable habitats across the study area however, a total of nine detectors were deployed during 2020, as illustrated at Appendix 5.7.

5.4.53 Automated static detectors were deployed across the study area at monthly intervals between May and October 2020 for a minimum of ten consecutive nights each. Full spectrum detectors were used, comprising Anabat Swift detectors. On each occasion, detectors were fixed securely in their location, with an external microphone attached circa 1m - 3m above ground and directed away from vegetation to maximise detection sensitivity.

5.4.54 The echolocation calls recorded by the Anabat Swift Detectors were filtered specifically for each of the UK's bat species using Insight software. The parameters for the noise filter are based on that proposed by Chris Corben and Kim Livengood[8]. All files passing the various filters were checked manually in Insight as well as in accordance with published parameters[9] to confirm the species identification of each bat call.

Bat Activity Surveys – Initial Findings (May – October 2020)

5.4.55 A total of nine bat species/species groups (Myotis and Plecotus species were not always identified to species level) have been recorded foraging and/or commuting across the study area between May and October 2020, including the following species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared, myotid, noctule, serotine, greater horseshoe and lesser horseshoe bat.

5.4.56 Preliminary analysis of the data collected to date illustrates that on average, circa 600 bat registrations were recorded per automated detector per month, with levels of activity greatest during the month of August followed by May. The vast majority of registrations recorded by the automated detectors relate to common pipistrelle bat (87%), which was similarly the case in respect of the walked transect surveys (94%). Myotid, noctule and soprano pipistrelle bat otherwise dominate the remainder of bat registrations in respect of the automated detectors (5.6%, 3.7% and 1.6% respectively), with soprano pipistrelle, myotid and noctule bat dominating the remainder of bat registrations in respect of walked transects (2.8%, 1.3% and 1.2% respectively).

[8] Taken from Making an Antinoise Filter presentation from 2010 Annual Bat Conference
[9] Russ (2012). *British Bat Calls, a guide to species identification*. Pelagic Publishing, Exeter

5.4.57 Long-eared, lesser horseshoe, serotine, greater horseshoe and Nathusius' pipistrelle bats were otherwise infrequently recorded, comprising only circa 2.1% of registrations recorded by the automated detectors and 0.7% of registrations recorded during the walked transect surveys. With respect to Nathusius' pipistrelle, this species was registered by a single automated detector in June and September 2020. With respect to greater horseshoe bat, registrations were recorded by automated detectors in July, August and September only.

5.4.58 A summary of the initial findings collated between May and October 2020 are provided at Appendix 5.8. Further detailed analysis of data collected remain ongoing at the time of writing.

Bat Activity Surveys – Weather Data

5.4.59 A weather station was deployed onsite on 14th August 2020 to enable recordings of temperature, wind speed and direction, humidity, rainfall and atmospheric pressure to be taken on an hourly basis (Appendix 5.9). The weather station is subject to a maintenance check on a roughly fortnightly basis, with the data downloaded during each visit. The weather station will remain onsite until at least August 2021 so as to ensure a full year's worth of weather data is captured.

5.4.60 The weather station comprises a Davis Vantage Vue 6250UK mounted on a Davis Mounting Tripod 7716, which is pegged into the ground to remain sturdy. The data logger itself is stored in a weatherproof Davis 6614 Solar Power Kit Shelter, powered by a 6v lead-acid battery which is kept topped up by a 5W solar panel.

Bat Roost Surveys – Initial Bat Building Assessments

5.4.61 To determine the potential impacts of the Development on bats potentially roosting within built structures, pertinent features (including natural rock, quarries etc., where feasible) were subject to a visual assessment by an NRW bat licensed ecologist and assistant on 9th March 2021. With reference to best practice guidance[10]. a survey buffer extending 280m from each proposed turbine location (i.e. 200m buffer plus turbine rotor blade radius, assumed to be 80m) was applied, within which all built structures were subject to assessment where accessible. Additionally, given that turbine locations remain indicative at this early stage in the design of the Development, built structures within 200m of the revised study area[11] (Appendix 5.10) were also subject to assessment where accessible.

[10] Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: January 2019.
[11] Field surveys completed during 2020 were undertaken across a study area which has recently been broadened to encompass additional land parcels necessary to accommodate the emerging proposals.

5.4.62 Due to Covid-19 restrictions, the visual assessment was limited to an external assessment only, during which recorded any evidence of, or potential of each built structure to support roosting bats, in accordance with best practice guidelines12. The exterior walls and roofs of the structures assessed were viewed from ground level, with the following features searched for: cracks/holes in the stone/brick/wood work; gaps under roof or ridge tiles; loose/lifted lead flashing or roofing felt; cavity walls with potential access points; gaps between lintels above doors and windows; gaps between the barge or soffit boards and outside walls; and cracks between the window frames and walls. Possible bat access points around the eaves and barge boarding were also noted, and areas where bat droppings could accumulate such as on the ground, ledges, window sills and walls were also inspected.

Bat Roost Surveys – Initial Bat Tree Assessments

5.4.63 To determine the potential impacts of the Development on bats potentially roosting within trees, all pertinent trees were subject to a ground level visual assessment by an NRW bat licensed ecologist and assistant on 2nd March, 9th March and 7th April 2021 for the presence of, or potential to support roosting bats. With reference to best practice guidance[13]. a survey buffer extending 130m from each proposed turbine location (i.e. 50m buffer plus turbine rotor blade radius, assumed to be 80m) was applied, within which all suitable trees were subject to assessment where accessible. Where groups of trees, particularly coniferous woodland blocks, were encountered, an assessment was made of the tree group's potential to support roosting bats, rather than an assessment of each individual tree.

5.4.64 All trees were searched as thoroughly as possible from ground level, with the use of binoculars, torch and endoscope. Suitable features sought for durin the assessment included: loss/peeling/fissured bark; natural rot/woodpecker holes; cracks/splits or hollow trunks/limbs; and thick stemmed ivy/epicormic growth. Signs of roosting bats sought for included: bat(s) roosting in situ; bat droppings wihtin or beneath a feature; staining around/beneath a feature; oily marks around roost acess points; audible squeeking from the roost; odours produced by large/regularly used roosts; and flies around the roost, attracted by the smell of guano.

Bat Roost Surveys – Initial Findings

5.4.65 The survey identified six buildings with moderate potential to support roosting bats and a single building with low potential. A further seven buildings are assessed to have negligible potential to support roosting bats. Furthermore, disused quarries associated with Tirpentwys Cut SINC are assessed to offer high bat roost potential.

5.4.66 In respect of trees, a total of 123 trees were identified as supporting suitable, potential roost features for bats. Of these, 23 are assessed to have high potential, 62 have moderate potential, and a further 38 are assessed to have low potential to support roosting bats. The remaining trees, particularly coniferous woodland blocks, were assessed as having negligible potential.

[12] Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

[13] Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: January 2019.

Dormouse Surveys

5.4.67 Two desk study records were returned for dormouse, the most recent recorded in 2003 and relating to a licence return, associated with a block of woodland situated circa 5km south of the study area. Habitat connectivity between the study area and the recorded location is limited onsite, whilst habitats supported by the study area are generally assessed as being sub-optimal for this species. Nevertheless, to ensure a robust approach a presence/absence survey was undertaken over the course of 2020, limited to surveying areas of woodland associated with the former quarry and along the north-eastern boundary of the study area.

5.4.68 A total of 150 standard nest tubes, each comprising a wooden tray and nesting tube made from plastic tree guard material[14], were deployed at approximately 20m intervals on 28th April 2020, as illustrated at Appendix 5.11. Given the general absence of hazel across the study area, no systematic search for gnawed hazelnuts could be undertaken alongside the tube surveys.

5.4.69 Nest tubes were erected at approximately 1.5m to 2m above ground and tied to suitable horizontal branches located within the hedgerows or lower branches of trees. Tubes were left *in situ* and checked at regular intervals during suitable weather conditions for evidence of continued use by dormouse on five separate occasions to date on 28th May, 28th August, 25th September, 19th October and 27th November 2020. Evidence such as the presence of individuals, nests and/or food caches was recorded during each of the surveys. Incidental sightings or evidence of wood mice or other small mammals were also recorded during the surveys, during which all tubes were emptied of wood mouse nests and individuals, cleaned and re-hung.

5.4.70 During the surveys, no evidence of dormouse was recorded for the study area. This was similarly the case in respect of wood mouse and other small mammals. In accordance with best practice guidance, whereby the index of probability in detecting dormouse presence within nest tubes is calculated according to set scores given for each of the different months (for a minimum deployment of 50 nest tubes), the total survey effort score employed is considered to be sufficient and robust to assume likely absence of this species across the study area, with survey effort exceeding the minimum point score of 20, as summarised in Table 5.5.

[14] Specifications as per Mammal Society nest tube product

Table 5-4: Index of probability of finding dormice present in nest tubes in any one month.

Month	Index of Probability	Nest tubes checked	Survey Date
April 2020	n/a	*Nest tubes deployed*	28.04.20
May 2020	4	✔	28.05.20
August 2020	5	✔	28.08.20
September 2020	7	✔	25.09.20
October 2020	2	✔	19.10.20
November 2020	2	✔	27.11.20
Total survey effort score	20 points per 50 tubes - equates to a total point score of 60 for 150 tubes surveyed		

5.4.71 Based upon the findings to date, dormice have been assessed to be likely absent from the study area and will thus be scoped out from further detailed assessment within the EcIA.

Great Crested Newt Surveys

5.4.72 A desk study assessment returned no records for great crested newt within a 2km radius of the study area. There is, however, a record for great crested newt located approximately 2.5km to the south of at Pen-y-caeau farm. However, numerous barriers of dispersal, most notably the A472 Road, are present between this record and the study area.

5.4.73 As for smooth and palmate newt, there are several records for both species within a 2km radius of the study area with palmate newt being the recorded most frequently. The vast majority of palmate records are located within 1km of the study area and given the lack of barriers to dispersal between those records and waterbodies onsite it has been assessed that palmate newt are likely present within the study area itself.

5.4.74 A total of ten waterbodies (P1 - P10) are present within the study area, as illustrated at Appendix 5.12, primarily situated in and around the central quarry area. Whilst no desk study records were returned for great crested newt in association with the study area itself, a cluster of records occur circa 2.5km south. As such, further detailed surveys for this species were undertaken, as further detailed below.

Habitat Suitability Index Assessment

5.4.75 A Habitat Suitability Index (HSI) assessment, as developed by Oldham et al. (2000)15, of each waterbody onsite (P1-P10) was initially undertaken on 29th April 2020 by a suitably qualified and NRW licensed ecologist and assistant to assess their suitability to support great crested newt. The HSI assessment follows standardised assessment criteria using habitat features such as water quality, fish/waterfowl presence and surrounding terrestrial habitat quality to derive a suitability score, or 'index'. Water bodies with high scores are considered more likely to support great crested newt compared to those with lower scores.

5.4.76 The habitat suitability assessment confirmed P10 to be of 'excellent' suitability to support great crested newt, whilst P1, P2, P2A, P3 and P7 are assessed to have 'good' suitability. In addition, P4 and P7A are assessed to be of 'average' suitability, whilst P8 is of 'below average' suitability and P6 and P9 of 'poor' suitability. No access was available to P5 however, being located offsite and within private land, such that a habitat suitability assessment of this waterbody could not be undertaken.

Environmental DNA Sampling

5.4.77 Environmental DNA (eDNA) is DNA that is collected from the environment in which an organism lives. In aquatic environments, animals including amphibians shed cellular material into the water via their saliva, urine, faeces, skin cells, etc. This eDNA may persist for several weeks, and can be collected through a water sample, and analysed to determine if the target species of interest (great crested newt) is/has been present in the water body.

5.4.78 To confirm the presence/absence of great crested newt, waterbodies P1-P4 and P7-P10 associated with the study area were subject to water sampling for eDNA on 29th April 2020 by a suitably qualified and NRW licensed ecologist and assistant. Water sampling for eDNA of two waterbodies P5 and P6 could not be undertaken however due to no access being available to P5, whilst P6 did not hold water at the time of the survey.

5.4.79 Sampling was completed in accordance with those methodologies set out by the Freshwater Habitats Trust[16] and using separate sterile equipment packs for the collection of eDNA samples. 20 water samples were collected from selected areas evenly spread around the accessible perimeter of each pond including both open water and vegetated areas. Each sample was subject to real-time polymerase chain reaction (PCR) analysis as detailed within Biggs *et al*. (2014)[17].

5.4.80 No evidence of great crested newt eDNA was recorded for any of the ponds surveyed. Analysis was conducted in the presence of the following controls: extraction blank; and appropriate positive and negative PCR controls for each of the TaqMan assays (great crested newt, inhibition, and degradation), with all controls noted to have performed as expected. Based upon the findings to date, great crested newt are assessed to be likely absent from the study area and will thus be scoped out from further detailed assessment within the EcIA.

5.5 OTHER SPECIES

Badger

5.5.1 A total of three records for badger were returned during the desk study assessment, the most recent of which is dated 2007 and relates to a sighting from within an area of farmland located approximately 2km to the east of the study area, to the east of the village of Brynithel.

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[15] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt* (Triturus cristatus). Herpetological Journal 10 (4), 143-155

[16] GCN eDNA protocol, P. Williams, Freshwater Habitats Trust. August 2013

[17] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

5.5.2 The remaining two records relate to a road casualty discovered along a section of the Hafodrynys A472 Road during 2002 and a pre-2000 sighting relating to an individual at an area of farmland located approximately 850m to the north-east of the study area.

5.5.3 Badger activity within the study area was assessed during the Extended Phase 1 survey on 6th, 7th and 8th April 2020. Any signs of badger activity such as holes, latrines, trails, snuffle holes and hairs on fencing or vegetation were recorded. Where holes of a size and shape consistent with badgers were identified, the following signs of badger activity were searched for in order to determine whether they were currently in active use: Fresh spoil outside entrances; old bedding material (typically dried grass) outside entrances; holes being cleared of leaf litter; badger guard hairs; and fresh tracks leading to/from the holes.

5.5.4 No evidence of badger activity or their setts were recorded during the initial survey nor on subsequent survey visits to the study area over the course of 2020. Based upon the findings to date, badgers are assessed to be likely absent from the study area and will thus be scoped out from further detailed assessment within the EcIA.

Otter and Water Vole

5.5.5 Numerous records relating to otter field signs (predominantly spraints) were returned during the desk study assessment, the majority of which are associated with the River Ebbw located approximately 1km to the west of the study area. This includes a collection of nine spraint sites found along a section of this river close to the village of Aberbeeg, located approximately 1.4km to the west of the study area. The most recent otter record returned is dated April 2015 and relates to the discovery of an otter spraint associated with a stream located approximately 2.4km to the north-east of the study area, to the west of the village of Varteg. In relation to water vole, no records for this species were returned within a 2km radius of the study area.

5.5.6 Several waterbodies were recorded within the survey area which were assessed for their suitability for otter and water vole. With the exception of a small stream which flows southwards offsite from its headwaters at the southern extent of coniferous woodland habitat, all aquatic features comprise standing waterbodies (lakes and ponds).

5.5.7 Waterbody P1, comprising the largest of those recorded within the Quarry, provides potential habitat for otter as well as a potential foraging resource. Smaller ponds within the quarry (P8, P3, P10) provides additional aquatic habitat of value as a potential foraging resource only, whilst adjacent coniferous woodland provides suitable cover for resting and breeding. There are, however, no significant inflows and outflows and/or surface water connections between these waterbodies and aquatic features in the wider landscape (such as the River Ebbw and its tributaries), such that any dispersal of otter between those waterbodies onsite and those in the wider landscape are considered unlikely. This is with the exception of P2, contiguous with a small stream/flush which flows southwards. Within the study area this stream is characterised by shallow banks and flows through a small area of grassland dominated by soft rush, likely frequently inundated with changing water levels. Offsite, the watercourse becomes less vegetated with a channel substrate dominated by cobbles and gravel. Such habitat is assessed to of potential value for the dispersal of otter southwards but provides limited cover/features for resting/laying up. All remaining waterbodies are assessed to be of negligible value for otter being small in size, ephemeral and subject to drying in the summer months and/or isolated from large bodies of flowing water which are likely to comprise the core range for this species.

5.5.8 With respect to water vole, waterbodies are largely considered of negligible importance, particularly given the absence of any surface water connectivity between onsite ponds and suitable aquatic habitat in the wider landscape. In the absence of such connections, former excavation and mining operations within the quarry precludes the presence of water vole within waterbodies P1, P3, P8 and P10 whilst the stony bankside substrate is assessed to be largely unsuitable for burrowing. P7 and P9 are ephemeral in nature, of shallow water depth and with no/limited suitable vegetation of value for cover and a foraging resource. In contrast, P4, P5 and P6 comprise permanent/semi-mature waterbodies. Nevertheless, a diverse macrophyte community of value as a foraging resource is either absent or suppressed by proliferate scrub whilst banksides are relatively shallow or flush with the water's edge and of limited suitability for the burrowing.

5.5.9 Based upon the findings to date, otter and water vole are assessed to be likely absent from the study area and will thus be scoped out from further detailed assessment within the EcIA.

Reptiles

5.5.10 A number of records for common lizard and slow-worm occurring within and adjacent to the study area were received during the desk study assessment. The most recent common lizard record retrieved during the desk study assessment relates to an individual seen within Tirpentwys Cut SINC located within the southern portion of the study area. As for slow-worm, the most recent record is dated 2017 and relates to a sighting of six individuals from within the Blaensychan Valley located adjacent to the eastern boundary of the study area. Whilst the majority of records relate to small numbers of slow-worm, approximately 30 individuals were recorded during a 2007 survey located approximately 800m to the north-east of the study area, at an area of old ironworks known as the 'British'.

5.5.11 A single record for grass snake was also returned, located approximately 1.6km to the north-east of the study area, near the village of Talywain. As for adder, despite suitable habitat onsite and within the wider landscape, no records for this species occurring within 2km of the study area were received.

5.5.12 During the course of the 2020 surveys undertaken across the study area, incidental sightings of common lizard were recorded on several occasions within suitable habitat, mostly moorland, across the site.

Invertebrates

5.5.13 With respect to invertebrates, the desk study returned several records of notable invertebrate species, mostly of the order lepidoptera, within a 2km radius of the study area. Of those lepidoptera, SEWBReC returned several records of priority butterfly species including grayling, dingy skipper, grizzled skipper, high brown fritillary, marsh fritillary, pearl-bordered fritillary, small blue, small heath, small pearl-bordered fritillary and wall. Of those, grayling, dingy skipper, small heath and small pearl-bordered fritillary have all been recorded within the study area itself. No moth species were returned for the study area itself; however, several priority moth species have been recorded within 2km of the study area, with concentrations of recordings within the villages of Trevethin, Talywain and Aberbeeg located approximately 1.9km to the east, 800m to the east and 1.8km to the west of the study area respectively.

5.5.14 In addition to the above, several notable dragonfly and damselfly species were returned from within a 2km radius of the study area. Of these, emperor dragonfly, golden-ringed dragonfly, black darter,

keeled skimmer, common darter, common hawker, large red damselfly, broad-bodied chaser and scare blue-tailed damselfly have all been recorded within the study area itself, with records predominantly associated with Tirpentwys Cut SINC.

Species IEFs

5.5.15 Subject to further survey work ongoing over the course of 2021 and further refinement of the Development, species identified as requiring assessment within the EcIA due to their identification as IEFs valued at or above Local level are summarised below in Table 5.6.

Table 5-5: Potential IEFs (species) within the study area's potential zone of influence.

Potential IEF	Distance from Site & Key Attributes	Nature Conservation Importance
Species (excluding birds)		
Roosting, commuting and foraging bats	Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, long-eared, myotid, noctule, serotine, greater horseshoe and lesser horseshoe bat recorded foraging and commuting across the study area to date. Numerous trees and built structures with potential to support bats also present across the study area.	Local
Common reptiles	Presence of a common reptile population assumed based on local records and habitat suitability, with incidental sightings of common lizard recorded across the study area.	Local
Invertebrates	Assumed presence of priority species based on local records and habitat suitability. Likely they can be scoped out of the EcIA.	Local

5.5.16 Based on desk study and field data collated during the 2020 surveys, and in consideration of the suitability of habitats supported by the study area, it has been assessed that dormouse, great crested newt, badger, otter and water vole can be scoped out as IEFs requiring further assessment as part of the EcIA.

5.5.17 However, assessment will also need to be undertaken for additional potential impacts arising from the Development in respect to aspects of development design which have yet to be defined, such as: access routes; additional ancillary development (including those aspects potentially subject to a separate consenting regime, e.g. future grid connection points); and in respect of the proposed construction programme.

5.6 ASSESSMENT METHODOLOGY

Extent of the Study Area

5.6.1 Ecological field surveys undertaken to inform the assessment will cover the study area boundary and, in some instances, adjacent habitats, to provide contextual information and/or to ensure species populations are assessed adequately. Field surveys completed during 2020 were undertaken across a study area which has recently been broadened to encompass additional land parcels necessary to accommodate the emerging Development. Field surveys proposed throughout 2021 will be undertaken across this revised study area, as illustrated at Appendix 5.10.

5.6.2 An ecological desk study of the study area commenced in April 2020. As details of the Development had yet to be defined, precautionary search radii from the study area boundary were employed, as follows: 30km for statutory designated sites of international importance; 15km for sites of national importance; 5km for sites of local importance; 6km for Annex II bat species records; 2km for all other protected/priority species records; and 500m in respect of identifying waterbodies with potential to support great crested newt.

5.6.3 In light of the emerging Development, search radii in respect of statutory designations will be further refined to: 5km where bats (and birds) are not a qualifying feature; 10km where lesser horseshoe bat is a qualifying feature; 20km where barbastelle bat and greater horseshoe bat is a qualifying feature; and up to 20km where hydrological impact pathways are possible between the designation and the study area. These search areas reflect the sensitivity and value of potential ecological receptors and are considered to be sufficient to cover the potential zone of influence of the Development on these receptors, while providing contextual information to assist with determining and evaluating the baseline.

5.6.4 The extent of the impact assessment will be defined as the Zone of Influence (ZoI). The ZoI will be determined through a review of the baseline ecological conditions relative to the emerging Development and consideration of the proposed activities, as well as through liaison with other specialists involved in assessing the impacts of the Development as considered within the ES and other supporting documentation.

Collection of Baseline Information

5.6.5 In respect of identifying IEFs to inform the EcIA, the following ecological (excluding birds) surveys have been undertaken across the study area:

- Desk study & Extended Phase 1 habitat survey (April 2020);
- Botanical survey of grassland and heathland habitats occurring across the study area, associated with Mynydd Llanhilleth Common (May 2020);
- Badger survey (April 2020);
- Bat activity surveys (May – October 2020):
  - Walked transect surveys; and
  - Automated static detector surveys;
- Preliminary bat roost surveys (March – April 2021):
  - External building assessment; and
  - Ground level tree assessment;
- Dormouse surveys (April – November 2020); and
- Great crested newt surveys (April 2020):
  - Habitat Suitability Index assessment; and
  - Environmental DNA sampling.

5.6.6 To further determine and refine those IEFs to be scoped into the assessment, whilst taking into account revisions to the study area boundaries (Appendix 5.10) and emerging details of the Development, further surveys are proposed over the course of 2021, as follows:

- Update Extended Phase 1 Habitat survey in respect of additional land parcels encompassed by the revised study area, and further broadened to encompass any further land included in respect of the Development footprint;
- Update botanical survey of additional, sensitive habitats encompassed by the revised study area, where highlighted by the update Extended Phase 1 habitat survey;
- Update bat activity surveys, comprising the deployment of 12 automated detectors across the study area, one per proposed turbine location, at monthly intervals between May and September/October 2021 equating to five occasions for a period of ten nights each;
- Bat activity and roost surveys, comprising a combination of walked, stationary and back-tracking surveys once per month between May and August 2021, targeting sensitive features across the study area including the quarry and key tree lines/woodland edges considered to have potential to support roosting bats;
- Bat building roost surveys, comprising a combination of dusk emergence and dawn re-entry surveys of all built structures initially assessed as having potential to support roosting bats situated within 280m (200m buffer plus 80m turbine rotor blade radius) of proposed turbine locations;
- Bat tree roost surveys, with trees previously identified during the preliminary ground level tree assessment as supporting potential roost features for bats and occurring within 130m (50m buffer plus 80m turbine rotor blade radius) of the proposed turbine locations, subject to repeat inspections using an endoscope from the ground and/or at height through aerial climbing;
- Update great crested newt surveys of additional ponds identified within 500m of the revised study area, comprising Habitat Suitability Index assessments and environmental DNA sampling; and
- Pilot invertebrate survey of targeted areas identified during the Extended Phase 1 and botanical surveys to assess the potential of onsite habitats to support a notable invertebrate population.

5.6.7 Reptile surveys have been scoped out based on assumed presence of common lizard, slow-worm and grass snake, with potential for adder to also be present. Rather, the adoption of a precautionary approach to mitigation during construction will be taken, to ensure the avoidance of impacts upon common reptiles. This is considered appropriate given the extent of suitable habitats present across the study area and beyond, relative to the localised nature of impacts arising from the Development.

5.6.8 Otter and water vole surveys have been scoped out based on the absence of desk study records within the study area, in addition to the lack of significant inflows and outflows and/or surface water connections between those aquatic features present onsite to those within the wider landscape which could otherwise facilitate their dispersal. Aquatic features onsite are also predominantly associated with the former quarry, where stony bankside substrates are largely unsuitable for water vole burrowing.

Limitations and Assumptions

5.6.9 To ensure transparency in the EcIA, any assumptions or limitations in the collation of baseline information will be highlighted and a precautionary approach to the assessment of potentially significant effects and mitigation adopted. To date, the following limitations and assumptions have been identified:

- The desk-based assessment relies on available data, and best endeavours have been made to ensure that the data is accurate and up to date. It is assumed that information provided during the desk study is accurate;
- Access to certain parts of the study area or pertinent nearby ecological features (e.g. ponds) has not been possible in all instances due to health and safety limitations or where access from private landowners cannot be gained. Where possible/necessary, habitats were otherwise mapped from adjacent public rights of way or accessible land, and/or through use of aerial photography. Any such constraints will be highlighted, and a precautionary approach adopted with regards to the presence/valuation of species and potential for significant effects to arise;
- Species are mobile and surveys therefore only provide a snapshot of the conditions present across the study area at the time of survey with a precautionary approach adopted based on habitat suitability and records of species locally;
- The identification of bat species using call analysis software is dependent upon the quality of the recording made and it is not possible to identify certain families (e.g. myotid and long-eared bats) to species level; and
- In certain instances, survey effort may not accord to best practice guidance in respect of survey scope or timings. Rather, pilot surveys may be deemed sufficient in light of the specific IEF assessed in consideration of the Development. Equally, the scope of survey effort may necessarily be reduced so as to target a representative sample of key features as a result of health and safety considerations or where otherwise justifiable/unavoidable in respect of the emerging Development and potential impacts otherwise predicted to arise.

5.7 APPROACH TO METHODOLOGY

Evaluation Methodology

5.7.1 The evaluation of IEFs will be made with reference to the guidelines published by the CIEEM. The guidelines propose an approach to valuing ecological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being assessed. In addition, best practice guidance in relation to survey techniques and mitigation measures will also be taken into account.

Geographical Context

5.7.2 The Guidelines recommend that the value or potential value of the important ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used: International; National (Wales); Regional (South East Wales); County (Torfaen and Blaenau Gwent); and Local.

Valuing Designated Sites

5.7.3 Within the UK, certain valued habitats have been assigned a level of nature conservation value through designation; and the guidelines referred to above recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites (SACs, SPAs and RAMSAR sites);
- Nationally important sites (SSSIs, NNRs and LNRs); and
- Regional/County/District important sites (SINCs).

5.7.4 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Habitats and Species

5.7.5 The guidelines require consideration of all protected species as ‘important’ features where there is the potential for a breach in legislation. Additionally, both species and habitats should be assessed according to their biodiversity value, measured against published selection criteria where available, such as those protected under the Conservation of Habitats and Species Regulations 2017 (as amended), or those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act 2016. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection, whilst using any relevant published evaluation criteria available at the time of assessment. Where habitats do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Characterising Potential Impacts

5.7.6 The guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the Development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features as well as further consideration of impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the ZoI during the lifetime of the Development.

5.7.7 When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters: positive or negative; extent; magnitude; duration; timing; frequency; and reversibility.

Significance Criteria

5.7.8 The guidance defines an ecologically significant impact as an 'effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general'. Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential IEF, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.

5.7.9 Although certain species and habitats may not constitute IEFs based upon their nature conservation value they may still warrant assessment during the design and mitigation of the Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.

5.7.10 The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.

5.7.11 The significance of the potential impacts upon IEFs will be assessed both before and after the consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the Development. Consideration will also be given to the potential future impacts to IEFs arising as a result of global trends and climate change.

5.7.12 Additionally, and in accordance with Conservation of Habitats and Species Regulations 2017 (as amended), screening will also be required to determine if likely significant effects upon pertinent designated sites comprising the National Site Network (i.e. SACs and SPAs) would arise as a result of the Development and, if this is the case, for an appropriate assessment (AA) to be undertaken. Whilst the Habitats Regulations Assessment is the responsibility of the Competent Authority, information to inform this process will be prepared.

5.8 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

5.8.1 Consideration will be given to the following potential effects upon IEFs:

- Construction:
  - Temporary and permanent habitat loss, including SINC designated land, due to the construction of turbine bases, access routes and required development of other structures/ancillary works;
  - Disturbance/displacement of fauna (visual, noise);
  - Sedimentation and pollution (dust generation, pollution of aquatic habitats);
  - Temporary lighting disturbance; and
  - Construction site hazards (increased vehicle movements).
- Operation:
  - Displacement of fauna from usual foraging and migratory routes;
  - Disturbance of fauna during maintenance works; and
  - Mortality of fauna due to collision with turbines or as a result of barotrauma.
- Decommissioning:
  - As per construction phase.

5.9 CUMULATIVE & IN-COMBINATION EFFECTS

5.9.1 The EcIA will give due consideration to potential in-combination or cumulative effects resulting from other development proposals within the ZoI. In respect of IEFs, consideration will be given to such developments within the same range of mobile species (e.g. bats) or shared hydrological catchment. In respect of developments to be included within the cumulative assessment, this will include: schemes which are operational or under construction; schemes which have been granted planning permission but are not yet constructed/operational; and proposals for which consent has been applied but which await determination (including those subject to determination at appeal). Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain, and/or in respect of potential development relating to pre-assessed areas defined within Future Wales: The National Plan 2040.

5.10 EFFECTS SCOPED OUT

5.10.1 As set out previously above, formal surveys for reptile, otter and water vole will be scoped out. Additionally, based upon survey findings collated to date, it has been assessed that dormouse, great crested newt and badger can also be scoped out as IEFs within the EcIA.

5.11 APPROACH TO MITIGATION

5.11.1 The mitigation hierarchy will be adopted, following the sequential process of avoidance, mitigation and compensation. Inherent in the design of the Development will be the avoidance of impacts upon IEFs as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure. Where such impacts cannot be altogether avoided however, mitigation will be implemented to ensure such impacts are reduced as far as possible so as to minimise harm upon IEFs. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been taken into account. Additionally, enhancement measures will also be implemented so as to ensure overall net benefit to biodiversity are achieved.

5.11.2 Avoidance, mitigation, compensation and enhancement measures to be implemented as part of the Development will be informed by those ongoing ecological field surveys of the study area, as detailed previously above, alongside further consideration of the Development as they evolve. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Method Statement detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a habitat management plan detailing those management, maintenance and monitoring measures requiring delivery over the lifetime of the Development.

5.12 QUESTIONS FOR CONSULTEES

Question 5.1	Do consultees consider the study area appropriate?
Question 5.2	Do consultees consider the scope of the baseline surveys and those methodologies employed to date sufficient and proportionate in respect of the Development?
Question 5.3	Do consultees consider the scope of the further detailed surveys proposed sufficient and proportionate in respect of the Development?
Question 5.4	Do consultees agree with the statutory and non-statutory sites to be scoped in / out of the assessment?
Question 5.5	Do consultees agree with the IEFs to be scoped in / out of the assessment?
Question 5.6	Do consultees require for the delivery of any specific mitigation with respect to those protected or priority species and habitats identified for the study area to date?
Question 5.7	Are there any other relevant consultees who should be consulted about this topic?

6 ORNITHOLOGY

6.1 INTRODUCTION

6.1.1 The Ornithology Chapter of the Environmental Statement will be prepared by competent experts from the Environmental Dimension Partnership Ltd (EDP), who are full members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and have significant experience of Ornithology Impact Assessment (OIA) for a range of schemes, including wind farms. The chapter will be prepared with reference to The CIEEM's Ecological Impact Assessment Guidelines (2018).

6.1.2 The Ornithology Chapter will provide an Ornithology Impact Assessment (OIA) of the potential effects of the Development on important ornithological features (IOFs) such as designated sites for birds and bird assemblages or species. Non-avian Ecology and Nature Conservation matters will be considered separately in Chapter 5.

6.1.3 The chapter will describe: the baseline conditions at the EIA site and surroundings; the assessment methodology; the potential significant ornithology effects of the Development; and the proposed approach to mitigation required to otherwise prevent, reduce or offset any significant negative effects.

6.1.4 The approach proposed in this Scoping Report has been informed by ongoing desk studies, field surveys, consultation, reference to published best practice guidance and professional judgement. Where 'significant' effects cannot be avoided through inherent design, the OIA will recommend additional mitigation and/or compensation measures.

6.1.5 A description of the Project Site, nature and purpose of the Development is provided in Chapter 3.

6.1.6 This chapter should be read in conjunction with Chapter 5 Ecology and Biodiversity and the following, accompanying appendices:

- Appendix 5.2: Internationally Designated Sites (edp6367_d013a 13 May 2021 MJC/KH);
- Appendix 5.3: Nationally Designated Sites (edp6367_d014a 13 May 2021 MJC/KH);
- Appendix 5.4: Non-statutory Designated Sites (edp6367_d015a 13 May 2021MJC/KH);
- Appendix 5.5: Phase 1 Habitat Survey (edp6367_d002a 12 May 2021 MJC/EWI);

6.1.7 Additionally, this chapter should be read in conjunction with the following appendices specific to this chapter:

- Appendix 6.1: Core Study Area in 2020 and 2021 (edp6367_d042a 13 May 2021 MJC/RF);
- Appendix 6.2: Moorland Breeding Bird Transect Routes (edp6367_d012a 13 May 2021 MJC/RF);
- Appendix 6.3: Raptor Survey Route and Vantage Points (edp6367_d011a 13 May 2021 MJC/RF);
- Appendix 6.4: Nightjar and Owl Transect Routes (edp6367_d010a 13 May 2021 MJC/RF)
- Appendix 6.5: Vantage Point Locations and Zones of Theoretical Visibility (edp6367_d001b 13 May 2021 MJC/RF);
- Appendix 6.6: Winter Transect Routes (edp6367_d043a 04 May 2021 MJC/RF);
- Appendix 6.7: Hen Harrier Vantage Points and Transects (edp6367_d044a 13 May 2021 MJC/RF)

6.2 RELEVANT LAW, POLICY & GUIDANCE

Legislative and Planning Framework

6.2.1 In carrying out the OIA of the Development, relevant international and national legislative instruments reflected in national, regional, county and local policies will be reviewed. These will include:

- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- The Countryside and Rights of Way Act 2000;
- The Environment (Wales) Act 2016;
- Future Wales: The National Plan 2040;
- Planning Policy Wales (PPW) Edition 11, February 2021 - Chapter 6: Distinctive and Natural Places;
- PPW supplementary Technical Advice Note 5 (TAN 5): Nature Conservation and Planning;
- Torfaen County Borough Council Local Development Plan (LDP) up to 2021 (adopted December 2013);
- Blaenau Gwent County Borough Council Local Development Plan (LDP) up to 2021 (adopted November 2012); and
- Supplementary Planning Guidance (SPG) – Nature Conservation Planning Guidance for Small Scale Wind Energy Developments, February 2017.

Further Guidance

6.2.2 The OIA of the Development upon IEFs will also be undertaken with reference to:

- CIEEM (2018); Guidelines for Ecological Impact Assessment in the UK & Ireland: Terrestrial, Freshwater, Coastal and Marine;
- Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2 (Scottish Natural Heritage 2017);
- Windfarms and Birds: Calculating a theoretical collision risk assuming no avoiding action (SNH 2000);
- Assessing Significance of Impacts from Onshore Windfarms on Birds outwith Designated Areas (SNH 2006);
- Assessing the cumulative impacts of windfarms (SNH 2012);
- Hardy *et al* (2013) Raptors: a field guide to survey and monitoring, 3rd edition;
- Gilbert *et al* (1998) Bird monitoring methods;
- Bibby *et al* (2000) Bird census and survey techniques;
- Barn Owl Trust (2012) Barn Owl Conservation Handbook;
- Hötker *et al* (2006): Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. Michael-Otto-Institut im NABU, Bergenhusen;
- Pearce-Higgins *et al* (2009) The distribution of breeding birds around upland wind farms. Journal of Applied Ecology 46: pp 1323-1331;
- Douglas *et al* (2011) Changes in the abundance and distribution of upland breeding birds at an operational wind farm. Bird Study 58: 37–43;

- Pearce-Higgins *et al* (2012). Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a multi-site and multi-species analysis. Journal of Applied Ecology 49: 386-394; and
- Band *et al* (2007) Developing field and analytical methods to assess avian collision risk at wind farms. Birds and Wind Farms. Quercus, Madrid. 259-275.

6.3 ENGAGEMENT & CONSULTATION

6.3.1 Consultation via letter was undertaken with Natural Resources Wales (NRW) in February 2021, regarding the scope of the ornithology survey work completed to date and that proposed over the course of 2021, in respect of identifying important ornithology receptors, including target species, necessary to inform a subsequent planning application.

6.3.2 NRW returned a preliminary opinion in March 2021 (the Discretionary Advice Service was not available at the time of the request), limited to European Protected Species (EPS) and advising for liaison to be undertaken with the relevant Ecology Officers. A consultation request was therefore made to the Ecology Officers at TCBC and BGCBC in April 2021. Feedback from TCBC and BGCBC is awaited. Feedback is also sought from Statutory Consultees through the formal scoping process.

6.4 BASELINE CONDITIONS

Site Context

6.4.1 The core study area occupies part of Mynydd Llanhilleth Common located between Abersychan (within TCBC) and Abertillery (within BGCBC), in addition to encompassing a former quarry and associated area of coniferous woodland across its southern extents. Core study area boundaries subject to survey during 2020 and 2021 are illustrated at Appendix 6.1. The common comprises of a mosaic of sheep grazed heathland and grass pasture of variable botanical interest, as described in more detail in Chapter 5 and illustrated in Appendix 5.5.

6.4.2 A minor road bisects the western extent of the study area, and the open access land, as well as being used for sheep grazing, is used for recreational activities such as running, dog walking, mountain biking and motor biking, with associated potential for disturbance of bird interest.

6.4.3 The landscape context and habitats within the study area, which are described in detail in Chapter 5, afford breeding, roosting and foraging opportunities for a range of bird species, including species that may be at risk from a development of this nature such as waders, raptors and owls.

Establishing the Baseline

6.4.4 The baseline conditions have been established through a desk study and a suite of ornithology field surveys which commenced in April 2020 and are ongoing. A second year of bird data is in the process of being collated. Further details on the scope of survey work are provided in the Assessment Methodology sub-section that follows, specifically Table 6.7.

6.4.5 The surveys have encompassed a core study area (Appendix 6.1), and wider study area as applicable to potential zone of influence of the Development to particular species or species groups. These are hereafter referred to as the ‘study area’ and ‘wider study area’ respectively.

Designations

6.4.6 The South East Wales Biological Records Centre (SEWBReC) was contacted to undertake a search via Aderyn for desk study information on statutory and non-statutory designated sites on or within the vicinity of the study area. The following search radii, taken from the boundaries of the study area, was requested:

- International designations – 30km radius;
- National designations – 15km radius; and
- Local designations – 5km radius.

Statutory Designations

6.4.7 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International ornithology designations include Special Protection Areas (SPAs) and Ramsar Sites. National designations for birds can include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

6.4.8 No part of the study area is covered by any statutory designations. However, there are a number of such designations within the study area's potential zone of influence that include bird species in their citations, as summarised in Table 6.1 and previously illustrated at Appendix 5.2 and Appendix 5.3 of Chapter 5.

Table 6-1: Statutory ornithology designations within the study area's potential zone of influence

Designation	Distance from Study Area (approx.)	Brief Description
International (30km)		
Severn Estuary SPA/ Ramsar	18km SE	The Severn Estuary is important for migratory birds with its tidal flats and associated wetlands regularly supporting over 20,000 wintering waterfowl. Internationally important populations of five species of waterfowl are regularly supported by the estuary. These include European white-fronted goose, shelduck, gadwall, dunlin and redshank. In addition, the islands of Flat Holm and Steep Holm support a nationally important breeding population of lesser black-backed gulls. The Severn Estuary also regularly supports an internationally important population of Bewick's swan, an Annex I species.
National (15km)		
Llandegfedd Reservoir SSSI	6km E	Llandegfedd Reservoir is the largest inland open water habitat in the County and a regionally important area for overwintering wildfowl in Wales. The site is particularly important for the overall numbers and variety of wintering wildfowl, with large numbers of wigeon, pochard and mallard.

Designation	Distance from Study Area (approx.)	Brief Description
Blorenge SSSI	6km NW	A large upland site supporting sub-montane heath with large areas of Calluna – Empetrum - Vaccinium vitis-idaea, a community which is of local distribution in south Wales. Supports a locally important population of red grouse.
River Usk (Lower Usk) SSSI	10km E (closest section)	The River Usk (Lower Usk) is particularly important as a rare example of a large mesotrophic lowland river which has not been subject to significant man-made modification. The site is also important for its invertebrate assemblage, otter population, diverse flora, breeding bird assemblage and diverse and high-quality riparian habitats. Part of the River Usk SAC.
Nelson Bog SSSI	11km SW	Nelson Bog is of interest for its range and diversity of mire communities. The SSSI is also an important ornithological site with over 90 species recorded.
River Usk (Upper Usk) SSSI	12km N (closest section)	The River Usk (Upper Usk) is considered to be a fine example of an upland river flowing in part over hard sandstones, creating steeply graded sections with rocks, cascades, boulders and cliff-bound banks. The biological diversity of the site is also of partial interest with important populations of fish, breeding, birds, otter, mosses and lichen. Part of the River Usk SAC.
River Usk (Tributaries) SSSI	13km N (closest section)	The Usk system, comprising the River Usk and including its upper tributaries, represents a large, linear ecosystem that acts as an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species. The Usk tributaries support internationally important populations of otter, Atlantic salmon, bullhead, brook lamprey and river lamprey. Part of the River Usk SAC.
Severn Estuary SSSI (Flat Holm and Steep holm)	18km SE	Notified for its internationally important populations of wintering and wading birds of passage, supporting estuarine habitats of ornithological significance. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of dunlin in Britain.

6.4.9 Considering the ornithology species the statutory designations support, their distance and separation from the study area, the ongoing survey findings and the habitat opportunities for species within the study area (e.g. absence of notable water bodies), only the Severn Estuary Ramsar and SSSI has been scoped into the OIA on a precautionary basis. This is because there is some, albeit relatively limited, potential for gulls from breeding colonies at Flat Holm and Steep Holm SSSIs to forage as far inland as the Development and various gull species have been recorded during the survey work. This includes lesser black-backed gull, the breeding population of which is a designated feature.

Non-statutory Designations

6.4.10 Non-statutory designations are also commonly referred to in planning policies as 'local sites' and are typically considered to be of importance at a County level. In the counties of Blaenau Gwent, Caerphilly and Torfaen, such designations are named Sites of Importance for Nature Conservation (SINCs). Additional designated sites which should be considered at this level include Local Nature Reserves (LNRs), where these are not covered by other designations.

6.4.11 Those SINCs which are partially or wholly designated for their bird interests and partly present within the study area itself, are summarised in Table 6.2 and illustrated at Appendix 5.4.

Table 6-2: Non-statutory designations located partly within or adjacent to the study area with birds in their citation

Designation	Local Authority	Brief Description
Blaen-y-cwm upland pasture	Torfaen	Sheep grazed acid grassland/marshy grassland. Suitable for important bird species including hen harrier, long-eared owl, curlew and lapwing.
Cwm Ddu Woods, Blaenserchan	Torfaen	The SINC supports ancient woodland, dwarf shrub heath, hedgerows, colliery spoil, a stream, small ponds and disused buildings, with notable bird species recorded including yellowhammer, red grouse, long-eared owl, bullfinch, reed bunting, crossbill, spotting flycatcher, kestrel, linnet, redstart, skylark, starling, stonechat, song thrush, green woodpecker and hen harrier.
Mulfran, Mynydd Coity, Mynydd James & Gwastad	Blaenau Gwent	Purple-moor grass and rush pastures, dwarf shrub heath and blanket bog. A mosaic of habitats of acid grassland, dry heathland, wet heath, blanket mire and marshy grassland. Notable species supported include Silurian moth, skylark and otter.
Mynydd Llanhilleth Common	Torfaen	Mosaic of upland habitat types including acid grassland, dwarf shrub heath, wet and dry heath and mire communities. Notable species supported include red grouse, wintering short-eared owl, upland breeding birds, olive earthtongue and reptiles.
Tirpentwys Cut	Blaenau Gwent	The site supports a mosaic of habitats including bog habitats and flushes, standing open water, post-industrial quarry and rock exposures. A significant site for breeding birds with several

Designation	Local Authority	Brief Description
		schedule 1 and notable bird species recorded within the site including peregrine falcon, goshawk, hobby, merlin, long-eared owl, reed bunting, common crossbill, cuckoo, kestrel, linnet, tree pipit, raven, redpoll and redstart.
Tirpentwys Cut	Torfaen	The site supports a mosaic of habitats including bog habitats and flushes, standing open water, post-industrial quarry and rock exposures. A significant site for breeding birds with several schedule 1 and notable bird species recorded within the site including peregrine falcon, goshawk, hobby, merlin, long-eared owl, reed bunting, common crossbill, cuckoo, kestrel, linnet, tree pipit, raven, redpoll and redstart.

6.4.12 All of the non-statutory designations set out in Table 6.2 are proposed to be scoped into the OIA owing to their proximity to the study area and the potential for direct or indirect impacts upon the ornithology interests they support as a result of the Development.

6.4.13 Subject to the ongoing survey work findings, the final design and consultation, it may be possible to scope out further designations from the OIA.

Target Species

6.4.14 With reference to best practice guidance, the surveys and subsequent assessment will focus on species drawn from the following four lists:

- EU Birds Directive (79/409/EEC);
- Wildlife and Countryside Act (1981);
- Red-listed and amber-listed birds of Conservation Concern in Wales/UK[18]; and
- Priority Species under Section 7 of the Environment Wales Act (2016)[19].

6.4.15 Species contained within these lists that by virtue of their breeding, roosting, feeding or migrating behaviour that may be sensitive to the Development will be identified as target species for assessment purposes. Consideration will also be given to species identified locally as of conservation concern within the Gwent Bird Report[20].

[18] Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018) *The state of birds in Wales 2018*. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff.
[19] Section 7 Species of Principle Importance in Wales, *Environment (Wales) Act* 2016; and Schedule 1 of *Wildlife and Countryside Act* 1981 (as amended)
[20] Gwent Bird Report 2018.

6.4.16 With reference to best practice guidance, conservation concern passerine species (e.g. skylark and meadow pipit) have been scoped out as target species to be assessed within the OIA, except where significant habitat loss/disturbance impacts could potentially arise during vegetation clearance, construction and decommissioning. This is because such species are generally not considered to be at risk of impacts from the operational turbines.

6.4.17 With regards to target species, it is proposed that buzzard, sparrowhawk and raven are scoped out of the baseline recording and future collision risk analysis due to their lack of conservation status, as reflected by their common and widespread distribution.

Summary of Year 1 Survey Results

Moorland Breeding Bird Surveys

6.4.18 With reference to best practice guidance, four breeding bird surveys of moorland habitats were completed during the 2020 breeding season, with repeat survey effort ongoing during 2021. A total of three target species were recorded in 2020 over the survey visits. Of those, all three species are regarded to be of conservation concern within Wales, including red and amber listed species. Of these species, none were confirmed to be breeding within the either the study area or wider study area, with snipe considered to be possibly breeding within the study area and herring gull and lesser black-backed gull considered to be non-breeders.

6.4.19 Those target species recorded during the breeding bird survey visits are listed, along with their onsite breeding status, Welsh conservation status and regional status in Table 6.3.

Table 6-3: Target bird species recorded during the moorland breeding bird surveys, their status within the study area and their legal protection.

Species	Conservation Status[21][22]	Gwent Status[23]	Recordings During the Survey and Likely Breeding Status
Herring gull	Section 7 Red List	Fairly common all year; distinct spring passage; moderate nos. breed, mainly in industrial areas	Two birds were seen flying within the northern extent of the study area during the second visit along with a further one bird seen in flight within a similar location during the fourth visit. Non-breeder.
Lesser black-backed gull	Amber List	Fairly common; distinct spring passage; modest but growing nos. breed, most in industrial areas	Two birds seen flying within the study area during the second and third survey visits with a further individual seen heading west through the study area during the fourth survey visit. Non-breeder.

[21] Section 7 Species of Principle Importance in Wales, *Environment (Wales) Act* 2016; and Schedule 1 of *Wildlife and Countryside Act* 1981 (as amended)

[22] Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018) *The state of birds in Wales 2018*. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff.

[23] Statements referring to the county (Gwent) status of each species were obtained from the Gwent Bird Report 2018.

Species	Conservation Status[2122]	Gwent Status[23]	Recordings During the Survey and Likely Breeding Status
Snipe	Amber List	Fairly common winter visitor; uncommon breeder	Two individuals, possibly representing a pair, were recorded within marshy grassland habitat located at the south-east corner of the study area during the first survey visit only. Possible breeder.

6.4.20 The diversity and abundance of species recorded has been assessed to be below average for an area of this size and habitat composition. Additionally, it was noted that the study area is well-used by the Amber-listed skylark and meadow pipit during the breeding season.

6.4.21 It is worth noting that the study area, due to its locality close to urban areas, is subject to high levels of recreational use, primarily by walkers, runners and mountain bikers, but also frequent motor cross bikes and drone flying. As such, breeding species are subject to high levels of recreational disturbance, likely reflected by the limited number of target species recorded across the moorland. This disturbance may have been exacerbated by the Covid-19 pandemic, resulting in increased recreational use of the area.

Raptor Surveys

6.4.22 As detailed in Table 6.4, a total of six species of raptors were recorded within the wider study area during the three survey visits completed with reference to best practice guidance during the 2020 breeding season.

Table 6-4: Raptors recorded during the raptor survey visits, their status within the wider study area and their legal protection.

Species	Conservation Status	Gwent Status	Recordings During the Survey and Likely Breeding Status
Buzzard	Green List	Common breeding resident	[redacted]

Species	Conservation Status	Gwent Status	Recordings During the Survey and Likely Breeding Status
Goshawk	Green List Schedule 1	Uncommon breeding resident	[redacted]
Kestrel	Red List Section 7	Fairly common breeding resident, though declining markedly for the last two decades	[redacted]
Peregrine	Green List Schedule 1	Resident and winter visitor	[redacted]
Red kite	Amber List Schedule 1	Scarce visitor and passage migrant; rare breeding resident	[redacted]

Species	Conservation Status	Gwent Status	Recordings During the Survey and Likely Breeding Status
Sparrowhawk	Green List	Breeding resident	[redacted]

6.4.23 [redacted]

6.4.24 [redacted]

Nightjar and Owl Surveys

6.4.25 Only one target species was recorded during the four dawn and dusk survey visits during the 2020 breeding season, namely long-eared owl, as summarised in Table 6.5. No evidence of nightjar was recorded within the wider study area during the dawn and dusk survey visits.

Table 6-5: Nocturnal species recorded during the dawn and dusk survey visits, their status within the survey area and their legal protection.

Species	Conservation Status	Gwent Status	Recordings During the Survey and Likely Breeding Status
Long-eared owl	Amber List	Scarce breeding resident and winter visitor	[redacted]

6.4.26 [redacted]

6.4.27 [redacted]

Vantage Point Surveys

6.4.28 A total of 72hrs of survey from three different vantage points (VPs) have been undertaken between April 2020 and March 2021 with reference to SNH guidance 2017. A summary of the target species and number of flights recorded during the 36 hours of VP surveys in the 2020 breeding season is provided below:

- Lesser black-backed gull – 43 flights;
- Red kite – 41 flights;
- Herring gull – 37 flights;
- Peregrine – 10 flights;
- Kestrel – 4 flights;
- Goshawk – 2 flights;
- Cormorant – 1 flight; and
- Heron – 1 flight.

6.4.29 The frequency of red kite, peregrine and goshawk activity recorded is reflective of the species respective hunting behaviour and confirmed or probable breeding within or adjacent to the study area, as identified through the other breeding bird surveys.

6.4.30 The relatively low number of kestrel flights suggest that the study area forms only part of the local population's wider foraging resource.

6.4.31 The frequency of gull activity relates to movement across the wider landscape and some opportunistic foraging on agricultural land adjacent to the study area. The study area is not, however, considered to lie on a key commuting route for these species, nor provides significant foraging opportunities during the breeding season, as reflected by the relatively low number of flights recorded.

6.4.32 The single cormorant and heron flights relate to individual birds passing through the study area. As such, these species do not require further assessment as IOFs.

6.4.33 The 36 hours of winter and migratory VP surveys have yet to be fully analysed; however, the most notable recordings included a hunting male hen harrier recorded on 26th November 2021 and 5th March 2021. Other target species were similar to the breeding season VPs, with herring and lesser black-backed gull the most commonly recorded species, and red kite, peregrine and kestrel the most frequently recorded raptors.

6.4.34 The most frequently recorded non-target species during the VP surveys were buzzard and raven. As stated previously, owing to their common and widespread status, both locally and nationally, it is proposed that these species are scoped out of the OIA.

Winter Transect Surveys

6.4.35 Six winter transect surveys were completed between November 2020 and March 2021. These surveys focused on open moorland habitat across the study area to further investigate its potential to support over wintering or passage migrant target species. A summary of the target species and wider assemblage recorded, is provided below.

6.4.36 Only a single short-eared owl was observed flying north through the study area on 2nd March 2021. Given the absence of other recordings during the winter transect surveys and other ongoing bird surveys more generally, many of which were timed to be crepuscular, it is considered that this was a migrant bird passing through the study area. As such, subject to any further recordings, short-eared owl is proposed to be scoped out of the OIA.

6.4.37 A hunting male hen harrier was recorded during the winter transects on 27th February 2021 and 19th March 2021. A male hen harrier was also recorded within the site on two occasions during the non-breeding season vantage point surveys on 26th November 2021 and 5th March 2021. Two further incidental recordings were also made for this species, with a male hen harrier seen hunting throughout the study area on 29th November 2020 and 2nd March 2021. It is considered likely that these sightings relate to the same male bird which appears to be utilising the study area and wider study area as part of its hunting range during migration and potentially winter.

6.4.38 Other raptors recorded within the study area during the winter transects included peregrine, goshawk, kestrel and red kite.

6.4.39 No significant flocks of waterfowl or waders were recorded during the winter transect surveys; however, the wider study area was recorded to support small numbers of snipe and woodcock, with peak counts of five and two respectively. In addition, a cormorant was seen flying through the study area on 19th March 2021. Individuals as well as small flocks of lesser black-backed gull and herring gull were also seen flying through the study area on several occasions during the winter transects.

6.4.40 Other recordings made within the wider study area include several Red-list and Amber-list bird species of conservation concern in Wales, the most pertinent of which being a peak count of three red grouse. The remaining records relate to non-target passerines species, including records for the Schedule 1-listed common crossbill, redwing and fieldfare. Common crossbill was primarily associated with coniferous woodland, whereas redwing and fieldfare were predominantly seen moving through the study area in small to medium-sized flocks.

6.4.41 Overall, the winter bird assemblage supported by the study area appears to be relatively limited in abundance with only modest species diversity given the extent of area and range of habitats. This may be a reflection of the degraded nature of the moorland habitats present and/or recreational disturbance which remained high over the winter. Despite this, a number of target species were recorded, most notably hen harrier, which will require assessment within the OIA.

Hen Harrier Roost Surveys

6.4.42 In light of the occasional recording of an overwintering/migrant hen harrier, targeted surveys were completed at dusk and/or dawn between January and March 2021, as detailed further below in Table 6.7, to identify any roosting sites within the study area or surrounding landscape.

6.4.43 No hen harriers were seen during the targeted hen harrier roost surveys. The latest hen harrier recording made during the other suite of ornithology surveys was at 5pm on 27th February 2021, around 10 minutes before sunset. The bird was tracked to beyond 2km of the northern boundary of the study area in the direction of Mynydd Coety, before disappearing from sight.

6.4.44 In light of these findings, overwintering hen harriers are not considered to roost within or adjacent to the study area.

Barn Owl Surveys

6.4.45 The building and tree inspections for nesting and roosting birds did not identify any evidence of barn owls. The majority of buildings were considered to have low potential for this species however, although access was not possible in respect of some of the buildings situated within 200m of the study area. A number of trees with notable cavities that could afford opportunities were also noted but no evidence of barn owls recorded. The location of trees and buildings are illustrated in Appendix 5.11 and 5.12, with further details provided in the Ecology and Biodiversity Chapter 5 in respect of the preliminary bat roost inspections.

6.4.46 Barn owls have not been recorded during any of the other ongoing ornithology and ecology surveys, which include considerable amounts of surveyor time within the study area around dusk and dawn. Barn owl are therefore considered to be unlikely to breed within the study area and are currently scoped out of the OIA.

Summary of Ornithology IOFs

6.4.47 Subject to further survey work ongoing over the course of 2021 and further refinement of the Development, designations and species identified as requiring assessment within the OIA due to their identification as IOFs valued at or above Local level are summarised below in Table 6.6.

Table 6-6: Potential IOFs within the study area's potential zone of influence

Potential IEF	Status	Nature Conservation Importance
Designations		
Severn Estuary Ramsar / SSSI	Potential for gulls from breeding colonies at Flat Holm and Steep Holm SSSIs to forage as far inland as the Development. The breeding population of lesser-black backed gull is a designated feature, and the species has been recorded flying through the Study Area. Subject to further surveys, it may be possible to scope out these designations.	National to International
SINCs (within or immediately adjacent to the core study area)	All SINCs overlapping with the core study area or located immediately adjacent, in addition to those situated within sufficient proximity in respect of functional, ecological connectivity in respect bird species populations, will be scoped into the OIA.	Local to County
Species		
Hen Harrier	[redacted]	Local to County
Red Kite	[redacted]	Local
Peregrine falcon	[redacted]	Local
Goshawk	[redacted]	Local
Kestrel	[redacted]	Site to Local
Snipe	[redacted]	Local
Lesser Black-backed Gull	Frequently recorded in flight throughout the study area with foraging recorded on adjacent land.	Site to Local
Herring Gull	Frequently recorded in flight throughout the study area with foraging recorded on adjacent land.	Site to Local

6.4.48 Based on desk study and field data collated during the 2020 surveys, and in consideration of the suitability of habitats supported by the study area, it is considered likely that other bird species can be scoped out as IOFs requiring further assessment as part of the OIA. However, this will be subject to completion of the baseline surveys and agreement with consultees.

6.4.49 Consideration will also need to be given to additional potential impacts arising from the Development in respect of aspects of development design which have yet to be defined, such as: access routes; additional ancillary development (including those aspects potentially subject to a separate consenting regime, e.g. future grid connection points); and in respect of the proposed construction programme.

6.5 ASSESSMENT METHODOLOGY

Extent of the Study Area and Zone of Influence

6.5.1 Field surveys completed during 2020 were undertaken across a core study area which has recently been broadened to encompass additional land parcels necessary to accommodate the Development. Field surveys proposed throughout 2021 will therefore be undertaken across this revised core study area (see Appendix 6.1 for comparative core study areas subject to survey). Owing to those broad survey areas previously covered during the bird surveys undertaken during 2020, as further set out below, it is considered that sufficient survey coverage has been given to date in respect of the revisions to this study area. Nevertheless, minor updates to the survey areas and associated transects are proposed in 2021 to account for such changes.

6.5.2 Given to the mobile nature of birds, the ornithology field surveys undertaken to inform the assessment cover the core study area and wider study area as applicable to potential zone of influence of the Development to target species or species groups, with reference to best practice guidance. For example, in respect of moorland birds and raptors, the wider study area has included a survey buffer extending circa 800m and 2000m from the study area respectively.

6.5.3 An ornithology desk study of the study area commenced in April 2020. As details of the Development had yet to be defined, precautionary search radii from the study area boundary were employed, as follows: 30km for statutory designated sites of international importance; 15km for sites of national importance; 5km for sites of local importance and 2km for protected/priority bird species records.

6.5.4 These search areas reflect the sensitivity and value of potential ecological receptors and are considered to be sufficient to cover the potential zone of influence of the Development on these receptors, while providing contextual information to assist with determining and evaluating the baseline.

6.5.5 The extent of the impact assessment will be defined as the Zone of Influence (ZoI). The ZoI will be determined through a review of the baseline ecological conditions relative to the Site and assessment of the Development, as well as through liaison with other specialists involved in assessing the impacts of the Development as considered within the ES and other supporting documentation.

Collection of Baseline Information

6.5.6 In respect of identifying IOFs to inform the OIA, a desk study and a suite of bird surveys have been completed, as set out below.

Desk Study

6.5.7 An ornithology desk study commenced in March 2020 and included requesting protected/notable species records from the following parties:

- South East Wales Biological Records Centre (SEWBReC) (10km radius from the study area);
- RSPB (2km) – no data received;
- British Trust for Ornithology (2km) – confirmed all data is passed to SEWBReC; and
- Gwent Ornithological Society (2km) – still awaiting response.

6.5.8 The desk study has, and will, also include a review of extant planning applications within the vicinity of the study area, including the quarry workings and other wind farm proposals, where the ornithology information is publicly available from the planning portal:

Bird Surveys

6.5.9 Initial bird scoping exercises were completed in March 2020 to identify the suitability of the study area and surrounding landscape for potential target bird species and to ground-truth vantage point locations following some initial desk-based data collation and viewshed analysis. This site visit, alongside the desk study, were used to identify the potential target species and the appropriate scope of survey work.

6.5.10 The ornithology surveys commenced in April 2020 and it is intended, with reference to best practice (SNH 2017), that two years of data is collected to inform the Development. Some refinement of the survey work is proposed in year two to reflect the ongoing survey findings and small changes to the study area. A summary of the completed and ongoing surveys is provided in Table 6.7.

Table 6-7: Summary of the ornithology bird survey scope

Survey Type	Survey Methodology	Timing
Moorland Breeding Bird Surveys	Four visits to within 200m of all suitable moorland habitat within an 800m radius of the study area, where access allowed (see Appendix 6.2 for the indicative transect route). Surveys were completed using an adapted Brown & Shepherd (1993) methodology to map the breeding territories of upland waders, such as snipe, curlew and lapwing. With reference to best practice guidance the surveys were timed between 08.30 and 18:00 and undertaken during suitable weather conditions i.e. days/periods with strong winds and heavy or persistent rain were generally avoided. The 2021 surveys have been expanded to include some additional non-moorland improved grassland habitats and increase survey coverage.	Mid-April to early July 2020; Repeated in 2021
Raptor Surveys	With reference to SNH guidance (2017) and standard methodology (Hardey *et al*., 2013), evidence for breeding goshawk within 1km and all other raptor species within 2km of the study area was targeted using a pre-determined transect routes to incorporate all identified areas of potentially suitable breeding habitat. The transect routes were walked and driven on three occasions between April to July inclusive, with a series of five pre-determined vantage points located along the route, as illustrated in Appendix 6.3.	May-July 2020; March – July 2021

Survey Type	Survey Methodology	Timing
	Vantage point locations were selected to overlook large areas of potentially key breeding habitats. At each vantage point location along the transect route surveyors stopped for approximately 1/1.5 hours to record any observed raptor behaviour, with a particular focus on birds displaying or exhibiting other behaviour indicative of breeding.	
Nightjar and Owl Surveys	With reference to SNH guidance and standard methodology (Hardy *et al*. 2013 and Gilbert *et al* 1998), the study area and adjacent landscape, was visited on four occasions during June and July with surveyors walking along pre-determined transect routes designed to identify the presence or likely absence of breeding nightjar and owls up to 500m and 1km of the study area respectively. Due to the large size of the study area and distances between suitable habitat, two individual transect routes were created to adequately cover the north-western and south-eastern portion of the study area in a reasonable amount of time, as illustrated at Appendix 6.4. Surveyors began walking transect routes approximately 15 minutes after sunset and 2.5 hours before sunrise, with all positions of target species marked on digitally displayed OS maps using gps-enabled devices. In addition, the surveyors carried portable speakers and periodically played territorial calls of nightjars and owls to illicit a response from any birds present. Due to the timing of the transects from mid-June, many owl species are likely to be in the latter stages of breeding with adult birds likely to be in the process of brooding and feeding young. As such, with respect to owls, surveyors were primarily focused on identifying the calls of young birds to confirm presence as well as breeding within the survey area.	June-July 2020; March & June-July 2021
Vantage Point Surveys	A total of 72hrs of survey from three different vantage points (VPs) have been undertaken between April 2020 and March 2021 with reference to SNH guidance 2017. This has included 36hr from each VP over the course of the breeding season (April to July) and the other 36 hours spread across the migratory and winter periods. With reference to guidance, watches were no longer than 3hrs at one time, appropriate breaks taken between watches and timings spread over the course of the day. The VP and viewsheds (including parameters used to calculate these) are provided in Appendix 6.5.	April 2020 to March 2021; April 2021 to March 2022

Survey Type	Survey Methodology	Timing
Winter Transects	Moorland habitat across the study area has potential to support over wintering or passage short-eared owls and hen harriers. Six winter transect surveys have therefore been completed at monthly intervals during the winter months, as indicatively illustrated in Appendix 6.6.	October 2020 to March 2021; October 2021 to March 2022
Hen Harrier Roost Surveys	Owing to the occasional recording of an overwintering hen harrier around the study area, four targeted surveys were undertaken from two hen harrier VP shown in Appendix 6.7, supplemented with transects to and from the VPs timed at dusk or dawn. The surveys were undertaken with reference to best practice guidance (Hardy *et. al.* 2013) commencing one and a half hours before sunset and finishing half an hour after sunset or alternatively commencing prior to first light and continuing for an hour and a half after sunrise.	January to March 2021
Barn Owl Surveys	Records and locations of barn owl nest sites were obtained from the desk study for a 2km radius around the study area. All buildings within c.200m of the core study area and trees within 130m of each proposed turbine location were assessed for their barn owl potential, where access allowed, with any trees with major cavities also noted (see Appendix 5.11 and 5.12). In addition, local farmers were approached, where available, for any information they might have on the presence of barn owl across their land. VP survey timings were also mixed up during the survey season with some three-hour sessions timed to include crepuscular periods to record foraging onsite. Incidental sightings of this species would also have been recorded whilst completing nightjar/owl and bat surveys. Should barn owl activity be noted during other surveys that is indicative of breeding and/or greater access become available, then further investigation of potential barn owl nest and roost sites will be completed.	March and April 2021; Further survey subject to access and sightings.

Surveys and Species Scoped Out

6.5.11 In light of the desk study findings, habitats present and nature of the Development, certain bird surveys have been scoped out. Such surveys, and justification, for not scoping them out is summarised in Table 6.8.

Table 6-8: Summary of the ornithology surveys scoped out

Survey Type	Reason for Scoping Out
Common Breeding Bird Surveys	Common Breeding Bird surveys are not required by best practice to inform wind farm proposals, with the primary focus of ornithology surveys being on target species such as raptors, waders and waterfowl, rather than passerine species which are unlikely to be adversely affected by wind farm proposals. No such surveys are therefore proposed, though incidental recordings of passerine species of conservation concern are being made during other ornithology surveys.
Woodland and Waterbody Point Count Surveys	Woodland and waterbody point count surveys have been scoped out given the absence of waterbodies within the study area and lack of anticipated woodland impacts. It was considered that woodland target species, such as raptors, owls and nightjars, would be identified through specific survey methods covering these species, as outlined previously. In addition, VP surveys will capture any pertinent movements of target species across the site from or to such features in the wider landscape. No turbines are proposed in the woodland habitats.
Black Grouse Surveys	Absence of records from the local landscape and limited extents of suitable habitat.

6.5.12 It should also be noted, that while the VP surveys are being completed with reference to best practice guidance and meet the minimum 72hr from each VP per year requirement, 36hr is proposed over the breeding season with the remainder spread across the migratory and winter periods. Given the limited findings from the ongoing surveys, including winter transect surveys and hen harrier roost surveys, and collation of two years data, this survey effort is considered to be adequate for the purposes of the OIA.

6.5.13 It is proposed that raven and buzzards are scoped out of the OIA and collision risk analysis given their lack of conservation status and abundance across Gwent.

Limitations and Assumptions

6.5.14 To ensure transparency in the OIA, any assumptions or limitations in the collation of baseline information will be highlighted and a precautionary approach to the consideration of potentially significant effects and mitigation adopted. To date, the following limitations and assumptions have been identified:

- The desk-based assessment relies on available data, and best endeavours have been made to ensure that the data is accurate and up to date. It is assumed that information provided during the desk study is accurate;
- Access to certain parts of the study area or surrounding landscape has not been possible in all instances due to health and safety limitations or where access from private landowners cannot be gained. Where possible/necessary, ornithology observations were otherwise made from adjacent public rights of way or accessible land. Any such constraints will be highlighted, and a precautionary approach adopted with regards to the presence/valuation of species and potential for significant effects to arise;
- The topography and presence of large stands of coniferous woodland presented a challenge to ensuring total coverage of the Site and up to 500m from turbine locations, from the selected

VPs. However, the number and locations chosen are considered to provide sufficiently robust coverage to inform the OIA;

- Inclement weather meant that certain surveys had to be aborted. Where this occurred, surveys were rescheduled during better conditions to ensure the necessary survey effort was completed;
- As illustrated in Appendix 6.5, there are minor gaps in coverage or in areas at the limits of the viewshed of the observer. However, it is considered that adding additional VPs to cover these fringe areas, given the associated resource and health and safety implications, would not be proportionate to the minor survey data gains nor affect the outcome of the proposed mitigation; and
- Species are mobile and surveys therefore only provide a snapshot of the conditions present across the study area at the time of survey with a precautionary approach adopted based on habitat suitability and records of species locally.

Approach to Methodology

Evaluation Methodology

6.5.15 The evaluation of IOFs will be made with reference to the guidelines published by the CIEEM. The guidelines propose an approach to valuing ecological features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered. In addition, best practice guidance in relation to survey techniques and mitigation measures will also be taken into account.

Geographical Context

6.5.16 The Guidelines recommend that the value or potential value of the important ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used: International; National (Wales); Regional (South East Wales); County (Torfaen and Blaenau Gwent); and Local.

Valuing Designated Sites

6.5.17 Within the UK, certain valued habitats have been assigned a level of nature conservation value through designation; and the guidelines referred to above recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites (SACs, SPAs and RAMSAR sites);
- Nationally important sites (SSSIs, NNRs and LNRs); and
- Regional/County/District important sites (SINCs).

6.5.18 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Species

6.5.19 The guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, both species and habitats should be assessed according to their biodiversity value, measured against published selection criteria where available, such as those protected under the Conservation of Habitats and Species Regulations 2017 (as amended), or those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act 2016. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection, whilst using any relevant published evaluation criteria available at the time of assessment. Where habitats do not meet the necessary criteria for designation at a specific level, the guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Characterising Potential Impacts

6.5.20 The guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the Development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features as well as further consider impacts to the relevant ecosystem as a whole. The process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the ZoI during the lifetime of the Development.

6.5.21 When describing changes/activities and impacts on ecosystem structure and function, it is necessary to take into account the following parameters: positive or negative; extent; magnitude; duration; timing; frequency; and reversibility.

Significance Criteria

6.5.22 The guidance defines an ecologically significant impact as an 'effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general'. Once a potential significant impact is identified as likely to affect the integrity/favourable conservation status of a potential IOF, the value of the receptor will be used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.

6.5.23 Although certain species may not constitute IOFs based upon their nature conservation value they may still warrant consideration during the design and mitigation of the Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.

6.5.24 The guidance advocates the use of professional judgement, informed by relevant best practice guidance, in determining significant effects over the use of matrices.

6.5.25 The significance of the potential impacts upon IOFs will be assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the Development. Consideration will also be given to the potential future impacts to IOFs arising as a result of global trends and climate change.

6.5.26 Additionally, and in accordance with Conservation of Habitats and Species Regulations 2017 (as amended), screening will also be required to determine if likely significant effects upon pertinent designated sites comprising the National Site Network (i.e. SACs and SPAs) would arise as a result of the Development and, if this is the case, for an appropriate assessment (AA) to be undertaken. Whilst the Habitats Regulations Assessment is the responsibility of the Competent Authority, information to inform this process will be prepared.

6.6 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

6.6.1 Identifying potential effects on ecological receptors is an essential part of the EIA process allowing for the provision of appropriate mitigation measures and identification of residual impacts. Consideration will be given to the following potential effects upon IOFs:

- Construction:
  - Temporary and permanent habitat loss, including SINC designated land, due to the construction of turbine bases, access routes and required development of other structures/ancillary works;
  - Disturbance/displacement of fauna (visual, noise);
  - Sedimentation and pollution (dust generation, pollution of aquatic habitats);
  - Temporary lighting disturbance; and
  - Construction site hazards (increased vehicle movements).
- Operation:
  - Displacement of birds from usual foraging and migratory routes;
  - Disturbance of birds during maintenance works; and
  - Mortality of birds due to collision with turbines.
- Decommissioning:
  - As per construction phase.

6.7 CUMULATIVE & IN-COMBINATION EFFECTS

6.7.1 The OIA will give due consideration to potential in-combination or cumulative effects resulting from other development proposals within the ZoI. In respect of IOFs, consideration will be given to such developments within the same range of bird species recorded within the study area. In respect of developments to be included within the cumulative assessment, this will include: schemes which are operational or under construction; schemes which have been granted planning permission but are not yet constructed/operational; and proposals for which consent has been applied but which await determination (including those subject to determination at appeal). Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain, and/or in respect of potential development relating to pre-assessed areas defined within Future Wales: The National Plan 2040.

6.8 EFFECTS SCOPED OUT

6.8.1 As set out in Table 6.7, certain common breeding bird, woodland point count and black grouse bird surveys have been scoped out, in addition to a full 36hr of survey per VP during the migratory and winter periods.

6.8.2 Based upon the survey findings collated to date and best practice guidance, it is considered likely that passerines, such as skylark and meadow pipet, can be scoped out as IOFs within the OIA, though consideration will need to be given to their legal protection. Long-eared owl has also been scoped out on the assumption that there will be no notable loss of woodland habitat and that they also forage below the collision risk zone.

6.9 APPROACH TO MITIGATION

6.9.1 The mitigation hierarchy will be adopted, following the sequential process of avoidance, mitigation and compensation. Inherent in the design of the Development will be the avoidance of impacts upon IOFs as far as possible through the sensitive siting of turbine bases, access tracks and associated infrastructure. Where such impacts cannot be altogether avoided however, mitigation will be implemented to ensure such impacts are reduced as far as possible so as to minimise harm upon IOFs. Where mitigation is unavoidable, compensation will be necessary in respect of residual effects remaining after avoidance and mitigation measures have been taken into account. Additionally, enhancement measures will also be implemented so as to ensure overall net benefit to biodiversity are achieved.

6.9.2 Avoidance, mitigation, compensation and enhancement measures to be implemented as part of the Development will be informed by those ongoing ornithology field surveys, as detailed in Table 6.7, alongside further consideration of the Development as it evolves. Standard measures considered necessary to ensure compliance with relevant legislation, planning policy and best practice guidance will also be implemented, including: the preparation of a Construction Method Statement detailing the practical measures to avoid and reduce potential adverse effects arising; and the production of a habitat management plan detailing those management, maintenance and monitoring measures requiring delivery over the lifetime of the Development.

6.10 QUESTIONS FOR CONSULTEES

Question 6.1:	Are consultees satisfied that the study areas and VP coverage are appropriate?
Question 6.2:	Do consultees consider the scope of the ornithological baseline surveys and those methodologies employed to date sufficient and proportionate in respect of the Development?
Question 6.3:	Do consultees consider the scope of the further detailed surveys proposed sufficient and proportionate in respect of the Development?
Question 6.4:	Do consultees agree with the statutory and non-statutory sites to be scoped in/out of the assessment?
Question 6.5:	Do consultees agree with the IOFs to be scoped in/out of the assessment?

Question 6.6:	As a precaution, gull species and the Severn Estuary Ramsar and Flat Holm and Steep Holm SSSI have been scoped into the OIA. However, based on the ongoing findings, EDP considers that it is likely they can be scoped out. Do consultees agree?
Question 6.7:	Do consultees require the delivery of any specific bird mitigation?
Question 6.8:	Are there any other relevant consultees who should be consulted about this topic?

7 LANDSCAPE & VISUAL IMPACT

7.1 INTRODUCTION

7.1.1 This chapter considers the potential effects of the Development on landscape character and visual amenity. It includes a high-level baseline description, followed by the proposed assessment methodology to be used for the Landscape and Visual Impact Assessment (LVIA) to be completed as part of Mynydd Llanhilleth EIA.

7.1.2 The purpose of this scoping report is to identify the proposed assessment approach and agree the method of the assessment with consultees. The proposed approach to assessment described below sets out study areas at varying levels for landscape and visual receptors in accordance with best practice guidance. Consultees are invited to confirm the scope of this assessment and comment on whether they deem the scope proportionate.

7.1.3 A LVIA will be prepared to establish the landscape and visual effects of the Development upon the Site, and the two-tiered study area boundaries defined in this chapter. This will be carried out by Chartered Landscape Architects at The Environmental Dimension Partnership Ltd (EDP), a registered practice of the Landscape Institute. The methodology proposed is set out below which is based upon professional experience and best practice guidance produced by the Landscape Institute (LI)/Institute of Environmental Management and Assessment (IEMA) and contained within the 'Guidelines for Landscape and Visual Impact Assessment' (3rd Edition, 2013) (GLVIA3).

7.1.4 A Cumulative LVIA (CLVIA) will be included as part of the LVIA, and a Residential Visual Amenity Assessment (RVAA) will be undertaken to examine effects on the visual component of residential amenity for properties. A Night-Time Assessment will also be undertaken to assess the effects of pilot lights from a select few key locations.

7.1.5 The layout for the proposed turbines is not yet fixed. The initial baseline work and Zones of Theoretical Visibility (ZTVs) included in the supporting figures have indicatively mapped up to 12no. turbines with a blade tip height of up to 180m within the Scoping Site boundary. The final layout will be informed by the assessment of a wide range of factors, including potential landscape and visual effects and potential effects on residential visual amenity. The layout will be 'landscape led' to ensure the best possible 'landscape fit', but will also be informed by planning policy and relevant national and local guidance (and other technical factors). Assessment of the layout in conjunction with the other wind farms will be undertaken in light of the advice within 'SNH (March 2012), Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments'.

7.1.6 This chapter is supported by Figures 7.1-7.5 included at Appendix 7, and consultees questions are set out at the end of this chapter.

- Appendix 7.1: ZTV 45km extent (edp6367_d027a 18 May 2021 JTF/MD);
- Appendix 7.2: Topography Plan with LPA boundaries (edp6367_d031a 18 May 2021 CLM/MD);
- Appendix 7.3: ZTV with SLAs (edp6367_d034a 18 May 2021 CLM/MD);
- Appendix 7.4: Proposed Viewpoint Locations (edp6367_d035a 18 May 2021 CLM/MD); and
- Appendix 7.5: Environmental Planning Considerations (edp6367_d036a 18 May 2021 CLM/MD).

7.2 ENGAGEMENT & CONSULTATION

7.2.1 Engagement has been undertaken with the host Local Planning Authorities (LPAs) (TCBC and BCCBC) with further discussion planned post scoping direction, including consultation on the detailed approach to the assessment of effects on landscape character and visual amenity. The Brecon Beacons National Park Authority (BBNPA) are advised to be consulted as part of this scoping exercise; on the selection of viewpoints for the visual assessment, the night time assessment, and on information regarding developments to be included in the cumulative assessment. The methodology will be finalised following this consultation process.

7.2.2 Natural Resources Wales (NRW) was consulted via letter in February 2021. NRW returned a preliminary opinion in March 2021 (the Discretionary Advice Service was not available at the time of the request), advising that landscape assessments will be necessary, to be carried out in accordance with published best practice guidance, and for consultation to be undertaken with the Local Planning Authority.

7.3 BASELINE CONDITIONS

7.3.1 Initial studies have been undertaken to identify key landscape and visual receptors as well as proposed viewpoints to inform the assessment. These have been selected based on the initial Zone of Theoretical Visibility (ZTV) provided at Appendix 7.1 and knowledge of the local area.

7.3.2 The Site is split across two Local Planning Authorities; the majority of the Site lies to the east within the Torfaen Borough Council whilst part of the Site to the west lies within Blaenau Gwent County Borough Council as illustrated at Appendix 7.2. The Site occupies part of Mynydd Llanhilleth Common, public rights of way and minor roads cross parts of the Site such as Blaen-y-Cwm Road in the west of the Site which connects the small settlements of St. Illtyds to the north-west of the Site and Pantygasseg to the south of the Site. Another minor road runs roughly east-west through the northern part of the Site to connect St. Illtyds to Talywain and Abersychan. Refer to Chapter 3 of this report for further details on the description of Development.

7.3.3 The Site is set within the wider site context of the upper valleys of South Wales; the elevated and exposed plateau with a north-south orientation upon which the Site sits is framed by the Ebbw Valleys to the west, and Afon Lwyd Valley to the east. The arterial road network and merging settlements are largely confined within valley bottoms although some isolated dwellings and farmsteads are also scattered along valley sides.

7.3.4 To the west, the main settlements within the Ebbw Fach Valley and Afon Lwyd Valley are Abertillery to the north-west, and Abersychan to the north-east, respectively.

7.3.5 The landscape is large scale, rural and open and the general baseline context comprises settled and densely populated valleys, exposed plateaus and open undulating agricultural fields punctuated by patches of managed woodland with dramatic changes in landform.

7.3.6 The key baseline features of the Site include publicly accessible common land with minor roads and public rights of way, exposed uplands comprising grazed moors and a disused quarry enclosed by woodland.

7.3.7 The landform of the Site is defined by a plateau, which gives rise to localised ridgelines, hills and scarp slopes. The plateau has two distinct ridgelines that converge to form a fork formation on-site; these ridges loosely stem from the north-west of the Site and run east-west and east-south-west, respectively. The northern ridge of the fork steadily plateaus around c.450m above Ordnance Datum (AOD) just beyond the extents of the site boundary and the southern ridge gently falls to the south-east from c.430m in the west of the Site to c.400m towards the south-eastern edge. The highest elevations overall on Site are located on the northern boundary and rise to c.440m AOD whereas some of the lowest elevations are located on the scarp slopes; elevations of c. 240m AOD are found on the south-western boundary, and c.350m AOD on the south-eastern edge whereas the north-western edge of the Site which sits on the plateau is on average around c.420m AOD. Generally speaking, the hills and scarp slopes within the Site fall away to the south-west, south and south-east only.

7.3.8 As well as built form in the valley bottoms, other built form is perceived in the landscape such as renewable energy development to the west, which sets a precedent for wind energy in this general location.

Landscape Baseline (Receptors)

7.3.9 Initial studies have been undertaken to identify the landscape baseline of the Site and this is detailed below.

7.3.10 The Site is not within or adjacent to any national landscape designations such as a National Park or Area of Outstanding Natural Beauty (AONB). National landscape designations within the study area are shown in Appendix 7.1. The closest designated areas at national level are:

- Brecon Beacons National Park (BBNP), located nearly 5km to the north-east at its closest point; and
- The Wye Valley AONB, located over 20km to the east.

7.3.11 The internationally designated and culturally significant Blaenavon World Heritage Site (WHS) is located approximately 3.8km to the north-east of the Site at its closest point.

7.3.12 Appendix 7.3 illustrates that at the local level, the Site falls partially within two Special Landscape Areas (SLA):

- Eastern Ridge and Mynydd James SLA (Blaenau Gwent); and
- Western Uplands Special Landscape Area (Torfaen).

7.3.13 The Site is set within a landscape that contains a good network of Public Rights of Way (PRoW), including footpaths, cycle ways, bridleways, promoted routes and Open Access Land. There are a number of isolated farmsteads and private residences within the surrounding area, and the valley bottoms are densely populated.

7.3.14 LANDMAP is the national information system used to undertake an assessment of the landscape character as presented by the LANDMAP Geographical Information System. LANDMAP describes and evaluates the character of Wales using five aspect areas. In accordance with LANDMAP Guidance Note 46: Guidance for Wales, Using LANDMAP for Landscape and Visual Impact Assessment of Onshore Wind Turbines, all five aspect areas (Cultural Landscape Services, Geological Landscape, Historic Landscape, Landscape Habitats, and Visual and Sensory) will be

considered in the LVIA, with reference to published LANDMAP data. LANDMAP aspect areas within the Site boundary are likely to have direct effects and these are listed below in Table 7.1.

Table 7-1: LANDMAP Aspect Areas within the Site

Aspect Area	Aspect ID	Area Name	Overall Evaluation
Cultural	BLNGWCL228	Special Landscape Area	Outstanding
	TRFNCL972	Industrial - Rural	Moderate
	TRFNCL617	Uplands	High
Geological	BLNGWGL022	NULL	Moderate
	TRFNGL014	Cwm Du	High
	TRFNGL013	Plas y Coed	Moderate
	BLNGWGL023	NULL	Moderate
	TRFNGL003	Cwm y Glyn	High
Historic	BLNGWHL044	St Illtyd Fieldscape	Outstanding
	BLNGWHL025	Mynydd Coety	High
	TRFNHL029	Waun-wen and Mynydd Llanhilleth	High
	TRFNHL017	Waun-wen and Mynydd Llanhilleth: V	Outstanding
Landscape Habitats	BLNGWLH063	NULL	Moderate
	BLNGWLH062	NULL	Moderate
	BLNGWLH060	NULL	Low
	BLNGWLH059	NULL	Moderate
	BLNGWLH058	NULL	High
	TRFNLH042	NULL	Moderate
	TRFNLH036	NULL	High
	TRFNLH050	NULL	High
	TRFNLH015	NULL	Moderate
	TRFNLH010	NULL	Low
	TRFNLH017	NULL	Moderate
	TRFNLH044	NULL	Moderate
Visual and Sensory	BLNGWVS688	Mynydd Bedwellte	High
	BLNGWVS562	Cwm du	Moderate
	BLNGWVS226	St. Illtyd	High
	BLNGWVS985	Lower Ebbw Valley	High
	TRFNVS024	NULL	High
	TRFNVS036	NULL	Moderate
	TRFNVS020	NULL	Moderate
	TRFNVS022	NULL	Moderate
	TRFNVS019	NULL	High

7.3.15 Direct and indirect effects on landscape character will be assessed in the LVIA. The LANDMAP methodology proposed for assessing the wider landscape context summarised in Table 7.3.

Visual Baseline (Receptors)

7.3.16 There are a number of potential visual receptors within the study area which fall within the initial ZTV of 45km (using a tip height of 180m) provided at Appendix 7.1. It should be noted that the ZTV is based on bare earth modelling, therefore the screening effects of built form and vegetation are not taken into account. More detailed visual analysis, combined with extensive filtering using GIS, site

survey and use of Google Earth Pro helped refine the selection of representative viewpoints and the range of visual receptors that will need to be assessed.

7.3.17 The following receptors have been identified within the ZTV therefore these will be addressed within the LVIA, as shown on Appendix 7.5:

- Recreational users of the countryside such as users of Local PRoW and Cycle Routes;
- Promoted Routes such as Torfaen Trail and Rhymney Valley Ridge Walk;
- Minor roads accessing the wider countryside, settlements and villages;
- Areas of Open Access Land and Pen-y-Fan Country Park;
- Settlements which may experience visual change; and
- Tourism receptors, such as scenic viewpoints locations, visitors of BBNP and Blaenavon WHS.

7.3.18 Based upon ZTV and constraints mapping, longer distance views will also be included within the LVIA to provide a representation of visual effects from the Wye Valley AONB; however, significant effects are not anticipated for visual receptors from this distance. A range of views from various distances within BBNP have been proposed in the viewpoint selection also give a representative sample of the type and extent of views likely to be available. Similarly, two views are proposed from Blaenavon WHS, one from The Blorenge summit (also within BBNP) at a distance of nearly 10km from the Site and one from lower levels, just over 5km from the Site.

7.3.19 The visual component of residential amenity will also be assessed for all residential properties that are located within 2km and located such that a potentially significant or unacceptable effect might be anticipated. A further scoping exercise will be undertaken following the finalisation of the layout of the Development.

Viewpoint Selection

7.3.20 In order to demonstrate the visual change for the above identified receptors and to provide the basis for the wider assessment on visual amenity, a number of representative viewpoints will be used. These are described below and their locations are illustrated at Appendix 7.4. These viewpoints will be subject to review following the finalisation of the turbine layout. The number of viewpoints may increase or decrease following scoping and further stages of the EIA and LVIA process.

7.3.21 Initial baseline studies and ZTV mapping has been undertaken to identify key visual receptors to inform the assessment. As part of this process, a representative selection of viewpoints have been selected to cover a range of receptors, distances, and directions to inform the visual assessment.

7.3.22 The selection is based on the ZTV to tip height, a review of environmental planning considerations, and knowledge of the local area. Table 7.2 below sets the proposed viewpoints to be included within the LVIA along with the justification for the selection.

7.3.23 The purpose of the representative viewpoints is not to assess every potential effect, but to provide a representative sample of the most sensitive receptors in order to help ascertain the threshold for potentially significant effects on the wider scale.

7.3.24 Consultees are invited to confirm the viewpoint selection, including requests to scope out viewpoints or recommend additional / alternative locations.

Table 7-2: Proposed Viewpoint Locations

VP no.	Viewpoint name	Co-ordinates	Distance and direction from site	Principal receptors and reason for selection
Within 2km				
1	Public Footpath in Mynydd Llanhilleth Common	322919 , 202139	c. 320m north-west	Recreational users of PRoW and Common Land. Eastern Ridge & Mynydd James SLA.
2	Public Footpath to the east in western uplands SLA	325148 , 202741	c. 550m north-east	Recreational users of PRoW and Open Access Land. Western uplands SLA.
3	Blaen-y-cwm Road looking north	323998, 200272	c. 980m south	Minor Road users and representative residential receptor: The Old Black Barn Farmhouse.
4	Public Footpath in Pantygasseg	325376, 199908	c. 1km south-east	Recreational users of PRoW. Representative residential receptors: Pantegasseg.
5	Public footpath east of Abertillery	323114 , 204275	c. 1.7km north	Recreational users of PRoW.
6	Public footpath west of Six Bells	321532 , 203161	c. 2km north-west	Recreational users of PRoW. Mynydd Carn-y-Cefn SLA.
Within 2km-5km				
7	Llanerch Lane in Pen-tywn	320970, 200605	c. 2.3km south-west	Representative residential receptors: Pen-twyn.
8	Torfaen Trail east of Snatchwood	328056 , 202795	c.3.4km east	Recreational users of promoted route: Torfaen Trail. Representative residential receptors: Trevethin. Representative recreational receptor: Pontypool Golf Club.
9	Pen-y-Fan Country Park near Oakdale	319660 , 200948	c.3.5km west	Recreational users of Pen-y-Fan Country Park.
10	Brecon Beacons NP south west view	328866 , 204135	c.4.5km north-east	Recreational users of PRoW and BBNP.
11	Residential view from Croespenmaen	319455, 198688	c.4.2km south-west	Representative residential receptors: Croespenmaen.
Within 5km-10km				
12	Blaenavon World Heritage Site	327289 , 207771	c.5.7km north-east	Representative view from UNESCO World Heritage Site. Recreational users of PRoW. Eastern Uplands SLA.
13	Rocking Stone Scenic Viewpoint west of Cwm in Rhymney and Sirhowy Sides SLA	316025 , 204244	c.7.5km north-west	Recreational users of PRoW. Illustrative Tourist Scenic Viewpoint. Rhymney and Sirhowy Sides SLA.
14	Residential view from Pontllanfraith	316978, 196233	c.7.8km south-west	Representative residential receptors: Pontllanfraith and Blackwood.
15	Twmbarlwn summit (aka The Pimple)	324187 , 192603	c.8km south	Recreational uses of Open Access Land. Illustrative view from Scenic Tourist Viewpoint and Scheduled

VP no.	Viewpoint name	Co-ordinates	Distance and direction from site	Principal receptors and reason for selection
				Monument (Bailey and Castle).
16	The Blorenge, Brecon Beacons NP	327005 , 211871	c.9.5km north-east	Recreational users of BBNP. Blorenge Summit Trig Point 561m AOD.
Beyond 10km				
17	Rhymney Valley Ridge Walk	318599 , 190544	c.11km south-west	Recreational users of promoted route: Rhymney Valley Ridge Walk.
18	Cefn yr Ystrad, Brecon Beacons NP	308694 , 213749	c.18.7km north-west	Recreational users of BBNP. Illustrative view from Tourist Scenic Viewpoint and Scheduled Monument (Cairn) c.600m AOD.
19	Wye Valley AONB	346879 , 203691	c.22km east	Wye Valley AONB. View from Minor Road. Representative residential receptors: Llanishen

7.4 SCOPE OF THE ASSESSMENT

7.4.1 Potential landscape and visual effects arising from the Development which will be considered in the LVIA are those upon:

- Landscape features – direct landscape effects to features within the Site; landform and watercourses; trees and hedgerows;
- Landscape character – direct and indirect effects of both the site character itself and its wider context. Consideration made with regard to LANDMAP aspect areas, local landscape designations such as Special Landscape Areas, national and international landscape (or other relevant) designations, such as the Brecon Beacons National Park, and Blaenavon World Heritage Site and culturally important UNESCO sites; and
- People's views and visual amenity – visual receptors within publicly accessible locations e.g. PRoW, minor road routes, open access land and viewpoints upon hilltops of the BBNP (including The Blorenge and Cefn yr Ystrad).

7.4.2 In respect of the Brecon Beacons National Park, three viewpoints (viewpoints 10, 16 and 18 above) have been selected to represent a range of distances, directions and various location elevations from within the national landscape designation. The BBNPA are invited to respond on the viewpoint selection set out herein. In addition to the viewpoints proposed as part of the LVIA, it is anticipated that a night time assessment (if deemed necessary) will include a night time viewpoint from BBNP. BBNPA are invited to comment on the potential requirement for a night time assessment, and if deemed necessary, preferred viewpoint location/s to be included as part of this.

7.4.3 The assessment will be carried out through a three-stage approach, in accordance with the LI/IEMA guidelines:

- Firstly, the sensitivity of the identified receptors will be assessed through a baseline study of the Site and its context, and with reference to published guidance, fieldwork, documentary review and consultation;
- Secondly, the magnitude of change upon receptors likely to result from the addition of the Development will be assessed. The change predicted is based on the size and scale of the change, its duration and reversibility; and

- Thirdly through combination of the receptor sensitivity and predicted magnitude of change, the level, significance and nature of the identified landscape and visual effects will be assessed. Significance of landscape and visual effects vary with the location, landscape context and type of proposed development.

7.4.4 The scope of the component parts of the LVIA are set out below under each subset:

Landscape Character LANDMAP Assessment

7.4.5 LANDMAP Guidance Note 46 recommends that aspect areas for all five aspect layers should be included within the landscape assessment. The selection of which individual aspect areas to included will again be guided by LANDMAP Guidance Note 46 which advocates processes of 'filtering' the five different types of aspect area. This process has been interpreted and set out below to set out the intended approach to assessment.

Table 7-3: LANDMAP: Proposed Scope and Method of Assessment

Aspect Area	Filtering
Cultural* Geological Landscape Habitats	• Filter 1: Identify aspect areas that overlap fully, partially or are adjacent to the development site boundary; • Filter 2: Identify Geological Landscape aspect areas from filter 1 that record a special relationship with other aspect areas in the (LANDMAP survey question 2); • Filter 3: Refine aspect areas and retain those that are within the ZTV; and • Filter 4: Assess remaining Aspect Areas with High or Outstanding Value for Geological Landscape and Landscape Habitats. *Cultural Aspect Areas do not include landscape evaluation information; retain those identified from stages filter 1 and 3.
Historic Visual and Sensory	• Filter 1: An initial search area of 26km has been established based on LANDMAP ratio (1:133 for *high sensitivity receptors* x 180m tip height). • Filter 2: Refine to aspect areas within ZTV (tip height ZTV assumed); and • Filter 3: Identify and retain filtered aspect areas that are evaluated as outstanding or high within the initial search area. • Filter 4: Focus on remaining aspect areas within 15km of site as anything beyond this distance is unlikely to have significant effects.

7.4.6 For Visual and Sensory and Historic Landscape, the assessment will consider aspect areas within the ZTV with overall evaluations of high and above. Visual and Sensory aspect areas of 'moderate' overall evaluation will also be considered where scenic quality and/or character criteria are 'outstanding' or 'high' within 15km detailed study area. The LANDMAP assessment will be included as an appendix to the LVIA. The effects of the grid connection route will also be assessed as part of the LVIA also.

Visual Assessment

7.4.7 SNH guidance on the Visual Representation of Wind Farms (2017) states that an initial distance of 45km should be considered based on the maximum size of the turbines proposed (up to 180m to tip). This ZTV included at Appendix 7.1.

7.4.8 LANDMAP Guidance Note 46 suggests that for turbines of 176m-225m to tip, a typical 'extent of search' is 26km-33km, whilst a typical 'extent of study' for structures of 176m-225m is 26km-28km. Therefore the broad study area for the LVIA will be 26km from the Site boundary. Based on initial

research, a site visit, and reviews of previous applications, it is considered that the significant landscape effects would be unlikely beyond a distance of 15km extent from the Site. A detailed study area of 15km is therefore proposed. However, references and illustrations will be included for highly sensitive visual receptors within 15-26km where there an elevated level of sensitivity has been identified.

Residential Visual Amenity Assessment

7.4.9 A Residential Visual Amenity Assessment (RVAA) will also be undertaken to examine effects on the visual component of residential amenity for properties within 2km of the nearest proposed turbine. The proposed scope of assessment has been guided by advice in GLVIA 3 and the Landscape Institute's Residential Visual Amenity Assessment: Technical Guidance Note, 2019. Wireframes will be used to demonstrate the extent of visual effects from settlement groups and from individual dwellings, where appropriate.

Cumulative and In-Combination Effects

7.4.10 The Cumulative LVIA (CLVIA) will be undertaken in accordance with to Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments, Scottish Natural Heritage (March 2012). The CLVIA will assess the effects of the Development in combination with other wind farm sites for each of the following scenarios:

1. Those sites that are in planning or at appeal, which could include those at scoping stage if appropriate;
2. Consented schemes, including those under construction; and
3. Operational schemes.

7.4.11 SNH Guidance recommends that micro-generation turbines (25-50m) within 5km only should be included if they consist of three of more turbines. The scope of the CLVIA proposes to include single turbines of 45m+ to tip height where they are within 3km of the Site boundary to due to the potential visual relationship that could be formed.

7.4.12 The general CLVIA search area proposed is 26km in accordance with LANDMAP Guidance Note 46. It is also proposed that for single turbines, only those which are 50m high or taller beyond 5km are included in the LVIA.

7.4.13 The cumulative assessment will include potential sequential cumulative effects on routes, including roads and other routes, as well as cumulative effects on static receptors and viewpoints.

7.4.14 Chapter 2 includes operational and consented schemes to be included within the cumulative assessment which are known about at this stage. Guidance is sought from the consultees on the full scope of schemes to be included in the cumulative assessment, and in particular, what sites at planning stage should be included.

Technical & Illustrative Considerations

7.4.15 The technical productions provided in support of the LVIA for the Development will be in accordance with best practice guidance, and in particular The Landscape Institute's guidance documents identified subsequently. Provided below is a summary of the technical productions that will be produced to support the LVIA.

Zone of Theoretical Visibility (ZTV) Diagrams

7.4.16 Diagrams will be produced which illustrate the proposed 'bare ground' visibility of the wind farm within the defined study area; that is the visibility taking account of topography only and not considering vertical elements within the landscape such as trees, hedges, buildings or walls. ZTVs will be produced based upon the theoretical visibility of the 'blade tips' and also the 'hubs' (nacelles) of the proposed turbines so that the relative theoretical visibility can be properly understood for a viewer 1.6m in height.

7.4.17 The ZTVs will be overlaid with the various receptors (both landscape and visual) to inform and illustrate the assessment and to also provide clarity on where there will be no anticipated change.

7.4.18 To aid the cumulative assessment, cumulative blade tip ZTVs will be produced covering the range of 'certain' and 'uncertain' scenarios, such as the consented and operational schemes, and schemes in planning or at appeal. Where appropriate, consideration may also need to be given to other development proposals at the scoping stage where such details are in the public domain.

Wind Farm Visualisations

7.4.19 In addition to the ZTVs, computer generated images will be produced for each assessment viewpoint to illustrate how the Development may appear in the landscape from those views selected. For each viewpoint a panoramic photograph will be taken following LI guidance, and for each view a wireline will be provided showing a geometrically accurate representation of the Development superimposed onto a digital terrain model.

7.4.20 For some of the viewpoints a photomontage will also be produced by superimposing the (geometrically accurate) wireline image onto the panoramic photography, and then preparing a rendered composite image. The viewpoints selected as 'photomontage' viewpoints will be agreed with the host local authorities.

Proposed Study Area and Scope Summary

7.4.21 Based upon initial review of the Site and its context, relevant guidance and fieldwork, the study areas proposed for assessment within the EIA are as follows. This has followed an initial review of constraints and ZTV mapping at 45km extent to understand the extent and type of receptors likely to be affected, and with a view to ensuring the proportionality of the assessment and consideration of significant effects. Further reasoning for these study areas is provided below in Table 7.4:

Table 7-4: Proposed Study Area Summary

Element	Study area proposed
Cumulative LVIA – Consented and Operational sites as well as sites in planning. Includes single turbines of 45m+ to tip height where they are within 3km of the site boundary. Includes single turbines which are 50m high or taller beyond 5km.	26km
International / National Landscape Designations with very high sensitivity: Blaenavon WHS, BBNP, Wye Valley AONB and Promoted Routes. Visual receptors with very high sensitivity (publicly accessible locations from these designations)	26km
Visual Receptors - with high to low sensitivity: minor roads, PROW, country parks etc.	15km
LANDMAP Aspect Areas: Cultural, Landscape Habitats and Geological.	Within the site boundary
LANDMAP Aspect Areas: Visual and Sensory and Historic, within the ZTV with 'outstanding' or 'high' evaluations overall. Visual and Sensory aspect areas of 'moderate' overall evaluation will also be considered where scenic quality and/or character criteria are 'outstanding' or 'high'.	15km
Residential Visual Amenity Assessment	2km
Night-time Assessment	A few key viewpoints within c. 5km of the site to be agreed with consultees

7.5 ASSESSMENT METHODOLOGY

Relevant Law, Policy and Guidance

7.5.1 The assessment methodology for assessing landscape and visual effects prepared by EDP is based on the following best practice guidance:

- Guidelines for Landscape and Visual Impact Assessment – Third Edition (Landscape Institute and the Institute if Environmental Assessment, 2013);
- Using LANDMAP in Landscape and Visual Impact Assessments Guidance Note 46, Natural Resources Wales (2013);
- Designing Wind Farms in Wales, Design Commission for Wales (2014);
- Visual Representation of Wind Farms, Scottish Natural Heritage (Version 2.2) (2017);
- Guidance: Assessing the Cumulative Impact of Onshore Wind Energy Developments, Scottish Natural Heritage (March 2012);
- Siting and Designing Windfarms in the Landscape, Scottish Natural Heritage (Version 3), (2017);
- Visual representation of development proposals, Landscape Institute Technical Guidance Note 02/17 (31 March 2017);
- Residential Visual Amenity Assessment (RVAA)-Technical Guidance Note 2/19: Landscape Institute, (15 March 2019); and
- Planning Guidance for Wind Turbine Development Landscape and Visual Impact Assessment Requirements, Heads of the Valleys Landscape Officers and Planners with support from The South Wales Landscape Liaison Group (2015);

7.5.2 Other reference documents used to understand the baseline position in landscape terms comprise published landscape character assessments appropriate to the Site's location and the nature of the Development.

7.5.3 The nature of landscape and visual assessment requires both objective analysis and subjective professional judgement. Accordingly, the following assessment is based on the best practice guidance listed above, information and data analysis techniques. It uses quantifiable factors wherever possible and subjective professional judgement where necessary and is based on clearly defined terms.

Landscape Assessment

7.5.4 Landscape effects derive from changes in the physical landscape fabric that may give rise to changes in its character and how this is experienced. These effects need to be considered in line with changes already happening and occurring within the landscape and which help to define the character of it.

7.5.5 Effects upon the wider landscape resource i.e. the landscape surrounding the Development, requires an assessment of visibility of the Development from adjacent landscape character areas, but remains an assessment of landscape character and not visual amenity.

Visual Assessment

7.5.6 The assessment of effects on visual amenity draws on the predicted effects of the Development, the landscape and visual context, and the visibility and viewpoint analyses, and considers the significance of the overall effects of the Development on the visual amenity of the main visual receptor types in the study area.

Identifying Landscape and Visual Receptors

7.5.7 The assessment seeks to identify the key landscape and visual receptors that may be affected by the changes proposed.

7.5.8 The assessment of effects on landscape as a resource in its own right draws on the description of the Development, the landscape context and the visibility and viewpoint analysis to identify receptors, which, for the Development may include, but not be limited to, the following:

- The landscape fabric of the Site;
- The key landscape characteristics of the local context;
- The 'host' landscape character areas that contains the Development (LANDMAP Aspect Areas and SLAs);
- The 'non-host' landscape character areas surrounding the host character area and may be affected by the Development (where relevant); and
- Landscape designations on a national, regional or local level (such as SLAs).

7.5.9 The locations and types of visual receptors within the defined study areas are identified from Ordnance Survey maps and other published information (such as walking guides), from fieldwork observations and from local knowledge provided during the consultation process. Examples of visual receptors may include, but not be limited to, the following:

- Settlements and private residences;
- Recreational users of designated landscapes;

- Users of National Cycle Routes and National Trails;
- Users of local/regional cycle and walking routes;
- Those using local rights of way – walkers, horse riders, cyclists;
- Users of open spaces with public access;
- People using major (motorways, A and B) roads;
- People using minor roads; and
- People using railways.

Assessment of Landscape and Visual Effects

7.5.10 The assessment of effects on the landscape resource includes consideration of the potential changes to those key elements and components that contribute towards recognised landscape character or the quality of designated landscape areas; these features are termed landscape receptors. The assessment of visual amenity requires the identification of potential visual receptors that may be affected by the Development. As noted, following the identification of each of these various landscape and visual receptors, the effect of the Development on each of them is assessed through consideration of a combination of:

- Their overall sensitivity to the proposed form of Development, which includes the susceptibility of the receptor to the change proposed and the value attached to the receptor; and
- The overall magnitude of change that will occur - based on the size and scale of the change, its duration and reversibility.

Defining Receptor Sensitivity

7.5.11 A number of factors influence professional judgement when assessing the degree to which a particular landscape or visual receptor can accommodate change arising from a particular development. Sensitivity is made up of judgements about the 'value' attached to the receptor, which is determined at baseline stage, and the 'susceptibility' of the receptor, which is determined at the assessment stage when the nature of the Development, and therefore the susceptibility of the landscape and visual resource to change, is better understood.

7.5.12 Susceptibility indicates 'the ability of a defined landscape or visual receptor to accommodate the specific proposed development without undue negative consequences'[24]. Susceptibility of visual receptors is primarily a function of the expectations and occupation or activity of the receptor. A degree of professional judgement applies in arriving at the susceptibility for both landscape and visual receptors and this is clearly set out in the technical appendices to this assessment.

7.5.13 A location may have different levels of sensitivity according to the types of visual receptors at that location. Any one receptor type may be accorded different levels of sensitivity at different locations.

7.5.14 Table 7.5 provides an indication of the criteria by which the overall sensitivity of a landscape receptor is judged within this assessment and considers both value and susceptibility independently.

[24] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, Third Edition Page 158

Table 7-5: Landscape Receptor Sensitivity

Category	Landscape Receptor Value Criteria	Landscape Susceptibility to Change Criteria
Very High	Nationally/internationally designated/valued countryside and landscape features; strong/distinctive landscape characteristics; absence of landscape detractors.	Strong/distinctive landscape elements/ aesthetic/perceptual aspects; absence of landscape detractors; landscape receptors in excellent condition. Landscapes with clear and widely recognised cultural value. Landscapes with a high level of tranquillity.
High	Locally designated/valued countryside (e.g. Areas of High Landscape Value, Regional Scenic Areas) and landscape features; many distinctive landscape characteristics; very few landscape detractors.	Many distinctive landscape elements/ aesthetic/perceptual aspects; very few landscape detractors; landscape receptors in good condition. The landscape has a low capacity for change as a result of potential changes to defining character.
Medium	Undesignated countryside and landscape features; some distinctive landscape characteristics; few landscape detractors.	Some distinctive landscape elements/ aesthetic/perceptual aspects; few landscape detractors; landscape receptors in fair condition. Landscape is able to accommodate some change as a result.
Low	Undesignated countryside and landscape features; few distinctive landscape characteristics; presence of landscape detractors.	Few distinctive landscape elements/ aesthetic/perceptual aspects; presence of landscape detractors; landscape receptors in poor condition. Landscape is able to accommodate large amounts of change without changing these characteristics fundamentally.
Very Low	Undesignated countryside and landscape features; absence of distinctive landscape characteristics; despoiled/-degraded by the presence of many landscape detractors.	Absence of distinctive landscape elements/- aesthetic/perceptual aspects; presence of many landscape detractors; landscape receptors in very poor condition. As such landscape is able to accommodate considerable change.

7.5.15 For visual receptors, judgements of susceptibility and value are closely interlinked considerations. For example, the most valued views are those that people visit because of the available view – and it is at those viewpoints that their expectations will be highest and thus most susceptible to change. The overall sensitivity of visual receptors is rated in a two-step process that combines both susceptibility and value as indicated by the criteria in Table 7.6.

Table 7-6: Visual Receptor Sensitivity

Category	Visual Receptor Criteria
Very High	Designed view (which may be to or from a recognised heritage asset or other important viewpoint), or where views of the surroundings are an important contributor to the experience. Key promoted viewpoint e.g. interpretative signs. References in literature and art and/or guidebooks tourist maps. Protected view recognised in planning policy designation. Examples may include views from residential properties, especially from rooms normally occupied in waking or daylight hours; national public rights of way, e.g. National Trails and nationally designated countryside/landscape features with public access which people might visit purely to experience the view; and visitors to heritage assets of national importance.
High	View of clear value but may not be formally recognised, e.g. framed view of high scenic value, or destination hill summits. It may also be inferred that the view is likely to have value, e.g. to local residents. Examples may include views from recreational receptors where there is some appreciation of the landscape, e.g. golf and fishing; local public rights of way, access land and National Trust land, also panoramic viewpoints marked on maps; road routes promoted in tourist guides for their scenic value.
Medium	View is not promoted or recorded in any published sources and may be typical of the views experienced from a given receptor. Examples may include people engaged in outdoor sport other than appreciation of the landscape e.g. football and rugby or road users on minor routes passing through rural or scenic areas.
Low	View of clearly lesser value than similar views experienced from nearby visual receptors that may be more accessible. Examples may include road users on main road routes (motorways/A roads) and users of rail routes or people at their place of work (where the place of work may be in a sensitive location). Also views from commercial buildings where views of the surrounding landscape may have some limited importance.
Very Low	View affected by many landscape detractors and unlikely to be valued. Examples may include people at their place of work, indoor recreational or leisure facilities or other locations where views of the wider landscape have little or no importance.

7.5.16 The tables above offer a template for assessing overall sensitivity of any landscape or visual receptor as determined by combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape as set out at paragraph 5.39 of GLVIA 3rd Edition (2013). However, the narrative in this report may demonstrate that assessment of overall sensitivity can change on a case-by-case basis.

7.5.17 For example, a high susceptibility to change and a low value may result in a medium overall sensitivity, unless it can be demonstrated that the receptor is unusually susceptible or is in some particular way more valuable. A degree of professional judgement applies in arriving at the overall sensitivity for both landscape and visual receptors.

Magnitude of Change

7.5.18 The magnitude of any landscape or visual change is determined through a range of considerations particular to each receptor. The three attributes considered in defining the magnitude are:

- Scale of change;
- Geographical extent; and
- Duration and reversibility/proportion.

7.5.19 Receptor locations from which views of the Development are not likely to occur will receive no change and therefore no effect. With reference to the Zone of Theoretical Visibility (ZTV) and site survey, the magnitude of change is defined for receptor locations from where visibility of the Development is predicted to occur.

7.5.20 Table 7.7 provides an indication of the criteria by which the size/scale of change at a landscape or visual receptor is judged within this assessment.

Table 7-7: Landscape and Visual Receptor Magnitude of Change Criteria

Category	Landscape Receptor Criteria	Visual Receptor Criteria
Very High	Total loss of or major alteration to key elements/features/characteristics of the baseline condition. Addition of elements which strongly conflict with the key characteristics of the existing landscape.	There would be a substantial change to the baseline, with the proposed development creating a new focus and having a defining influence on the view.
High	Notable loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that are prominent and may conflict with the key characteristics of the existing landscape.	The proposed development will be clearly noticeable and the view would be fundamentally altered by its presence.
Medium	Partial loss or alteration to one or more key elements/features/characteristics of the baseline condition. Addition of elements that may be evident but do not necessarily conflict with the key characteristics of the existing landscape.	The proposed development will form a new and recognisable element within the view which is likely to be recognised by the receptor.
Low	Minor loss or alteration to one or more key elements/features/characteristics of the baseline landscape. Addition of elements that may not be uncharacteristic within the existing landscape.	The proposed development will form a minor constituent of the view being partially visible or at sufficient distance to be a small component.

Category	Landscape Receptor Criteria	Visual Receptor Criteria
Very Low	Barely discernible loss or alteration to key elements/features/characteristics of the baseline landscape. Addition of elements characteristic within the existing landscape.	The proposed development will form a barely noticeable component of the view, and the view whilst slightly altered would be similar to the baseline situation.

7.5.21 Table 7.8 provides an indication of the criteria by which the geographical extent of the area affected is adjudged within this assessment.

Table 7-8: Geographical Extent Criteria

	Landscape Receptors	Visual Receptor Criteria
Largest	Large scale effects influencing several landscape types or character areas.	Direct views at close range with changes over a wide horizontal and vertical extent.
	Effects at the scale of the landscape type or character areas within which the proposal lies.	Direct or oblique views at close range with changes over a notable horizontal and/or vertical extent.
	Effects within the immediate landscape setting of the site.	Direct or oblique views at medium range with a moderate horizontal and/or vertical extent of the view affected.
	Effects at the site level (within the development site itself).	Oblique views at medium or long range with a small horizontal/vertical extent of the view affected.
Smallest	Effects only experienced on parts of the site at a very localised level.	Long range views with a negligible part of the view affected.

7.5.22 The third, and final, factor, in determining the predicted magnitude of change is duration and reversibility. Duration and reversibility are separate but linked considerations. Duration is judged according to the defined terms set out below, whereas reversibility is a judgement about the prospects and practicality of the particular effect being reversed in, for example, a generation. The categories used in this assessment are set out below.

Duration:

- Long term (20 years+);
- Medium to long term (10 to 20 years);
- Medium term (5 to 10 years);
- Short term (1 year to 5 years); and
- Temporary (less than 12 months).

Reversibility:

- Permanent with unlikely restoration to original state, e.g. major road corridor, power station, urban extension etc.;

- Permanent with possible conversion to original state, e.g. agricultural buildings, retail units;
- Partially reversible to a different state, e.g. mineral workings;
- Reversible after decommissioning to a similar original state, e.g. wind energy development; and
- Quickly reversible, e.g. temporary structures.

Significance of Effect

7.5.23 The purpose of the EIA process is to identify the significant environmental effects (both beneficial and adverse) of development proposals. Schedule 4 to the EIA Regulations specifies the information to be included in all environmental statements, which should include a description of:

> *'The likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development.'*

7.5.24 In order to consider the likely significance of any effect, the sensitivity of each receptor is combined with the predicted magnitude of change to determine the significance of effect, with reference also made to the geographical extent, duration and reversibility of the effect within the assessment. Having taken such a wide range of factors into account when assessing sensitivity and magnitude at each receptor, the significance of effect can be derived by combining the sensitivity and magnitude in accordance with the matrix in Table 7.9.

7.5.25 The parameters identified for the evaluation of effects follows recommendations for the assessment of visual effects, in guidance published by Scottish Natural Heritage[25], which states that:

> *'The…matrix of three classes on each axis producing 9 cells, only 3 of which are typically judged as significant, is in our view simplistic and unrefined and quite unsuitable as a tool for widespread use. In particular it implies a degree of certainty about a very restricted definition of significance that we do not believe is justified. Expanding a 3 x 3 (9 cells) matrix to 4 x 4 (16 cells) or even 5 x 5 (25 cells) is much more representative of the diversity of size and sensitivity found in visual impact assessment.'*

[25] Scottish Natural Heritage (2002) *Visual Assessment of Windfarms Best Practice,* Scottish Natural Heritage Commissioned Report F01AA303A

Table 7-9: Level of Effects Matrix

Overall Sensitivity	**Overall Magnitude of Change**				
	Very High	High	Medium	Low	Very Low
Very High	**Substantial**	**Major**	**Major/-Moderate**	**Moderate**	Moderate/-Minor
High	**Major**	**Major/-Moderate**	**Moderate**	Moderate/-Minor	Minor
Medium	**Major/-Moderate**	**Moderate**	Moderate/-Minor	Minor	Minor/-Negligible
Low	**Moderate**	Moderate/-Minor	Minor	Minor/-Negligible	Negligible
Very Low	Moderate/-Minor	Minor	Minor/-Negligible	Negligible	Negligible/-None

7.5.26 Each effect is described and evaluated individually through the combination of all of the relevant factors and assessed as either significant or not significant. For landscape and visual effects, those effects identified at a substantial, major, major/moderate or moderate level (bold type within matrix above) are generally considered to be significant and those effects assessed at a moderate/minor, minor, minor/negligible or negligible level are considered to be not significant.

7.5.27 In certain cases, where additional factors may arise, a further degree of professional judgement may be applied when determining whether the overall change in the view will be significant or not and, where this occurs, this is explained in the assessment.

Definition of Effects

7.5.28 Taking into account the levels of effect described above, and with regard to effects being either adverse or beneficial, the table below represents a description of the range of effects likely at any one receptor.

Table 7-10: Definition of Effect

Effect	**Definition**
Substantial	Effects which are in complete variance to the baseline landscape resource or visual amenity.
Major	Effects which result in noticeable and fundamental alterations to the landscape resource or visual amenity.
Moderate	Effects which result in noticeable but non-fundamental alterations to the baseline landscape resource or visual amenity.
Minor	Effects which result in slight alterations to the landscape resource or visual amenity.

Effect	Definition
Negligible	Effects which result in barely perceptible alterations to the landscape resource or visual amenity.
None	No detectable alterations to the landscape resource or visual amenity.

7.5.29 Effects can be adverse (negative), beneficial (positive) or neutral. The landscape effects will be considered against the landscape baseline, which includes published landscape strategies or policies if they exist. Changes involving the addition of large scale man-made objects are typically considered to be adverse as they are not usually actively promoted as part of published landscape strategies. Accordingly, the assessment of landscape effects as a result of these aspects of the Development will be assumed to be adverse, unless otherwise stated within the assessment.

7.5.30 Visual effects are more subjective as people's perception of development varies through the spectrum of negative, neutral and positive attitudes. In the assessment of visual effects, the assessor will exercise objective professional judgement in assessing the level of effects and, unless otherwise stated, will assume that all effects are adverse, thus representing the worst-case scenario.

Cumulative Effects

7.5.31 Cumulative effects generally occur where there may be simultaneous or sequential visibility of two or more developments of the same type and scale, or where the consideration of other schemes would increase an effect identified. Where other similar schemes are in the planning system and made known to the applicant, or are under construction, these are considered in conjunction with the Development.

7.6 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

7.6.1 Taking account of the findings of the initial work undertaken to date, the potential visual and landscape effects that will be assessed in the EIA are described below.

Landscape Effects

7.6.2 The following list summarises the potential landscape effects:

- Direct effects on the landscape character of the site;
- Direct and indirect effects on the LANDMAP aspect areas listed in Table 7.1, as well as those in the wider area which a large proportion of the aspect area is located within the ZTV;
- Direct landscape effects on the Eastern Ridge and Mynydd James SLA and the Western Uplands SLAs ;
- Indirect effects on other SLA's in the detailed study area;
- Indirect landscape effects on Blaenavon World Heritage Site; and
- Indirect landscape effects on the special qualities of the Brecon Beacons National Park.

Visual Effects

7.6.3 The following list summarises the potential visual effects:

- Visual effects on local residents (principally including local farmsteads and residential properties within 2km, and larger settlements orientated towards the Site from within Ebbw Fach Valley and Afon Lwyd Valley);

- Visual effects from on users and visitors to Brecon Beacons National Park;
- Visual effect on visitors to Blaenavon World Heritage Site;
- Visual effects on road users (principally minor road users); and
- Visual effects on recreational receptors (e.g. country parks, public rights of way, promoted routes such as Torfaen Trail and Rhymney Valley Ridge Walk; users of National Cycle Routes, open access land).

7.7 CUMULATIVE, NIGHT-TIME & RESIDENTIAL VISUAL AMENITY EFFECTS

7.7.1 The effects on key residential receptors within 2km who are likely to be affected by the Development will be assessed thoroughly through a Residential Visual Amenity Assessment. Whilst still adopting a precautionary approach at this preliminary stage, the scope of the night time assessment and the cumulative LVIA will be informed by consultees.

7.8 EFFECTS SCOPED OUT

7.8.1 Subject to the agreement of the study areas for landscape and visual receptors as set out within this chapter, the following provides a consideration of those receptors to be scoped in and out of the assessment:

- All receptors within the LVIA study area of 26km that are outwith the blade tip ZTV would experience no change to the view and are scoped out.
- Only national landscape designations, and promoted routes within the broad study area of 26km should be scoped in.
- Local/regional landscape and visual receptors beyond the detailed study area of 15km from the Development , subject to viewpoint analysis should be scoped out.
- Effects on LANDMAP aspect areas outside of the study area as defined in LANDMAP Guidance Note 46 (NRW, 2013), where it is judged that potential significant effects are unlikely to occur, should be scoped out.
- Effects of decommissioning of the proposed wind farm at the end of its operational phase are scoped out.

7.8.2 Both the construction and operational phases are scoped in for reasons set out in Table 7.11 below.

Table 7-11: Construction Phase and Operational Phase

Impact	Scoped IN or OUT	Reason
Construction Phase		
Landscape and visual effects arising from the erection of the proposed turbines as well as the associated ancillary development, access tracks, alterations to existing public roads if required including vegetation removal, grid connection, etc. The	Scoped In	The temporary effect of a wind turbine development on the landscape and visual resource, arising from a changes to landscape characteristics and changes to views. The direct effects to the landscape resource as well as the indirect effects within the detailed study area. A number of landscape designations (SLAs, BBNP, Blaenavon WHS) are located in the environs of the

Impact	Scoped IN or OUT	Reason
construction phase will involve machinery such as cranes.		proposed wind farm and therefore there is the potential for temporary adverse impacts through change to landscape characteristics.
Operational Phase		
Change to the perception of landscape character and on views. Large structures such as wind turbines have the potential to adversely impact the landscape over a large distance, impacting landscape characteristics and visual amenity.	Scoped In	The effect of a wind turbine development on the landscape and visual resource, arising from a changes to landscape characteristics and changes to views. A number of landscape designations (SLAs, BBNP, Blaenavon WHS) are located in the environs of the proposed wind farm and therefore there is the potential for adverse impacts through change to landscape characteristics.

7.9 APPROACH TO MITIGATION

7.9.1 The scale of the Development, such as the number of turbines, the layout and design of the Development as a whole is not yet fixed. LVIA baseline work carried out will influence the evolution of the design. The primary form of mitigation for landscape and visual effects is through iterative design of the layout of the turbines and associated infrastructure, as seen from key viewpoints. Landscape and visual matters will be raised as the assessment progresses so that potential alterations to the siting and layout, number of turbines, internal roads and/or ancillary development for instance can be incorporated to reduce impacts where possible.

7.10 QUESTIONS FOR CONSULTEES

Question 7.1	Do consultees consider the scope and method of the assessment sufficient and proportionate?
Question 7.2	Do consultees consider the study area parameters summarised at Table 7.4 acceptable in respect of the Development, and are there any elements that could be refined further, in the consultees experience to reduce the scope suggested?
Question 7.3	Do consultees agree with the scope of the proposed viewpoint selection provided at Table 7.2?
Question 7.4	Wireframes are proposed from all viewpoints identified. Do consultees have specific viewpoints the request photomontages are prepared for?
Question 7.5	Do the consultees have a preference for which views should be included in the night time assessment?

Question 7.6	Do consultees feel that 2-3 viewpoints within 5km of the Site is proportionate for the night-time assessment?
Question 7.7	Can the consultees provide a list of proposals to be assessed as part of the Cumulative LVIA?
Question 7.8	Do consultees agree that the Cumulative LVIA should only assess consented and operational wind farm schemes as well as those in planning in accordance with SNH guidance?
Question 7.9	Do consultees agree that the 26km study area proposed for the Cumulative LVIA is sufficient and proportionate in respect of the Development?
Question 7.10	Are there any other relevant guidance documents not referenced (or any other issues for consideration) that the Consultees would recommend to inform this topic?
Question 7.11	Are there any other relevant consultees who should be consulted about this topic?
Question 7.12	Do consultees agree with the matters scoped out, as listed in section 7.8?

8 CULTURAL HERITAGE & ARCHAEOLOGY

8.1 INTRODUCTION

8.1.1 This chapter sets out the proposed approach to the assessment of effects of the Development on cultural heritage receptors (hereafter 'historic assets'), both during construction and operation.

8.1.2 This chapter has been prepared by The Environmental Dimension Partnership (EDP) Ltd.

8.2 RELEVANT LAW, POLICY & GUIDANCE

8.2.1 The assessment of effects of the Development will be carried out in accordance with the following legislation, policy and guidance.

Legislation

- Historic Environment (Wales) Act 2016;
- Ancient Monuments and Archaeological Areas Act 1979;
- Planning (Listed Buildings and Conservation Areas) Act 1990; and
- Hedgerow Regulations 1997.

National Planning Policy

- Future Wales: The National Plan 2040
- Planning Policy Wales (PPW) (11th edition; February 2021) - Policy concerning the treatment of the historic environment across Wales is detailed in Section 6.1 of Chapter 6 Distinctive and Natural Places; and
- Technical Advice Note (TAN) 24 (Welsh Government, 2017).

Guidance and Best-Practice Documents

- Conservation Principles for the sustainable management of the historic environment in Wales (Cadw, 2011);
- Setting of Historic Assets in Wales (Cadw, 2017);
- Heritage Impact Assessment in Wales (Cadw, 2017);
- Standard and guidance for historic environment desk-based assessment (Chartered Institute for Archaeologists, 2020);
- Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment (Chartered Institute for Archaeologists, 2020);
- Guide to good practice on using the Register of landscapes of historic interest in Wales in the planning and development process (ASIDOHL2; 2nd edition; Cadw 2007);
- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS, 2011); and
- Glamorgan Gwent Archaeological Trust (GGAT) standards and guidance for archaeological work.

8.3 ENGAGEMENT & CONSULTATION

8.3.1 The following stakeholders have been identified as consultees for cultural heritage aspects of the Development and will be approached for information to inform the EIA:

- Cadw;
- GGAT;
- Torfaen County Borough Council;
- Blaenau Gwent County Borough Council; and
- Local archaeological interest groups (as appropriate).

8.4 BASELINE CONDITIONS

8.4.1 The Site mainly comprises open mountain upland, with some enclosed fieldscapes around its margins.

8.4.2 The known baseline for heritage and archaeology within the Site is relatively sparse. There are no designated historic assets within the Site which would pose a constraint to development, and only a small number of designated assets within the Archaeology Study Area which extends 2km from the Site centre-point (see below). These designated assets are primarily of post-medieval and modern age and comprise the following:

- Cwmbyrgwm Colliery (scheduled monument MM163) and its grade II listed chimney Cadw Ref. 18591);
- Hafod-arthen a 16th-17th century pair of 'unit' farmhouses, with an additional 18th century cowshed; (Grade II; Cadw Ref. 1867); and
- Ty-llwyd, a17th century domestic structure, possibly with 16th century origins as a hall house (Grade II; Cadw Ref. 22672).

8.4.3 Also of note, immediately beyond the Archaeology Study Area to the west, is the medieval St Illtyd's Church (Grade II* listed; Cadw Ref. 1866), in proximity to the scheduled monument St Illtyd's Castle Mound (MM141).

8.4.4 In respect of non-designated historic assets, the GGAT Historic Environment Record (HER) contains records for a number of features within or intersecting the Site. These range in date from the Roman period (a possible but unproven road), to the medieval and pre-industrial post-medieval era (house platforms, boundary cross), through to the later post-medieval period. The records for the latter period comprise a mix of pastoral features and the relics of the substantial industrial activity that took place on Mynydd Llanhilleth. These workings for coal (and to a lesser extent for iron) were particularly prevalent around the interface between the enclosed fieldscape and the unenclosed upland common.

8.4.5 A substantial part of the Site fell within an extensive area of opencast mining during the 1960s and 1970s. Any archaeological features that once existed within the footprint of the opencast will have been destroyed. The surviving elements of the enclosed fieldscape include historic boundary features (field banks, hedges and drystone walls). These preserve the traditional framework of the landscape and fulfil the 1997 Hedgerow Regulations criteria for an 'important' boundary in historic terms, being part of a field system predating the Inclosure Act of 1845.

8.4.6 To the north of the Site is the Blaenavon Industrial Landscape World Heritage Site (WHS). The WHS lies 3.6km from the Site boundary at its nearest point, and parts of it fall within the Development's Zone of Theoretical Visibility (ZTV). The area around Blaenavon is considered one of the best examples in the world of a landscape created by coal mining and iron making from the late 18th and early 19th century and the WHS' Outstanding Universal Value (OUV) derives from two key aspects:

- Criterion (iii): The Blaenavon Landscape constitutes an exceptional illustration in material form of the social and economic structure of 19th century industry; and
- Criterion (iv): The components of the Blaenavon Industrial Landscape together make up an outstanding and remarkably complete example of a 19th century industrial landscape.

8.4.7 According to the UNESCO Description (https://whc.unesco.org/en/list/984/) there are 24 scheduled monuments and 82 listed buildings within the WHS property. There are also two conservation areas within the property: the Blaenavon Town Centre; and Cwmavon. There is no buffer zone defined around the WHS, nor any area outside of the WHS which is considered to provide its essential setting. (Note is made of the Forgotten Landscapes project, discussed in the Blaenavon WHS Management Plan 2011-2016: this proposed a buffer zone extended southwards and included the Site, but the buffer was not formally adopted).

8.4.8 Broadly coincident with the WHS is the Blaenavon historic landscape (HLW (Gt) 1). It was included on the Register of Outstanding Historic Landscapes in Wales (Cadw 1998) on the same basis as the WHS, namely:

> "*An area covered by early, coal opencasts which survives as probably the only sizeable, abandoned, multiple period, opencast mineral working in South Wales. It remains a palimpsest of early mineral working and processing, crisscrossed by shallow trench mines, tramway inclines and tips. These elements, with the town of Blaenavon, Coity Mountain, the Blorenge and Pwll Du, and a preserved mining scenery directly related to the mining processes, form the essence of the unique historic character of the landscape of Blaenavon*."

8.4.9 The boundary of this area, as given by the Register of Outstanding Historic Landscapes lies 3.5km to the north of the Site. However, detailed historic landscape characterisation subsequently defined a somewhat larger area which extended further to the south: the nearest historic landscape character area (HLCA) lies 2.4km to the north of the Site boundary. The Blaenavon historic landscape encompasses all of the WHS, as well as substantial additional areas, especially to the east and west.

8.4.10 The Development is not anticipated to have a significant physical effect on any historic assets, if at all. As discussed above, the greater part of the Site comprises reinstated opencast, within which no archaeological remains or upstanding heritage features will survive. Outside the footprint of the former opencast, known historic assets are sparse and should be avoidable by micro-siting of the turbines and associated infrastructure.

8.4.11 The principal issues for the Development are anticipated to stem from off-site effects, i.e. arising from changes to the setting of historic assets. The scope of the setting assessment has not yet been defined but, as discussed in the following section, the scoping exercise will consider all assets within a 10km radius of the Site. However, it seems likely that the primary focus will be on the designated assets within the immediate vicinity of the turbines and on the Blaenavon WHS and Blaenavon registered historic landscape.

8.5 ASSESSMENT METHODOLOGY

Study Area

8.5.1 There is no industry-wide accepted methodology for the assessment of effects upon cultural heritage and archaeology within EIA. As such, the study areas proposed are based upon recent practice within EIA for wind energy projects. The Development has the potential to cause direct physical effects to historic assets lying within the Site and may cause effects to assets lying in proximity to the Site due to the change in their setting that the presence of the Development would cause. Consequently, this assessment will adopt two study areas.

8.5.2 The first of these relates to baseline data for the Site and its immediate environs (termed the Archaeology Study Area). Its principal purposes are: to identify historic assets within the Site which are potentially at risk from physical damage; to understand their context; and to assess the potential for the Site to contain other remains which have not yet been identified. This study area will extend 2km from the Site's centre-point, which results in a minimum buffer around the site boundary of c. 350m, and generally rather greater. Given the upland context of the Site, this is deemed adequate to capture all known assets within the Site and its immediate vicinity, and to understand the archaeological potential. This study area is deliberately restricted to the upland zone of Mynydd Llanhilleth and does not extend to the settlements within the adjacent valley floors. This avoids the need to integrate the substantial number of non-designated built historic assets within these settlements into assessment baseline (particularly those included on the National Monuments Record of Wales (NMRW)).

8.5.3 A wider Setting Study Area will be adopted to enable the assessment of potential changes to the settings of historic assets, such that could affect their significance. This will not be rigidly defined, but in practice is expected to extend to a maximum of 10km from the Site – a distance which is considered adequate to capture all historic assets whose settings could be potentially altered by the Site's development.

8.5.4 The access route and grid connection will also be included within the assessment. The study areas for these elements will be based on a 10m buffer. This will be adequate to identify any historic assets within or near to the routes of these elements, on which there might be a physical impact. The effects of the access route and grid connection upon the setting of historic assets will also be considered, if appropriate, but given the character and scale of these elements, this assessment will take place only within a very limited envelope.

Data Sources

8.5.5 The following principal sources of information will inform the assessment:

- Cadw: data for designated historic assets – WHS, scheduled monuments; listed buildings; registered historic parks and gardens; registered historic landscapes; conservation areas;
- GGAT HER – information on known archaeological sites, monuments and finds, as well as previous archaeological investigations; detailed historic landscape characterisation for the Blaenavon historic landscape;
- Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW): NMRW; historic aerial photographs;
- Central Register of Aerial Photography for Wales (CRAPW): recent and historic air photographs;
- NRW: LIDAR datasets (Lle portal);

- The Historic Wales online portal;
- Conservation Area details from Torfaen and Blaenau Gwent County Borough Councils;
- Maps and plans held in the Glamorgan Archives (subject to any access restrictions posed by Covid-19);
- LANDMAP datasets; and
- Findings of other topics e.g. LVIA; geology/ground conditions; noise and vibration.

Field Surveys

8.5.6 The field survey will comprise a walkover survey of the Site, focused around infrastructure locations, and visits to those historic assets (both on- and off-site) identified as likely to experience effects related to setting change. Should any hitherto unidentified historic assets be identified during the course of the walkover survey, these will be integrated into the assessment and an appropriate record will be made of them (i.e. location, extent, form, date and significance).

8.5.7 Given the upland character of the Site, no geophysical survey, systematic field walking or evaluation trenching is proposed within the scope of this assessment.

Assessment of the Blaenavon Industrial Landscape World Heritage Site

8.5.8 In addition to other assessments, a stand-alone Heritage Impact Assessment (HIA) will be compiled. This will consider the potential impact of the Development on the Blaenavon Industrial Landscape WHS. The methodology will follow that set out by the ICOMOS Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (2011). The HIA's content will conform to that set out within Appendix 4 of the guidance document. Criteria for asset value, scale and severity of impacts, and for significance of the effect of change will be drawn from section 5 of the guidance.

Assessment of the Blaenavon Registered Historic Landscape

8.5.9 The ASIDOHL2 process will be employed to assess the potential impact on the Blaenavon historic landscape. No other registered historic landscape will be subject to assessment.

8.5.10 The assessment will follow the Guide to good practice on using the register of landscapes of historic interest in Wales in the planning and development process (2nd edition; Cadw 2007).

8.5.11 Stages 1, 3, 4 and 5 of the ASIDOHL2 process will be followed. Stage 2, which is concerned with physical impacts, is not required as the Site lies outside the boundaries of the historic landscape.

8.5.12 The ZTV for the Development indicates that the turbines will principally be visible from the southern and eastern, upland, character areas (HLCAs) of the historic landscape, which formed the 'resource zone' that supplied the core, productive area. These comprise HLCAs 11, 16, 17, 18, 19 and 20. The ZTV indicates limited visibility of the Development (if any) from the lower-lying core of Blaenavon: it is this latter area in which the majority of designated assets within the historic landscape (and WHS) are situated.

Setting Assessment Methodology

8.5.13 The assessment of potential effects on historic assets arising from changes to their setting will follow Cadw guidance given in Setting of Historic Assets in Wales (Cadw, 2017). This guidance sets out a four-stage approach to the identification and assessment of setting effects as follows:

- Stage 1: Identify the historic assets which might be affected;
- Stage 2: Define and analyse the setting, to understand how it contributes to the asset's heritage significance;
- Stage 3: Evaluate the potential impact of development; and
- Stage 4: Consider options to mitigate or improve that potential impact.

8.5.14 The scope of the setting assessment (Stage 1) will initially be informed by the ZTV and then refined through field inspections. This will establish which historic assets would experience a visual, or other type of, setting change and, conversely, which assets can be scoped out.

8.5.15 For those assets where a potential change to their setting may occur, further analysis will be undertaken to assess the level of impact (Stages 2 and 3). The ZTV mapping uses a bare earth model, but initial site visits indicate that it is broadly representative of the situation on the ground, due to the open character of the landscape. It is anticipated that formal viewpoint graphics (photomontage and wireframe images) will be generated from key historic assets and viewpoints, in order to provide a robust basis for the assessment.

Assessment Criteria

8.5.16 The assessment of impacts on historic assets will be undertaken in accordance with the methodology described in the Design Manual for Roads and Bridges (DMRB) (LA104: Environmental assessment and monitoring). This report provides a nationally agreed standard for the assessment of environmental impacts, including archaeology and heritage.

8.5.17 The 'value' of a structure, area, site or landscape reflects its significance as a historic asset and, therefore, its sensitivity to change.

8.5.18 The assessment of the value (or 'significance') of an historic asset includes a consideration of its archaeological, historic, architectural and artistic interests and the extent to which that significance relates to different elements of the asset and to what extent the setting of a historic asset adds to or detracts from its significance.

8.5.19 The assessment includes, where appropriate, assessment of any evidence for the potential reduction of value (or significance) due to former changes in condition, such as the truncation or the erosion of archaeological deposits, alterations to buildings, or severance or removal of historic landscape features etc.

8.5.20 LA104 (in Table 3.2N) sets out guidance on the criteria used for establishing the value of environmental assets. Table 8.1 relates these general criteria to historic assets.

Table 8-1: Environmental value (sensitivity) and descriptions.

Value (significance) of receptor /resource ***Typical description***	**Historic asset types**
Very High *Very high importance and rarity, international scale*	Assets inscribed as being of universal international importance, such as World Heritage Sites (including nominated sites). Assets of acknowledged international importance. Assets that contribute significantly to acknowledged international research objectives. Buildings of recognised international importance. Historic landscapes of international value, whether designated or not. Extremely well-preserved historic landscapes with exceptional coherence, time-depth or other critical factor(s).
High *High importance and rarity, national scale*	Scheduled Monuments with extant remains, or sites and remains of comparable quality. Assets that contribute significantly to acknowledged national research objectives. Grade I and Grade II* Listed Buildings. Other listed buildings that can be shown to have exceptional qualities in their fabric or historical association not adequately reflected in their listing grade, including non-designated structures of clear national importance. Conservation areas containing very important buildings. Designated and non-designated historic landscapes of outstanding interest of high quality and importance, and of demonstrable national value.
Medium *Medium or high importance and rarity, regional scale*	Designated or non-designated assets that contribute to regional research objectives. Grade II Listed Buildings. Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historic association. Conservation areas containing important buildings. Historic Townscape or built-up areas with historic integrity in their buildings, or built settings (e.g. including street furniture and other structures). Designated special historic landscapes and non-designated landscapes that would justify special historic landscape designation, landscapes of regional value.

Value (significance) of receptor /resource *Typical description*	Historic asset types
Low *Low or medium importance and rarity, local scale*	Sites of low importance. Assets compromised by poor preservation and/ or poor survival of contextual associations. Locally listed buildings. Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures). Non-designated historic landscapes. Historic landscapes with importance to local interest groups.
Negligible *Very low importance and rarity, local scale.*	Assets with very little or no surviving archaeological interest. Buildings of no architectural or historical note; buildings of an intrusive character. Landscapes with little or no significant historical interest.
Unknown	Assets the importance of which has not been ascertained.

8.5.21 Impacts may arise during construction or operation and can be temporary or permanent, and direct or indirect. Impacts can occur to the physical fabric of the asset or affect its setting. Impacts upon fabric would be adverse; those upon setting may be either beneficial or adverse.

8.5.22 LA104 (in Table 3.4N) gives the following table of factors to be used in the assessment of magnitude of impact (Table 8.2).

Table 8-2: Magnitude of impact and typical descriptions.

Magnitude of impact (change)		Typical description
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements.
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.

Magnitude of impact (change)		Typical description
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction.	

8.5.23 An assessment of the level of significant effect, having taken into consideration any embedded and additional mitigation, is determined by cross-referencing between the value/significance of the asset (Table 8.1) and the magnitude of impact (Table 8.2). The resultant level of effect set out in Table 8.3 can be adverse or beneficial. The matrix is a guide to decision-making only, allowing for the application of professional judgement. Where the Significance of Effects matrix presented in Table 8.3 allows for two levels of significance (e.g. Slight or Moderate, Large or Very Large) professional judgement will be used on a case-by-case basis to determine the appropriate level of significance.

Table 8-3: Significance Matrix.

	Magnitude of impact (degree of change)					
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Environmental value (sensitivity)	**Very high**	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Source: LA104 Table 3.8.1.

8.5.24 Table 8.4 sets out and describes the significance of effects and defines those which are considered material in the decision-making process.

Table 8-4: Significance categories and typical descriptions.

Significance category	Typical description
Very large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Source: LA104, Table 3.7

8.6 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

Direct and Indirect Physical Impacts

8.6.1 Direct physical impacts describe those development activities which directly cause damage to the fabric of an historic asset. Typically, these activities are related to construction works and will only occur within the site of the asset.

8.6.2 Indirect physical impacts describe secondary processes, triggered by the Development, which lead to the degradation of historic assets. For example, changes to hydrology may affect archaeological preservation; or changes to the environs of a building or area may affect the viability of its current use and thus lead to dereliction.

Impacts Arising from Changes to the Setting of Historic Assets

8.6.3 An impact on the setting of an historic asset occurs when the presence of a development changes its surroundings in such a way that it affects (positively or negatively) the heritage significance of that asset. Visual impacts are most common, but other environmental factors such as noise, light or air quality can be relevant in some cases.

8.6.4 Physical impacts are most likely to arise during the construction phase of the project. Setting impacts may be encountered at all stages in the life cycle of a development, from construction to decommissioning, but they are only likely to generate significant permanent effects during the operational phase.

8.7 CUMULATIVE & IN-COMBINATION EFFECTS

8.7.1 There is no industry-wide accepted methodology for the assessment of cumulative effects to cultural heritage and archaeology within EIA. The assessment of cumulative effects will review the agreed list of cumulative schemes for the Development (as set out in Chapter 2) and identify whether any further effects (i.e. effects that will not be caused solely by the Development itself) will arise. This assessment will be undertaken and articulated in the same terms as the assessment of the effect of the Development in its own right.

8.8 EFFECTS SCOPED OUT

8.8.1 On the basis of the work undertaken to date, the professional judgement of the assessment team and experience from other similar projects it is proposed that the following effects can be scoped out due to good design and implementation of standard good practice construction measures:

- Direct effects to assets beyond the development footprint;
- Decommissioning phase: this should not result in damage to historic assets as any ground disturbance would already have occurred during the construction phase; and
- Effects related to setting change for historic assets lying more than 10km from the Site.

8.9 APPROACH TO MITIGATION

8.9.1 Owing to the nature of the Development, it is unlikely that mitigation for visual change to the setting of historic assets can be formulated. It is therefore envisaged that mitigation will focus on addressing direct effects to historic assets. The approach to mitigation will be guided by industry common practice and appropriate procedures as laid out in the relevant standards and guidance documents from the Chartered Institute for Archaeologists. Preservation in situ will be the preferred option, with turbines and associated infrastructure being micro-sited so as to avoid known historic assets. Should preservation in situ not be viable, an appropriate programme of investigation and recording will be put in place, in agreement with statutory consultees.

8.10 QUESTIONS FOR CONSULTEES

Question 8.1:	Do consultees consider the study areas appropriate?
Question 8.2:	Are there any other relevant consultees who should be consulted about this topic?
Question 8.3:	Are consultees aware of any other supplementary guidance or further advice or evidence of relevance to the assessment of cultural heritage and archaeology effects?
Question 8.4:	Is the approach to the assessment of effects, including those effects scoped in and out and the cumulative assessment, appropriate?
Question 8.5:	Is the approach to field survey considered appropriate?
Question 8.6:	Do the consultees advise that HIA for the Blaenavon WHS is required, and is the proposed methodology considered appropriate?
Question 8.7:	Are consultees able to confirm that no buffer zone has been formally adopted for the Blaenavon WHS?
Question 8.8:	Are consultees able to recommend any HIA Reports for WHS in Wales, or for industrial WHS landscapes elsewhere, which would be an exemplar for the HIA for this Development?

9 HYDROLOGY

9.1 INTRODUCTION

9.1.1 This chapter describes the proposed scope of the assessment with respect to the Hydrology. The chapter should be read in conjunction with the description of the Study Area presented in Chapter 3 and with respect to relevant parts of other chapters (Chapter 5: Ecology and Biodiversity, and Chapter 10: Hydrogeology, geology, ground conditions), where common receptors have been assessed and where there is an overlap or relationship.

9.1.2 The scope of the assessment is based on a high-level review of baseline information and will be confirmed through review of additional data sources, a site visit and consultation with stakeholders including, but not limited to the following: Natural Resources Wales (NRW), Blaenau Gwent County Borough Council and Torfaen County Borough Council as the Lead Local Flood Authorities (LLFA) and the Local Planning Authorities (LPA).

9.2 RELEVANT LAW, POLICY & GUIDANCE

9.2.1 This Scoping Report chapter has been prepared in line with national and local policy, listed below.

National

- Water Framework Directive (2000/60/EC);
- Water Environment (Water Framework Directive) Regulations 2017;
- Water Framework Directive (Standards and Classifications) Directions 2015;
- Water Resources (Environmental Impact Assessment) Regulations (England and Wales) 2003 (as amended);
- Flood and Water Management Act 2010;
- The EU Floods Directive (2007/60/EC), as enacted into domestic law by the Flood Risk Regulations 2009;
- Land Drainage Act 1991;
- Future Wales: The National Plan 2040 (2015);
- Planning Policy Wales (Edition 11); and
- Technical Advice Note 15: Development and Flood Risk (2004).
- Water Act 2014;
- The Pollution Prevention and Control (England and Wales) Regulations 2000;
- The Water Supply (Water Quality) Regulations 2018;
- The Private Water Supplies (Wales) Regulations 2017;
- The Waste (England and Wales) (Amendment) Regulations 2012;
- Part IIa of the Environment Protection Act 1990;
- The Town and Country Planning (EIA) Regulations 2017; and
- Welsh Government, Statutory Standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems. 2018.

Regional

- Severn River Basin Management Plan (2015); and
- Severn Preliminary Flood Risk Assessment (2018).

Local

- Blaenau Gwent County Borough Council Local Flood Risk Management Strategy (2013); and
- Torfaen County Borough Council Local Flood Risk Management Strategy (2013).

9.2.2 The technical guidance documents that are relevant to the Hydrology assessment include:

- British Standards Institute BS6031: Code of Practice for Earthworks (2009);
- Construction Industry Research and Information Association (CIRIA) Report C532: Control of Water Pollution from Construction Sites (2001);
- CIRIA Report C692: Environmental Good Practice on Site (2010);

9.3 ENGAGEMENT & CONSULTATION

9.3.1 No formal consultation has been undertaken to date.

9.4 BASELINE CONDITIONS

Data Sources

9.4.1 The EIA scoping exercise has been undertaken with reference to Chapter 3: The Study Area, supported by a number of data sources. The principal data sources used to inform this chapter for potential effects are summarised in Table 9.1 below.

Table 9-1: Data Sources

Data	Source	Purpose
Natural Resources Wales Flood Risk Maps	**https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en** (accessed April 2021)	For assessment of fluvial flood risk
Natural Resources Risk of Flooding from Surface Water	**https://lle.gov.wales/catalogue/item/RiskOfFloodingFromSurfaceWater/?lang=en** (accessed April 2021)	For assessment of surface water flood risk
Natural Resources Wales – Water Framework Directive (WFD) Cycle 2 Rivers and waterbodies	**https://nrw.maps.arcgis.com/apps/webappviewer/index.html** (accessed April 2021)	For WFD assessment
Natural Resources Wales - Geo Portal for Wales (Lle) for Source protection zones	**http://lle.gov.wales/catalogue/item/SourceProtectionZonesSPZMerged/?lang=en** (accessed April 2021)	To characterise the underlying aquifers and hydrogeology
BGS Geoindex Onshore – Aquifer Designation	**http://mapapps2.bgs.ac.uk/geoindex/home.html** (accessed April 2021)	To characterise the underlying aquifers and hydrogeology
British Geological Survey (BGS) Geology of Britain Viewer for geological information	**http://www.bgs.ac.uk/data/mapViewers/home.html** (accessed April 2021)	To characterise the underlying geology
Cranfield University – LandIS soilscapes viewer	**http://www.landis.org.uk/soilscapes/**	To characterise the underlying soils

Data	Source	Purpose
	(accessed April 2021)	
Ordnance Survey (OS) Mapping	Ordnance Survey	To characterise the local region and identify springs, ponds and lakes
National Library of Scotland – historical map	**https://maps.nls.uk/geo/explore/#zoom=14&lat=51.72994&lon=-3.15008&layers=161&b=1** (accessed April 2021)	To characterise historic land-uses
Blaenau Gwent County Borough Council (2013) – Local Flood Risk Management Strategy	**http://democracy.blaenau-gwent.gov.uk/Data/Ordinary%20Meeting%20of%20the%20Council/201307111400/Agenda/att220.pdf** (accessed April 2021)	To characterise the local flood risk and management measures
Torfaen County Borough Council (2013) – Local Flood Risk Management Strategy	**https://www.torfaen.gov.uk/en/Related-Documents/Roads-Highways-and-Pavements/Drainage/TorfaenLocalFloodRiskManagementStrategy.pdf** (accessed April 2021)	To characterise the local flood risk and management measures

Current Baseline

Introduction

9.4.2 This section provides a high-level review of the current baseline environmental characteristics for the Study Area and surrounding area of interest, with particular reference to the water environment. The baseline conditions will be confirmed through review of additional data sources, site visit and further consultation with stakeholders during the next stages of the EIA.

9.4.3 The geographical extent of the area of interest extends 1.5km from the Study Area. This nominated area of interest has been assessed to be conservative and sufficient for the purposes of this baseline appraisal, based on hydrological knowledge of the area and professional experience. Key hydrological features within the area of interest are identified on Figure 9.1.

Land use and topography

9.4.4 The Study Area covers an area of approximately 371ha. The area is largely undeveloped, although has been subject to coal mining dating back to the mid-19th century and as recent as the 20th century as shown on historical mapping. Small areas of land have been built upon more recently including farms and access tracks, but the area is largely dominated by grassland and coniferous woodland. A disused former quarry (known as 'The Canyon') is situated in the southern portion of the Study Area. The closest residential developments are Abertyleri to the north-west, Llanhilleth to the west, Pontypool and Pontnewynydd to the east and Hafodrynys to the south. The A467 is located to the west of the Study Area, whist the A472 and A4043 are situated to the south and east of the site, respectively.

9.4.5 The Study Area is located on a broad ridge which runs roughly in a north-south direction and leads to Coity Mountain to the north at an elevation of 578m AOD, approximately 5km from the Study

Area. The Study Area itself sits roughly across the summit of the ridge, with elevations varying between 250m AOD in the south-west to 470m AOD in the north of the Study Area. The majority of the Study Area sits at elevations between 350m AOD and 450m AOD across the ridge summit, as such the low lying area associated with the Nant Ddu valley is excluded from the Study Area.

Hydrology

9.4.6 The Study Area sits on a watershed between the Afon Ebwy Fach/Afon Ebwy catchment to the west, and the Afon Lwyd catchment to the east, both of which are classified as main rivers by NRW.

9.4.7 The Afon Ebwy Fach is situated approximately 800m west of the Study Area, and flows south joining the Afon Ebwy at Aberbeeg. At its nearest point, the Afon Ebwy passes within 1km of the south-west limit of the Study Area, and continues flowing south. The Afon Lwyd is situated 2km east of the Study Area, and flows south through Pontypool.

9.4.8 The Study Area is intersected by the headwaters of several tributaries of the Afon Ebwy and Afon Lwyd which are classified as ordinary watercourses. The headwaters of the Nant Cwmmllwydrew, Nant Cyffin and Nant y Cnyw intersect the west and south-west boundary of the Study Area and drain south into the Afon Ebwy. The headwaters of the Nant Ffwydd-oer, Nant Caws and Nant Ddu intersect the south-east limits of the Study Area, and drain east into the Afon Lwyd catchment.

9.4.9 Within the wider area of interest, the Nant y Groes to the north-west drains west into the Afon Ebwy Fach, and the Cwmsychan Brook and Blaengaefog Brook to the north-east drain east into the Afon Lwyd. An unnamed tributary joins the Cwymsychan Brook at Abersychan. The Trosnant Brook intersects the southern part of the area of interest, flowing east into the Afon Lwyd.

9.4.10 The Study Area is located within the Severn River Basin District and South East Valleys sub basin, and within the catchments of three Water Framework Directive (WFD) surface water bodies: Afon Ebwy Fach (source to confluence with Afon Ebwy) to the west of the Study Area, Afon Ebwy (confluence with Afon Ebwy Fach to Maes-glas) to the south-west of the Study Area, and the Afon Lwyd (source to Monmouthshire and Brecon Canal) to the east of the Study Area. The Afon Ebwy and Afon Ebwy Fach WFD surface water bodies achieved an overall classification of 'Moderate' whilst the WFD surface water body Afon Lwyd achieved an overall classification of 'Poor' in the 2016 WFD classification (Cycle 2) (Table 9.2).

Table 9-2: Summary of the WFD surface water body and its associated status definitions within Study Area

	Afon Ebwy Fach (source to confluence with Afon Ebwy) Surface Water Body	Afon Ebwy (confluence of Afon Ebwy Fach to Maes-glas) Surface Water Body	Afon Lwyd (source to Mon and Brecon Canal) Surface Water Body
Type	River	River	River
Water body identifier	GB109056032880	GB109056026910	GB109056032912
Catchment	South East Valleys	South East Valleys	South East Valleys
HMWB	No	Yes	No
Overall status	Moderate	Moderate	Poor
Ecological status	Moderate	Moderate	Poor
Chemical status	Good	Fail	Good

Notes: HMWB- heavily modified water body

Source: https://nrw.maps.arcgis.com/apps/webappviewer/index.html?id=2176397a06d64731af8b21fd69a143f6 (accessed 15/04/21). Status definitions from 2016 WFD classification (Cycle 2).

9.4.11 The OS map shows several springs within the wider area of interest with two springs issuing within the Study Area (Figure 9.1). These are both located in the southern portion of the Study Area, in a region of former quarrying known as 'The Canyon'. The springs are located at an approximate elevation of 358m AOD. The western-most spring drains south-west to the Nant y Cnyw, whilst the eastern-most spring drains south-east to the Nant Ffrwd-oer.

9.4.12 There are numerous ponds/lakes of varying sizes within the wider area of interest (Figure 9.1), and four within the southern portion of the Study Area. The ponds/lakes within the Study Area are located at elevations approximately between 330m AOD and 405m AOD.

Geology and Soils

9.4.13 The BGS online geology mapping indicates that there are limited superficial deposits across the Study Area, primarily following the valley floors. The Afon Ebwy Fach, Afon Ebwy and Afon Lwyd flow over Quaternary deposits of alluvium (clay, silt, sand and gravel), head (clay, silt, sand and gravel), and till. The northern portion of the Study Area is underlain by till deposits that sit across the ridge at the headwaters of the Nant Ddu. In addition, a band of alluvium follows the Nant Ddu valley floor eastward towards the confluence with the Afon Lwyd.

9.4.14 The Study Area is underlain by the Carboniferous South Wales Upper Coal Measures Formation. This is described as grey (productive) coal-bearing mudstones/siltstones with seat-earths and minor grey, quartz-rich sandstones, coals, and ironstones. There are numerous coal seams within the sequence, most of which have been worked. The South Wales Upper Coal Measures Formation comprises the Grovesend Formation and Hughes Member (mostly sandstone with smaller areas of sandstone, mudstone, and siltstone), which underlay the majority of the Study Area. Across the wider area of interest, the Rhondda and Brithdir Members (Pennant Sandstones with thin mudstone/siltstone and seat-earth interbeds and mainly thin coals) underlay the Afon Ebwy Fach, Afon Ebwy and Afon Lwyd valleys.

9.4.15 The soils within the Study Area comprise of restored soils from quarry and opencast spoil (in the centre and south areas), very acid loamy upland soil with a wet peaty surface (along the ridge line extending north to Coity Mountain) and freely draining acid loamy soils over rock (situated within the outer edges of the Study Area typically at lower elevations). The wider area of interest to the west and east is predominantly underlain by freely draining acid loamy soils over rock. Chapter 10 provides more information on this topic.

Hydrogeology

9.4.16 The South Wales Upper Coal Measures and the alluvium deposits underlying the Study Area are classified by NRW as Secondary A Aquifers. Secondary A Aquifers are defined as *"permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*". These are generally aquifers formerly classified as minor aquifers. The till and head deposits are classified as Secondary Undifferentiated aquifers. These are assigned in: "*cases where it has not been possible to attribute either category Secondary A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type".*

9.4.17 The South Wales Upper Coal Measures underlying the Study Area is a designated WFD groundwater body (SE Valleys Carboniferous Coal Measures GB40902G201900) and achieved 'Good' quantitative status and 'Poor' chemical status in the 2016 WFD classification (Cycle 2).

9.4.18 The Study Area and the wider area of interest are not within a source protection zone (SPZ). The closest SPZ is located within 3km to the north-east of the Study Area. SPZs show the risk of contamination from any activities that might cause pollution to public drinking water supplies. Chapter 10 provides more information on this topic.

Flood risk

Terminology

9.4.19 In this report, the probability of a flood occurring is expressed in terms of Annual Exceedance Probability (AEP), which is the inverse of the annual maximum return period. For example, the 100-year flood can be expressed as the 1% AEP flood, i.e. a flood that has a 1% chance of being exceeded in any year.

9.4.20 Table 9.3 is provided to clarify the use of the AEP terminology as well a description of the Flood Zone definitions as used by the NRW, and the Welsh Flood Zones set out in the Welsh Assembly Government's Technical Advice Note 15 (TAN15 (2004)) Development Advice Map (DAM) and associated guidance. Consultation on an updated version of TAN15 has recently been completed (January 2020). The draft update includes a range of changes to the guidance, in particular it removes reference to the Development Advice Map (DAM) and refers to a "Wales Flood Map" held by NRW. However, the consultation draft clearly states that TAN15 (2004) remains current until such a time that the replacement is confirmed. TAN15 (2004) has therefore been used to underpin this assessment.

Table 9-3: Flood Zone definitions and associated annual exceedance probability

WAG TAN15 DAM Flood Zone	NRW Flood Zones	Probability of flooding	AEP	Definition
Flood Zone A	Flood Zone 1	Low Probability	<0.1% AEP of river or sea flooding	Land with less than 1 in 1,000 probability of flooding from rivers or the sea, in any given year
Flood Zone C1 (developed and served by significant flood defences) / Flood Zone C2 (no significant flood defences)	Flood Zone 2	Medium Probability	1% - 0.1% AEP of river flooding 0.5% – 0.1% AEP of sea flooding	Land with between a 1 in 100 and 1 in 1,000 of river flooding; or land having between a 1 in 200 and 1 in 1,000 probability of sea flooding
Flood Zone B	N/A	N/A	N/A	Geological indicators of flooding
N/A	Flood Zone 3	High Probability	>1% AEP of river flooding >0.5% AEP of sea flooding	Land having a 1 in 100 or greater probability of river flooding in any year; or Land having a 1 in 200 probability or greater of sea flooding in any year.

Historical Flooding

9.4.21 NRW's online mapping of local historical flood extents does not show historical flooding records at or close to the Study Area.

Fluvial and Tidal Flood Risk

9.4.22 The NRW mapping for flood risk from rivers and the sea (Figure 9.2) shows that the Study Area lies entirely in Flood Zone 1. In the wider area of interest, there are areas of both Flood Zones 2 and 3, associated with the Afon Ebwy Fach and Afon Ebwy to the west of the Study Area, and associated with the Nant Ffwryd-oer, Nant Ddu and Afon Lwyd to the east.

9.4.23 NRW Development Advice Map shows that the Study Area is located in Flood Zone A (Figure 9.3). In the wider area of interest, the Afon Ebwy Fach, Afon Ebwy and Afon Lwyd are located in areas of Flood Zones B, C1 and C. Together, Development Advice Map zones C1 and C2 match with the overall extent of NRW Flood Zone 2. This risk of flooding from fluvial sources is therefore assessed to be low.

9.4.24 There is no risk of flooding from tidal sources given the elevation of the Study Area above 250m AOD.

Surface Water Flood Risk

9.4.25 Surface water flooding occurs when the intensity of rainfall is greater than the local drainage and infiltration capacity, causing water to flow overland. Where low-points or barriers to flow are present, particularly deep areas of surface water flooding may occur as a result of ponding. These areas are not limited to river corridors or floodplains.

9.4.26 NRW's mapping for surface water flood risk (Figure 9.4) shows that the majority of the Study Area and the wider area of interest is at very low risk of flooding (<0.1% AEP) from this source. This is reflective of the general topography of the Site, with the Study Area situated primarily across the ridge summit.

9.4.27 Narrow regions of Low to High (0.1% to >3.3% AEP) flood risk are anticipated along the minor tributaries surrounding the Study Area. Several wider regions of High risk (>3.3% AEP) are shown in the southern portion of the Site, consistent with the topographic depressions associated with historic quarrying activities in the area known as 'The Canyon'. The mapping also shows a band of surface water flooding near the eastern edge of the Study Area that is situated within a depression in the topography that is likely a relic of former quarrying activities.

9.4.28 The overall risk of surface water flooding to the Study Area is therefore assessed to be low.

Groundwater Flood Risk

9.4.29 Groundwater flooding occurs as a result of water issuing to the surface from the underlying aquifers. This tends to occur after long periods of sustained high rainfall, with areas most at risk typically situated on permeable geology and low-lying compared to the local water table, and where no watercourse is available to drain the water away.

9.4.30 Blaenau Gwent County Borough Council Local Flood Risk Management Strategy (2013) and the Torfaen County Borough Council Flood Risk Management Plan (2015) both state that there are no reports of historical groundwater flooding within the two boroughs.

9.4.31 The Study Area has no superficial cover. Local BGS boreholes show that the underlying bedrock (Hughes Member) consists of a cyclical sequence of sandstone, mudstone, siltstone and coal seam layers. The Hughes Member is classified as a Secondary A aquifer. Although groundwater emergence may be possible, any flows are expected to be limited/small as the Study Area is on a topographic high and the underlying geology comprises bands of both higher and lower permeability

bedrock layers. The elevated topography is likely to channel surface water to the valley floors relatively quickly, limiting the amount of percolation and increasing the amount of surface runoff. This is consistent with the EA Areas Susceptible to Groundwater Flooding Map, which is available for the western portion of the Study Area, and shows that the risk of groundwater flooding is less than 25%. Within the wider area of interest, there are areas of elevated risk (50% - 75%) typically consistent with the Afon Ebwy catchment valley floor.

9.4.32 This suggests that although some groundwater may be encountered during excavations in the Study Area, groundwater is unlikely to be found in significant quantities, and has not been assessed to be a significant potential flood risk.

Sewer Flood Risk

9.4.33 Sewer flooding occurs when the local capacity of the underground drainage network is exceeded resulting in the surcharging of water to the surface. The discharge of the drainage network into watercourses can also be affected by overall system capacity (i.e. where pumped), or high-water levels in the receiving waters obstructing the drainage of network outfalls.

9.4.34 It is anticipated that there are no/few sewer drainage networks within the Study Area. In the wider area of interest sewer drainage networks are likely to serve the towns/villages of Llanhilleth, Abertyleri, and Pontypool. However, these areas are at significantly lower elevation than the Study Area, and sewers are unlikely to constitute a source of flooding to the Study Area. The risk of sewer flooding in the Study Area is anticipated to be negligible.

Artificial Flood Risk

9.4.35 The NRW Reservoir Flood Risk Map shows that the Study Area is not at risk of flooding in the extreme (unlikely) event of a reservoir failure. In the wider area of interest, flooding from artificial sources is predicted along the Afon Ebwy Fach, and Afon Ebwy valleys to the west, and along the Afon Lwyd to the east. This is associated with potential failure/breach of reservoirs upstream of the Study Area with flood water flowing south along the valleys.

Conservation Sites

9.4.36 A number of designated sites for biodiversity conservation have been identified within or close to the Study Area in Chapter 5: Ecology and Biodiversity. There are no statutory designated sites for biodiversity within the Study Area. The closest statutory designated site is Ty'r Hen Forwyn SSSI situated approximately 0.7km south of the southern boundary of the Study Area. Ty'r Hen Forwyn SSSI is a species rich neutral grassland, The Site may have a small proportion of water dependent components (bogs, marshes, water fringed vegetation, fens), although is unlikely to be affected by the Development given that there are no direct hydrological links to the site, sitting within a separate sub-catchment of the wider Afon Ebwy.

9.4.37 Other statutory designated sites outside the Study Area (Aberbargoed Grasslands Special Area of Conservation (SAC), Cwm Clydach Woodlands SAC and Usk Bat Sites SAC) are also unlikely to be affected by the Development. Aberbargoed Grasslands SAC may have a small proportion of water dependant components (bogs, marshes, water fringed vegetation, fens) but is over 6km from the Study Area whilst Clydach Woodlands SAC and Usk Bat Sites SAC are not designated for water related interest.

9.4.38 The non-statutory designated sites (Sites of Importance for Nature Conservation (SINC)) within 2km of the Study Area which have a water component, and therefore can potentially be impacted by the

Development, are shown in Figure 9.5 and described in Table 9.4. One of the non-statutory designated sites (Tirpentwys Cut SINC) is located within the Study Area. These sites have been identified via open-source data, where available, and information provided by the local councils. However, it is noted that this list of sites is preliminary and subject to change with receipt of additional data. Additional information on the conservation sites will be collected through consultation with stakeholders during the next stages of the EIA in order to confirm the sites which are assessed to be water-dependant and therefore likely to be affected by the Development.

Table 9-4: Sites of Importance for Nature Conservation (SINC) with a water component within the area of interest

Site	Ecological interest	OS Grid Reference	Distance (km) from Study Area
Non- Statutory Sites			
Tirpentwys Cut SINC	Mosaic habitats, bog habitats and flushes, Standing open water, rock exposures	SO2348701383	Within Study Area
Cwm Farm Pond SINC	Pond	ST2289099535	1.2 S
Swyffryd Ganol Pond SINC	Pond	ST2232799387	1.2 S
Afon Ebwy Fach SINC	Significant linear wildlife corridor.	SO2207303065	1.1 W
Afon Ebwy SINC	Significant linear wildlife corridor	SO2096901803	1.0 SW

Future Baseline

9.4.39 Hydrological and hydrogeological baseline conditions may change even if the Development is not built out, for the following reasons:

- Climate change will result in increased rainfall seasonality, with generally wetter winters and drier summers; high-intensity rainfall events will become more common. This will lead to greater variation in river flows (low flows and high flows), and increases in flood risk;
- The location and rate of surface water and groundwater abstractions in the area could vary over time and may result in changes to the WFD surface water and groundwater body status and SPZ designations;
- Improvements to WFD waterbody status associated with improvements to individual quality elements (i.e. phosphate reduction) would result in higher-quality, more sensitive waterbodies; and
- Other new development (e.g. urbanisation settlements) along the valley bottoms may result in changes in hydrological baseline such as surface water runoff (flow and pathways) and increase

the number of development receptors.

9.5 ASSESSMENT METHODOLOGY

General Approach

9.5.1 This section describes the approach for the assessment of the effects of the Development on the hydrology receptors. The proposed approach will be confirmed with the NRW, LLFA and LPA during the next stages of the EIA.

9.5.2 The significance of an effect resulting from the Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of the hydrology, the key determinants of magnitude relate to surface water quantity (level and flow), and water quality. However, depending on the effects of surface water flows, there may also be indirect effects on downstream morphology and sediment dynamics, river water quality and flood risk. The method and criteria used to determine value, magnitude, and significance of effect are described in the sections below.

Determination of Significance

9.5.3 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the development".*

9.5.4 The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

9.5.5 Table 9.5 details the basis for assessing receptor sensitivity. The value of water features is normally related to the importance of the surface water or groundwater feature that might be at risk from effects. The criteria used by Wood in the assessment of water feature value are semi-quantitative, so some professional judgement by the assessor has been required.

Table 9-5: Establishing the sensitivity of water receptors

Sensitivity	Criteria	Receptor type*	Examples
High	Features with a high yield, quality or rarity with little potential for substitution.	Aquatic environment	Conditions supporting a site with an international conservation designation (Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site), where the designation is based specifically on aquatic features. WFD surface water body (or part thereof) with overall High status, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body.

Sensitivity	Criteria	Receptor type*	Examples
			WFD surface water body (or part thereof) with High status for morphology.
	Water use supporting human health and economic activity at a regional scale.	Water use	Regionally important public surface water or groundwater supply (and associated catchment/GWMU) or permitted discharge.
	Features with a high vulnerability to flooding.	Flood risk	Land use type defined as 'Emergency Services' in the TAN15 development categories (e.g. hospitals, ambulance/police stations that are required to operate during flooding and buildings used to provide emergency shelter in time of flood) and essential infrastructure equivalent (i.e. critical national infrastructure, such as essential transport and utility infrastructure)
Medium	Features with a medium yield, quality or rarity, with a limited potential for substitution.	Aquatic environment	Conditions supporting a site with a national conservation designation (e.g. SSSI, National Nature Reserve (NNR)), where the designation is based specifically on aquatic features. WFD surface water body (or part thereof) with overall 'Good' status/potential, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body. WFD groundwater body (or part thereof) with overall 'Good' status.
	Medium quality watercourse morphology	Watercourse morphology	A watercourse in natural equilibrium and exhibiting a natural range of fluvial processes and morphological features, with little or no modification or anthropogenic influence.
	Water use supporting human health and economic activity at a local scale.	Water use	Local public surface water and groundwater supply (and associated catchment/GWMU) or permitted discharge. Licensed non-public surface water and groundwater supply abstraction (and associated groundwater catchment) which is relatively large relative to available resource, or where raw water quality is a critical issue, e.g. industrial process water, or permitted discharge.
	Features with a medium vulnerability to flooding.	Flood risk	Land use type defined as 'Highly vulnerable development' in the TAN15 development categories (e.g. educational institutions, most types of residential development and vulnerable industrial development)
Low	Features with a low yield, quality or rarity, with some potential for substitution.	Aquatic environment	Conditions supporting a site with a local conservation designation (e.g. Local Nature Reserve (LNR), County Wildlife Site (CWS)), where the designation is based specifically on aquatic features, or an undesignated but highly/moderately water-dependent

Sensitivity	Criteria	Receptor type*	Examples
			ecosystem, including a Local Wildlife Site (LWS) and a GWDTE. WFD surface water body (or part thereof) with overall Moderate or lower status/potential, also any associated upstream non-reportable WFD surface water body or non-WFD surface water body. Groundwater body (or part thereof) with overall Poor status.
	Low quality watercourse morphology	Watercourse morphology	A watercourse showing signs of modification and recovery to a natural equilibrium, and currently exhibiting a limited range of fluvial processes and morphological features affected by modification or anthropogenic influence.
	Water use supporting human health and economic activity at household/individual business scale.	Water use	Licensed non-public surface water and groundwater supply abstraction (and associated catchment/GWMU), which is relatively small relative to available resource, or where raw water quality is not critical, e.g. cooling water, spray irrigation, mineral washing or permitted discharge. Unlicensed potable surface water and groundwater abstraction (and associated catchment) e.g. private domestic water supply, well, spring or permitted discharge.
	Features with a low vulnerability to flooding.	Flood risk	Land use type defined as 'Less vulnerable development' in the TAN15 development categories excluding water compatible development equivalent (e.g. general industrial, employment, commercial and retail development, transport and utilities infrastructure, mineral extraction sites (except sand and gravel)).
Negligible	Commonplace features with very low yield or quality with good potential for substitution.	Aquatic environment	Conditions supporting an undesignated and low water-dependent ecosystem, including a LWS, GWDTE and pond. Non-reportable WFD surface water body (or part thereof), or non-WFD surface water body, not associated with any downstream WFD surface water body. Non-reportable WFD groundwater body (or part thereof), or non-WFD groundwater body.
	Very low quality watercourse morphology	Watercourse morphology	A highly-modified watercourse changed by channel modification or other anthropogenic pressures, currently exhibiting no active flow processes or morphological diversity.
	Water use does not support human health, and of only limited economic benefit.	Water use	Unlicensed non-potable surface water and groundwater abstraction (and associated catchment) e.g. livestock supply.

Sensitivity	Criteria	Receptor type*	Examples
	Features that are resilient to flooding.	Flood risk	Land use type defined as 'Less vulnerable development' in the TAN15 development categories which is water compatible development equivalent (e.g. amenity open space, nature conservation and biodiversity, sand and gravel workings, docks, marinas, flood control infrastructure, water transmission infrastructure) and undeveloped land.

*Receptor types map onto receptor lists as follows:

- Aquatic environment –watercourses/WFD surface water bodies, aquifers/WFD groundwater bodies, conditions supporting GWDTEs and designated conservation sites
- Water use – springs, abstractions
- Flood risk – humans, properties and infrastructure.
- Watercourse morphology - watercourses.

9.5.6 Table 9.6 details the basis for assessing magnitude of change. The magnitude of change on water receptors is independent of the value of the receptor, and its assessment is semi-quantitative, based professional judgement.

Table 9-6: Establishing the magnitude of change

Magnitude	Criteria	Receptor type*	Example**, ***
Major	Effects will be of a consistently high magnitude and frequency and cause severe damage to key characteristics, features and elements or even total loss; or Major improvement to characteristics, features and elements of receptor.	Aquatic environment	Deterioration in river flow regime, morphology or water quality, leading to sustained, permanent or long-term breach of relevant conservation objectives (COs) or non-temporary downgrading (deterioration) of status of WFD surface water body (including downgrading of individual WFD elements) or dependent receptors, or resulting in the inability of the surface water body to attain Good status in line with the measures identified in the RBMP. Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of status of WFD groundwater body or dependent receptors, or the inability of the groundwater body to attain Good status in line with the measures identified in the RBMP.
		Watercourse morphology	Loss or extensive damage to geomorphological habitat and processes due to extensive modification and/or fine sediment input. Replacement of a large extent of the natural bed and/or banks with artificial material. Extensive change to channel planform.
		Water use	Complete or severely reduced water availability and/or quality, compromising the ability of water users to abstract.
		Flood risk	Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.

Magnitude	Criteria	Receptor type*	Example**, ***
Moderate	Adverse loss of resource or damage to characteristics, features or elements but limited impact on integrity; or Benefit or addition to characteristics, features and elements that improve the receptor.	Aquatic environment	Deterioration in river flow regime, morphology or water quality, leading to periodic, short-term and reversible breaches of relevant COs, or potential temporary downgrading of status of surface water body status (including potential temporary downgrading of individual WFD elements) or dependent receptors, although not affecting the ability of the surface water body to achieve future WFD objectives. Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of status of WFD groundwater body or dependent receptors, although not affecting the ability of the groundwater body to achieve future WFD objectives.
		Watercourse morphology	Partial loss or damage to geomorphological habitat and processes due to modifications and/or fine sediment input. Replacement of the natural bed and/or banks with artificial material (total length is more than 3% of water body length).
		Water use	Moderate reduction in water availability and/or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used.
		Flood risk	Change in flood risk resulting in potential for moderate damage to the property or infrastructure.
Minor	Some measurable changes that are noteworthy and material. Minor benefit or minor loss/detrimental change to the receptors characteristics, features or elements.	Aquatic environment	Slight change in river flow regime, morphology or water quality, but remaining generally within COs, and with no short-term or permanent change to status of WFD surface water body (of overall status or element status) or dependent receptors. Slight deterioration in groundwater levels, flows or water quality, but with no short-term or permanent downgrading of status of WFD groundwater body or dependent receptors.
		Watercourse morphology	Slight change or deviation from baseline conditions, or partial loss or damage or improvement/ gain to in channel habitat and geomorphological processes due to modifications and/or fine sediment input.
		Water use	Minor reduction in water availability and/or quality, but unlikely to affect the ability of a water user to abstract.
		Flood risk	Change in flood risk resulting in potential for minor damage to property or infrastructure.

Magnitude	Criteria	Receptor type*	Example**, ***
Negligible	Very minor changes that are not noteworthy or material.	Aquatic environment	No or very slight change in river flow regime or surface water quality, and no consequences in terms of COs or status of WFD surface water body or dependent receptors. No or very slight change in groundwater levels or groundwater quality, and no consequences in terms of status of WFD groundwater body or dependent receptors.
		Watercourse morphology	Very slight change from surface water baseline conditions, approximating to a 'no change' situation.
		Water use	No, or very slight change in water availability or quality and no change in ability of the water user to exercise licenced rights or continue with small private abstraction.
		Flood risk	Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure.

*The watercourse morphology receptor type is only relevant when 'in-channel' works are proposed.

**For the purposes of this assessment of change, relevant WFD elements for surface water body classification include:

- all biological quality elements e.g. fish, macrophytes, invertebrates;
- all physico-chemical quality elements e.g. dissolved oxygen, phosphate;
- hydromorphological supporting elements;
- Specific Pollutants; and,
- for Artificial and Heavily Modified Water Bodies,
- the mitigation measures assessment.

Significance Evaluation Methodology

9.5.7 The significance of water-related effects is derived by assessing both the value of the feature and the magnitude of change. Table 9.7 below indicates the level of the effect ranging from negligible to substantial. For the purposes of the ES, effects of moderate and higher are assessed to be significant effects.

Table 9-7: Framework for identifying environmental effects

Receptor sensitivity	Magnitude of impact			
	Negligible	**Minor**	**Moderate**	**Major**
Negligible	Neutral	Neutral	Minor/neutral	Minor
Low	Neutral	Minor	Moderate	Moderate/Major
Medium	Neutral	Moderate	Moderate/Major	Major
High	Neutral	Moderate/Major	Major	Substantial

9.5.8 In this assessment, only the potential and residual significance of change with respect to the water environment (groundwater levels, flows and quality, and river flows, quality and morphology) and

flood risk are assessed. It is important to recognise that a 'Significant' change in the water environment does not necessarily result in a 'Significant' change to ecological features. Indeed, because of the different benchmarks and magnitude criteria used by the two assessments, it is possible that a 'Not Significant' change in the water environment can still sit alongside a 'Significant' change in an associated ecological water feature, and vice-versa.

Assumptions

9.5.9 The scope of the assessment is based on a high-level review of desk-based baseline information and will be confirmed through review of additional data sources, site visit and further consultation with stakeholders (NRW, LLFA, LPA) during the next stages of the EIA. A site visit will be conducted to confirm the desk reviews of the hydrological baseline environment and review if the local mapped surface water features are hydrologically active.

9.6 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

Potential Receptors

9.6.1 The water environment receptors identified during this high-level assessment which could potentially be affected by the Development comprise:

- Nant Cwmllwydrew (ordinary watercourse), flowing to the west 200m to the west of the Study Area;
- Nant Cyffin (ordinary watercourse), flowing to the south-west 300m to the south-west of the Study Area;
- Nant y Cnyw (ordinary watercourse), flowing to the south-west 130m to the south-west of the Study Area;
- Nant Ffwydd-oer (ordinary watercourse), flowing to the south-east and intersecting the southern boundary of the Study Area;
- Nant y Caws (ordinary watercourse), flowing to the south-east and intersecting the south-east boundary of the Study Area;
- Nant Ddu (ordinary watercourse), flowing to the east 120m to the east of the Study Area;
- Afon Ebwy Fach (Main River and WFD surface water waterbody) which flows south 800m to the west of the Study Area, and joins the Afon Ebwy;
- Afon Ebwy (Main River and WFD surface water waterbody) which flows south 1km to the west of the Study Area;
- Afon Lwyd (Main River and WFD surface water waterbody) which flows south 2km to the east of the Study Area;
- Pond/lakes within the Study Area and wider area of interest (4 within the Study Area and 17 within the wider area of interest);
- Springs within the Study Area and wider area of interest;
- Licensed and private surface water abstractions within the area of interest (if present);
- Biodiversity sites within the Study Area and wider area of interest that are water-dependent (4 non-statutory designated sites (SINCs), no statutory designated sites); and
- Humans/properties/infrastructure downslope and adjacent to the Study Area including properties at Llanhilleth (west), Abertyleri (north-west), Hafodyrynys (south) and Pontypool (east).

9.6.2 With receipt of further baseline information, there may be a number of other receptors identified in the ES that require assessment, including surface water or groundwater abstractions within the area of interest.

Likely Significant Effects

9.6.3 The likely significant water environment effects for the construction, operational and decommissioning phases of the Development that will be taken forward for assessment in the Environmental Statement are summarised in Table 9.8. The effects for the decommissioning phase are expected to be similar in nature to the construction phase. As far as is practicable the Development infrastructure will be removed. Decommissioning effects will typically be temporary, short term effects that will occur during the break-up and removal of infrastructure.

Table 9-8: Likely significant water environment effects

Activity	Effect	Receptor
Construction and Decommissioning Phase		
Land preparation (earthworks, excavation)	Release of pollutants (e.g. chemicals, hydrocarbons and other construction materials) directly (e.g. accidental spillages into the ground/surface water) or indirectly (via surface water runoff) leading to deterioration in the surface water and groundwater quality environment, deterioration in the status of WFD surface water and groundwater bodies and deterioration in conditions supporting local conservation sites	Watercourses (Nant Cwmllwydrew, Nant Cyffin, Nant y Cnwy, Nant Ffrwd-oer, Nant Caws, Nant Ddu, and the WFD surface water bodies Afon Ebwy Fach, Afon Ebwy and Afod Lwyd) and minor tributaries Ponds/lakes within area of interest Springs within area of interest Groundwater in Hughes Member (WFD groundwater body and Secondary A Aquifer) Local surface water and groundwater abstractions (if present) Local non-statutory biodiversity sites that are water-dependent
Land preparation (earthworks, excavation)	Temporary increase in sediment-loading of surface water runoff from construction/dismantling areas leading to deterioration in the surface water quality environment and deterioration in the status of WFD surface water bodies	Watercourses (Nant Cwmllwydrew, Nant Cyffin, Nant y Cnwy, Nant Ffrwd-oer, Nant Caws, Nant Ddu, and the WFD surface water bodies Afon Ebwy Fach, Afon Ebwy and Afod Lwyd) and minor tributaries Ponds/lakes within area of interest Local surface water abstractions (if present)
Impermeable land associated with access tracks and construction/dismantling areas	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow impacting channel morphology	Flood risk receptors: humans/properties/ infrastructure downslope and adjacent to the Study Area including properties at Llanhilleth (west), Abertyleri (north-west), and Pontypool (east). Watercourses (Nant Cwmllwydrew, Nant Cyffin, Nant y Cnwy, Nant Ffrwd-oer, Nant Caws, Nant Ddu, and the WFD surface water bodies Afon Ebwy Fach, Afon Ebwy and Afod Lwyd) and minor tributaries

Activity	Effect	Receptor
Development of temporary infrastructure (e.g. site compound) near watercourses and potential temporary watercourse crossings (to be confirmed within final designs)	Temporary changes to watercourse flow conveyance leading to deterioration in the status of WFD surface water bodies	Watercourses (Nant Cwmllwydrew, Nant Cyffin, Nant y Cnwy, Nant Ffrwd-oer, Nant Caws, Nant Ddu, and the WFD surface water bodies Afon Ebwy Fach, Afon Ebwy and Afod Lwyd) and minor tributaries Local surface water abstractions (if present) Local conservation sites that are water-dependent
Operational Phase		
Impermeable land take (solid concrete foundations for turbines, substation and access tracks)	Increase in surface water runoff and therefore increase in flood risk downstream and, increase in potential erosional power of surface overland flow impacting channel morphology	Flood risk receptors: humans/properties/ infrastructure downslope and adjacent to the Study Area including properties at Llanhilleth (west), Abertyleri (west), and Pontypool (east). Watercourses (Nant Cwmllwydrew, Nant Cyffin, Nant y Cnwy, Nant Ffrwd-oer, Nant Caws, Nant Ddu, and the WFD surface water bodies Afon Ebwy Fach, Afon Ebwy and Afod Lwyd) and minor tributaries

9.6.4 A Flood Consequence Assessment (FCA) will be produced in accordance with the TAN15 as the Study Area exceeds 1ha and is within Flood Zone 1. The FCA will be produced to accompany the full EIA report and will demonstrate how flooding to the Development and any potential to increase flooding to third parties due to the Development, will be managed over its lifetime. As part of this, the effects of climate change will be given due assessment. The FCA will include an outline surface water drainage strategy, which will ensure that surface water runoff from the Study Area is managed and attenuated on site, so that the risk of flooding is not increased off-site. The most suitable surface water drainage strategy for the Study Area will be ascertained by undertaking a high-level SuDS Assessment considering the SuDS hierarchy.

9.7 EFFECTS SCOPED OUT

9.7.1 The impact of Priority Substances and Priority Hazardous Substances have been scoped out of further assessment given the nature of the Development. Appropriate land quality assessments on the former quarry site and any landfilling will be used to confirm.

9.8 CUMULATIVE & IN-COMBINATION EFFECTS

Cumulative Effects

9.8.1 This section assesses the potential for inter-project cumulative effects of the Development on the hydrological environment in conjunction with other plans, projects and activities.

9.8.2 A review of wind farm developments within approximately 20km of the Study Area is provided in Chapter 2: Environmental Impact Assessment, Table 2.5. Not all of these projects sit within the wider Afon Ebwy or Afon Lwyd catchments. As the cumulative baseline is constantly evolving, the schedule of cumulative schemes to be included in the assessment will be finalised following consultation with relevant consultees.

9.8.3 No other wind farm developments identified at this stage sit within 1.5km of the Study Area. The 1.5km buffer area has been assessed to be appropriate considering the nature of the Study Area and likely zone of influence on hydrological receptors. In the wider area of interest, the closest development is the Coed y Gilfach Wind Farm approximately 1.8km from the Site. It is assumed that the mitigation and monitoring strategies employed by other development within the area of interest will continue to ensure that there are no significant cumulative changes in surface water quantity and quality for the potential hydrology receptors identified in this chapter.

9.8.4 Consequently, it has been determined that no significant cumulative effects on hydrology and flood risk receptors are likely.

In-Combination Effects

9.8.5 In-combination effects consider the potential for interaction between different environmental topics within the same proposal, as a result of the developments direct effects. These are considered to be:

- Contamination of surface water impacting upon groundwater quality.
- Contamination of surface water impacting upon aquatic ecology.

9.8.6 The incorporation of appropriate and agreed upon mitigation measures discussed in the section below will reduce the risk of contamination of surface water. Therefore, the significance of the effects on surface water contamination impacting upon groundwater quality and aquatic ecology has been assessed to be low.

9.9 APPROACH TO MITIGATION

9.9.1 Potential impacts to the water environment arising from the Development will be avoided as much as possible through the design process and through careful construction and the use of standard good practice measures. The assessment will therefore be undertaken on the basis that a number of standard measures are assumed to be in place during construction and therefore are considered to be ‘embedded mitigation’. These measures include the use of appropriate drainage design, the use of runoff and sediment control measures where necessary and through the implementation of good working practice and adherence to a Construction Environmental Management Plan (CEMP), an outline of which will be provided in the ES.

9.9.2 The CEMP will include as a minimum:

- Adoption of best practice pollution prevention, drainage control, and waste management procedures;
- Control of drainage and sediment runoff from excavation areas and any access tracks;
- Agreement on watercourse crossing schedule (method and type of structure);
- Control of drainage and sediment runoff during the construction of watercourse crossings (where applicable);
- Control of concrete pouring; and
- Appropriate design of foundation installation, the management of soil water levels and the potential to generate excessive quantities of groundwater contaminated sediments.

9.9.3 An outline drainage strategy will be produced as part of the FCA to accompany the ES. The outline drainage strategy is anticipated to be the subject of a planning condition and will be prepared by the contractor before being agreed with NRW and the LLFA. The strategy will incorporate the use of

appropriate SuDS techniques as required, treating and infiltrating/attenuating surface water run-off generated from the site, prior to discharging into the local surface water network at an agreed rate.

9.9.4 Water quality monitoring will be assessed downstream of key construction works (access tracks and turbine foundations) prior to and during the construction period.

9.9.5 The anticipated impact to water quality during the operation phase is anticipated to be minimal.

Residual Risk

9.9.6 Residual risk is that which remains after the flood risk management measures set out above have been taken into account. It is anticipated that as the assessment of potential impacts would inform the design of the Study Area and best practice measures would be implemented during the construction, operation and decommissioning of the Development, that significant residual effects to the hydrological environment would be avoided. However, if potential significant residual effects to the geological and water environment are identified through the assessment process described above, suitable mitigation measures will be set out in the subsequent EIA.

9.10 QUESTIONS FOR CONSULTEES

9.10.1 Blaenau Gwent CBC, Torfaen CBC, NRW and other relevant consultees in relation to the water environment are asked to consider the following questions:

Question 9.1	Is there any other baseline information on the hydrological environment that should be assessed?
Question 9.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the hydrology receptors?
Question 9.3:	Have all relevant potential impacts on hydrology been identified that might arise from the Development?
Question 9.4	Do you agree with the hydrology impacts that have been scoped in and out of the assessment, together with the reasons for doing so?
Question 9.5	Are the embedded mitigation measures sufficient to avoid the significant impacts identified?

10 HYDROGEOLOGY, GEOLOGY & GROUND CONDITIONS

10.1 INTRODUCTION

10.1.1 This chapter describes the proposed scope of the assessment of effects, with respect to Hydrogeology and Ground Conditions, arising from the Development. It includes consideration of hydrogeology, geology, land contamination, and soil receptors. The chapter should be read in conjunction with the description of the Development presented in Chapter 3: The Development, and with respect to relevant parts of other chapters, such as Chapter 5: Ecology and biodiversity, Chapter 9: Hydrology, and Chapter 15 Climate change where there is an overlap or relationship, e.g., hydrogeology.

10.1.2 The scope of the assessment is based on a review of desk-based baseline information and will be confirmed through review of additional data sources and a site walkover, the findings of which will be reported in the Environmental Statement.

10.2 RELEVANT LAW, POLICY & GUIDANCE

10.2.1 This scoping report chapter has been prepared in line with the relevant planning policy documents outlined in Chapter 3: Legislation and planning policy overview. In particular, attention has been paid to the documents listed in Table 10.1.

10.2.2 The Development site covers two local authority areas: Blaenau Gwent in the west and Torfaen in the east and reference is, therefore, made to relevant policy applicable in both regions.

Table 10-1: Policy and legislation relevant to geology, land contamination and soils

Legislation/Planning policy	**Description**
Legislation	
The Environment (Wales) Act 2016	The Act makes provisions within Wales for the planning and managing of natural resources at national and local level.
Well-being of Future Generations (Wales) Act (2015)	The Act does not refer explicitly to soils; however, it requires public bodies in Wales to think about the long-term impact of their decisions. It requires them to act in accordance with sustainable development principles, with the aim of achieving well-being goals, including maintaining and enhancing a biodiverse natural environment with healthy functioning ecosystems that support social, economic, and ecological resilience and the capacity to adapt to change (for example climate change).
Policy	

Legislation/Planning policy	Description
Future Wales: The National Plan 2040	Policies 17 and 18 of Future Wales provide policy support for renewable and low carbon energy and associated infrastructure; and renewable and low carbon energy developments of national significance, respectively. Policy 18 includes criteria to ensure that no adverse effects on internationally designated sites and features for which they have been designated are impacted.
Planning Policy Wales, Edition 11 2021	The 2021 Planning Policy Wales document, Distinctive and Natural Linkages chapter, page 124, states that decisions on planning applications must consider the policy topics of the Distinctive and Natural Places theme, including "*opportunities in all areas to improve the resilience of ecosystems by addressing building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources*" and "*opportunities to improve health and well-being are taken, in particular, to… ensure water sensitive design, address soil carbon management… so as to improve capacity for adaptability to the challenges of climate change such as flood risk and increased temperatures*". Chapter 6, Section 6.4 Biodiversity and Ecological Networks states that development proposals must consider the need to: "*safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat*". Chapter 6, Section 6.9.16 Land Contamination sates that "*Whenever development or re-development potential exists the planning system will be the preferred means of addressing potential land contamination.*" It also states that "*Where land contamination issues arise, the planning authority will require evidence of detailed investigation and risk assessment prior to the determination of the application*" as well as "*If contamination cannot be overcome satisfactorily, the authority may refuse planning permission.*" **Minerals** See 'Minerals' notes below in relation to the Blaenau Gwent and Torfaen Local Development Plans.
Blaenau Gwent Local Development Plan (LDP) 2012	The LDP identifies where allocations for new developments such as housing, employment, community facilities, and roads have been made. It provides a framework for local decision making and brings together both development and conservation interests to ensure that any changes in the use of land are coherent and provides maximum benefits to the community. Policy DM1 requires new development to demonstrate sustainable design, including minimising construction waste and pollution and no adverse impact upon the water environment or an unacceptable risk to the quality of controlled waters, and that the land is made stable and capable of supporting the development

Legislation/Planning policy	Description
	without risk of damage to buildings on the site or adjoining land, and that practicable and effective measures are taken to treat, contain or control any contamination. Section 7.14 notes that much of the Blaenau Gwent area was subject to past underground mining activities and is therefore within a Coal Mining Referral Area. Responsibility for determining the extent and effects of these constraints' rests with the developer. Where development is proposed in these areas, the developer should consult with the Coal Authority. The Local Planning Authority will be guided by advice from the Coal Authority and the Council's own technical staff whether development is acceptable and whether conditions requiring ground stability precautions should be attached to permissions. In other instances, development may affect landslip areas. In such instances, applications will need to be supported by a geotechnical investigation and stability report to identify any remedial measures to deal with any instability. Section 7.15 notes that the disturbance of contaminated land can have risks to public health and the environment. Where development is proposed on sites known, or suspected to be contaminated, or where the site is in the vicinity of a former landfill site, the developer will be required to carry out a risk assessment at the planning application stage. This must establish any possible pollutant pathways and identify all necessary mitigation measures, if any, to reduce the risks and allow development to proceed. **Minerals** The LDP identifies Aggregates Safeguarding Areas, Coal Safeguarding Areas and Mineral Buffer Zones within the Site. Policy DM19 Minerals Safeguarding states that development proposals will not be permitted where they would permanently sterilise important mineral resources… unless: the mineral resource is recovered before development commences, the developer satisfactorily demonstrates that the extraction of the mineral is impracticable, uneconomic or environmentally unacceptable, the scale and location of the development would have no significant impact on the possible working of the resource, or, the development is temporary and could be implemented and the site restored within the timescale the mineral is likely to be required. In relation to the coal deposits likely to underlie the Site, the Welsh Government's Planning Policy Wales Edition 11 (2021), 5.7.7 notes the benefits of renewable and low carbon energy, as part of the Welsh Government's overall commitment to tackle the climate change emergency and increase energy security, and states that the planning system should maximise renewable and low carbon energy generation and move away from the extraction of energy minerals.
Blaenau Gwent Local Agenda 21 Strategy 2001	This document describes the council's commitment to the sustainable care of natural and physical resources in accordance with the Agenda 21 process. The key components of the document address the current sustainability challenges and

Legislation/Planning policy	Description
	issues, the council's responsibilities, targets and current situation, action plans and implementation mechanisms.
Torfaen LDP (2013)	The eastern and central portions of the Site are in the North Torfaen area. The LDP seeks to protect and enhance biodiversity resources including Site of Special Scientific Interest (SSSIs), SINCs (Sites of Importance for Nature Conservation) and Local Nature Reserves (Section 2.4.4) and promote the remediation of contaminated sites (Section 2.4.5). Policy BW1 states that development proposals will be considered favourably where they comply with the listed criteria, including: - B Natural Environment i) The proposal does not result in unacceptable adverse effects in respect of land contamination, instability or subsidence; …landfill gas; water pollution; or flooding, from or to the proposal, ..vi) The proposal does not have an unacceptable adverse impact upon the water environment or pose an unacceptable risk to the quality … of controlled waters, … - C Built Environment …iii) Where practicable, existing construction materials on the site are re-used or recycled. Section 6.1.7 notes that landscape features covered by Policy BW1 include … peat bogs… which are… important features of the biodiversity network. In relation to geodiversity (the variety of soils, rocks, fossils, minerals and natural processes that make up the Earth's physical landscape and structure) and designated geological sites (either an SSSI or Regionally Important Geological Site (RIGS)), proposals affecting geodiversity assets will be assessed against Policy BG1. Policy BG1 states that development proposals will not be permitted where they would cause significant adverse effects to local nature conservation designated sites (including the features of SINCs or RIGS unless it can demonstrated that: a) the development could not reasonably be located elsewhere and the benefits of the Development outweigh the nature conservation or geological value of the site; and b) adequate mitigation and/or compensatory provision is made proportionate to; or an enhancement to the value of the ecological resources or geological site lost. Section 8.48.3 notes that the RIGS identified in the Proposals Map, which include Llanhilleth Quarry (Tir Pentwys) are mainly exposures of geological formations and that it would be easier to mitigate/compensate for their loss locally, for example by exposing other parts of the formation as part of the development proposal or a restoration scheme. The Adopted Torfaen Local Development Proposals Plan shows the Site is partially within a Special Landscape Area, includes areas designated as SINCs and a Regionally Important Geological Site (RIGS) Tir Pentwys.

Legislation/Planning policy	Description
	Minerals The Proposal Map shows the Site is in a Coal Safeguarding Area and an Aggregate Safeguarding Area, and includes the Tir Pentwys Preferred Area for Aggregates (includes the former Llanhilleth Quarry and adjacent land to the south, south-east), where proposals for the extraction of 7.2 million tonnes of aggregates may be permitted. Policy M1 Minerals Safeguarding states that Development proposals will not be permitted which would permanently sterilise important mineral resources within the Aggregate Safeguarding Areas or Coal Safeguarding Areas identified on the Proposals Map, unless there is an overriding need for the proposed development and: - a) the Mineral resource is recovered before the proposed development commences; or b) the developer has satisfactorily demonstrated that the extraction of the mineral is impracticable, uneconomic or environmentally unacceptable. Section 8.31.1 states that in accordance with national policy the LDP should safeguard aggregates and shallow coal resources from permanent development that would prevent their future extraction, and it is noted that, according to Minerals Planning Policy Wales (MPPW - paragraph 13), safeguarding "does not necessarily indicate an acceptance of working, but that the location and quality of the mineral is known, and that the environmental constraints associated with extraction have been considered." Section 8.31.2 clarifies that Aggregate Safeguarding Areas (ASAs) have been identified to safeguard potential high quality sandstone and limestone aggregate resources within the County Borough, which are shown on the Proposals Map. It is noted that the Torfaen ASAs, are based upon the Welsh Government's recently published 'Aggregates Safeguarding Map of Wales - 2012', which includes a 200m 'safeguarding margin' around the aggregate resource. Therefore, the Torfaen ASAs do not align with the ASAs of neighbouring LDPs, which were designated before the publication of the Torfaen map and only safeguard the aggregate resource itself.

10.3 BASELINE CONDITIONS

Data Sources

10.3.1 The EIA scoping exercise has been undertaken with reference to Chapter 3: The Development, supported by several data sources. The principal data sources used to inform this chapter comprise the following:

- Multi-Agency Geographic Information for the Countryside (MAGIC) interactive map for topography and features (available online https://magic.defra.gov.uk/MagicMap.aspx; accessed March 2021);

- British Geological Survey (BGS) GeoIndex Onshore for geological information, including exploratory hole records (available online https://mapapps2.bgs.ac.uk/geoindex/home.html l; accessed March 2021);
- Coal Authority Interactive Map for mining information (available online https://mapapps2.bgs.ac.uk/coalauthority/home.html; accessed March 2021);
- National Library of Scotland for historical maps (map coverage includes Wales, available online https://maps.nls.uk/; accessed March 2021);
- LandIS Soilscapes Map, (available online http://www.landis.org.uk/soilscapes/#; accessed March 2021); and
- Welsh Government and Natural Resources Wales Lle Geo-Portal, Unified Peat Map of Wales (available online http://lle.gov.wales/map#m=-3.14949,51.74255,13&b=europa&l=1738; accessed March 2021).

Current Baseline

10.3.2 This section provides a high-level review of the current baseline environmental characteristics for the Development, with reference to the hydrogeology and ground conditions. The baseline conditions will be confirmed through review of additional data sources, site visits, ground investigation and consultation with stakeholders during the next stages of the EIA.

10.3.3 The topography and environmental setting of the Site are also summarised in this section as these conditions affect the sensitivity of the receptors discussed in Section 10.4.

Study Area

10.3.4 The study area for ground conditions comprises a 500m buffer surrounding the Site. This is considered appropriate based upon professional experience in land condition assessment and with regard to the hydrogeological conditions of the Site and surrounding area. Impacts on soil receptors, including peat, caused by development generally occur within the development boundary and the study area for these receptors is, therefore, focused on this Site.

Current and Historical Land Use Within the Site and Study Area

10.3.5 The former Llanhilleth Quarry (Tir Pentwys, also known as 'The Canyons') is in the south of the Site, spoil heaps are present around water-logged quarried areas and have been planted with conifers. Inspection of historical maps (available online from the National Library of Scotland) indicates that the Site has been used historically for opencast mining, and there is evidence of coal mining and quarrying in the surrounding area. For example, a first series Ordnance Survey (OS) County Series map (1842 – 1952) shows old quarries and old coal levels immediately west of the site. Mapping from 1960 to 1964 shows opencast workings across most of the site and infilled ground in the north-east of the site, east of St Illtyd. A coal mine and a dismantled railway are shown immediately east of the site near the Nant Ddu watercourse. Tirpentwys Colliery is recorded south of the Site and operated between 1878 and 1969. Current OS mapping viewed on the MAGIC interactive map and Bing maps shows tips (disused) likely to be spoil heaps associated with former mineral extraction close to the site boundary in the north-west of the site and the south-west of the site at Ty-gwyn, Nant Ffrwd-oer. A disused shaft is also shown approximately 400m from the Site at Nant Ffrwd-oer. Since then, the site has been restored as grassland used for grazing with areas of coniferous and broadleaved woodland.

Topography

10.3.6 The Site comprises the high lying ground of Mynydd Llanhilleth. The highest point is at the northern boundary at approximately 460m above Ordnance Datum (AOD) and the central areas slope gently down towards the south, falling to around 350m AOD. The Cwm Du valley divides the northern and central/southern sections and the north-eastern extent of the site slopes steeply to the south at Cwm Du valley. The north-western area of the Site slopes steeply down to the south at Cwm Cyffin valley and the south-western area slopes steeply to the west at Cwm Cnyw valley. The south-east area of the site slopes down to the south-east to approximately 350m AOD and steeply to east at the valley through which the Nant y Caws watercourse flows. The former Llanhilleth Quarry (Tir Pentwys, also known as 'The Canyons') is in the south of the Site, the quarried areas form a series of linear features running roughly east to west, some of which are water-logged, surrounded by steeply sloping spoil heaps and exposed rock.

Soils

10.3.7 Information reviewed on the LandIS Soilscapes map indicates the likely soil types within the Site boundary comprise mainly restored soils mostly from quarry and opencast spoil (type 24), there are also two areas shown to have very acid loamy upland soils with a wet peaty surface (type 16), located along the northern edge of the Site and in the south central area of the Site. In the remainder of the Site (area immediately north of the Cwm Du valley and areas at the western and eastern boundaries) the natural soils are shown as freely draining acid loamy soils over rock, with a loamy texture and medium carbon content (type 13).

10.3.8 The Unified Peat Map of Wales shows no peat deposits on the Site.

10.3.9 An Extended Phase 1 Habitat Survey (see Chapter 5: Ecology and biodiversity) has identified habitat types that indicate the possible presence of peat. There is limited potential for peat to be present on the Site due to the extent of historical opencast mining and subsequent land restoration, however, there is potential for some peat based on the Soilscapes map information along the northern edge of the Site and in the south central area of the Site.

Geology

10.3.10 The British Geological Survey (BGS) 1:50,000 scale geology mapping shows superficial deposits are thin or absent within most of the Site, till (diamicton) is shown in the north-east of the site. The mapping generally indicates that bedrock is close to surface (<10m below ground level) or at surface and exposed rock is visible at the former Llanhilleth Quarry in the south of the Site. In the wider study area, alluvial deposits (clay, silt, sand and gravel) are present associated with the valley of Cwm Du, through which the watercourse, known as the Nant Ddu flows. Details of watercourses close to the Development are provided in Chapter 9: Hydrology.

10.3.11 The British Geological Survey (BGS) GeoIndex Onshore map indicates that bedrock geology on the Site comprises the Grovesend Formation, described as "predominantly argillaceous, comprising mudstones and siltstones, with well-developed coals; minor lithic ("Pennant") sandstones; locally developed red mudstones in the type area" and the Hughes Member, which is described as "green-grey, lithic arenites …, with thin mudstone/siltstone and seatearth interbeds, and mainly thin coals" , of the Pennant Sandstone Formation.

10.3.12 The BGS 1:50,000 scale mapping shows artificial ground across most of the Site, comprising made ground (artificial deposit) and worked ground (void) within the Development.

10.3.13 The BGS GeoIndex 1: 50,000 scale mapping of linear features indicates there are three geological faults within the Site boundary, one in the north-east on a roughly north to south axis, one in the east on a west to east axis, and one in the south-west on a north-west to south-east axis. Several observed and inferred coal seams are shown in the central area of the Site and in the south-west portion of the Site.

10.3.14 Inspection of the BGS Geology of Britain Viewer indicates one borehole record on the Site, identified as B.H. No.4, Blaenserchan Colliery. There are also come borehole records located in Cwm Du valley, between the northern and central areas of the Site, including one referenced as NCB. U.G.B.H. No.1, Blaenserchan Colliery. U.G.B.H. No. 1 was progressed from the horizon of Meadow Vein ("seven feet seam") and recorded sequences of mainly mudstone, coal, sandstone, siltstone, pyritous coal, seatearth, ironstone, also from 60m depth, some conglomerate, grit and limestone were encountered before the base of the hole at 102m. B.H. No.4 was advanced at an angle of 38◦ to the horizontal and encountered sandstone, seatearth and coal.

10.3.15 A geo-environmental desk study will be produced as part of the assessment process for the Development to update the baseline in relation to potential ground stability issues associated with the Site's geology.

Geodiversity

10.3.16 The MAGIC interactive database indicates that there are no geological SSSIs located within the Site or in the wider study area.

10.3.17 The Natural Resources Wales dataset for Regionally Important Geodiversity Sites (RIGS) was consulted and indicates there are no RIGS within the Site or in the wider study area. However, the Torfaen LDP Proposals Map identifies that the former Llanhilleth Quarry (Tir Pentwys) located within the large, wooded area in the southern portion of the Site has been designated as a RIGS. This area is not included in the indicative developable area, as show in Figure 3.1.

Coal Mining and Mineral Extraction

10.3.18 Tir Pentwys former open cast coal mine is located on the Site and historical maps shows coal mines near the Site.

10.3.19 Furthermore, inspection of the Coal Authority Interactive Map for mining information indicates that the site is situated within a Coal Mining Reporting Area and, therefore, we recommend consultation with the Coal Authority. Additionally, interrogation of the interactive maps indicates that, within or in the immediate vicinity of the Site, there exist:

- Mine entries (adits and shafts);
- Mine entry potential zones of influence;
- Surface mining (past and current);
- Surface coal resources;
- Past shallow coal mine workings;
- Coal outcrops; and
- Development high risk areas.

10.3.20 A geo-environmental desk study will be produced for the Development to update the baseline in relation to potential ground stability or other issues associated with historical mining activity.

10.3.21 Based on the review of the Coal Authority Interactive Map, a mining risk assessment is needed, and this will be produced for the Development to update the baseline.

Minerals

10.3.22 The Development is within an Aggregates Safeguarding Area, Mineral Buffer Zone and Preferred Area defined in the Blaenau Gwent Local Development Plan 2012. In relation to coal resources, Welsh Government planning policy is to move away from extraction of energy minerals. Further information is needed regarding the mineral safeguarding designations on the Site, and this will be sought from the relevant consultees to inform the EIA.

10.3.23 The BGS GeoIndex minerals dataset shows the Site is underlain by sandstone with potential for high specification aggregate and is in a secondary and tertiary opencast coal resource area.

10.3.24 Information in the Torfaen LDP and on the Torfaen Council website indicates that there is a planning application for recovery of secondary aggregates from the former open-cast coal mining spoil heap at Tir Pentwys, within the Site, last updated in 2016. As the windfarm development footprint will only occupy a small proportion of the Site and the wind turbines will not be located on the spoil heaps, it is proposed that effects on minerals can be scoped out of the EIA.

Hydrogeology

10.3.25 The Grovesend Formation and the Hughes Member underlying the study area are classified by NRW as Secondary A Aquifers. Secondary A Aquifers are defined as “permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers”. These are generally aquifers formerly classified as minor aquifers. The till deposits are classified as Secondary Undifferentiated aquifers. These are assigned in cases where it has not been possible to attribute either category Secondary A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

10.3.26 A well is shown on OS mapping in the west of the Site.

10.3.27 The Grovesend Formation and the Hughes Member underlying the study area are part of a designated WFD groundwater body (SE Valleys Carboniferous Coal Measures GB40902G201900) and achieved ‘Good’ quantitative status and ‘Poor’ overall and chemical status in the 2016 WFD classification (Cycle 2).

10.3.28 The Site and the wider study area are not within a source protection zone (SPZ). The closest SPZ is located approximately 1.75km to the north-east of the Development.

Groundwater Flood Risk

10.3.29 Groundwater flooding occurs as a result of water issuing to the surface from the underlying aquifers. This tends to occur after long periods of sustained high rainfall, with areas most at risk being situated on permeable geology and low-lying compared to the local water table.

10.3.30 Blaenau Gwent County Borough Council Local Flood Risk Management Strategy (2013) states there are no reports of historical groundwater flooding within the borough area.

10.3.31 Torfaen County Borough Council Flood Risk Management Plan (2015) does not record significant groundwater and states that: “The South Wales coal field is regarded as a minor aquifer and the permeable carboniferous limestone is deemed a major aquifer, despite the underlying geology

presenting ample stratigraphy to allow for high levels of groundwater, the topography of the area having a high relief, channels the groundwater to the valley floors quickly limiting the amount of percolation and increasing the amount of surface runoff."

10.3.32 The Site has limited superficial cover. BGS mapping shows the underlying bedrock to comprise the Grovesend Formation (argillaceous mudstones and siltstones, with well-developed coals) and the Hughes Member (a cyclical sequence of sandstone, mudstone, siltstone and coal seam layers). Both are classified as a Secondary A aquifer, though the Grovesend Formation may have lower permeability due to its clay content. Although groundwater emergence may be possible, any flows are expected to be limited/small as the Site is on a topographic high and the underlying geology comprises bands of both higher and lower permeability bedrock layers. This is consistent with the EA Areas Susceptible to Groundwater Flooding Map which shows that the risk of groundwater flooding in the Site is less than 25%. This suggests that although some groundwater may be encountered during excavations in the Site, groundwater is unlikely to be found in significant quantities, and is not assessed to be a significant potential flood risk.

Land Contamination

10.3.33 Historical mapping and records indicate that extensive opencast coal mining has occurred on the Site and several former coal mines operated in the immediate surrounding area so there is the potential for contamination or waste from this activity to be present on the site. Spoil heaps are present onsite at the former Llanhilleth Quarry.

10.3.34 Information available from Natural Resources Wales indicates historical landfills are present within the study area, the nearest is approximately 380m south-east of the Site.

10.3.35 A geo-environmental desk study will be produced for the Development to update the baseline in relation to potential land contamination.

Environmental Setting: Hydrology and Sensitive Land Uses

10.3.36 A detailed description of hydrology is presented in Chapter 9: Water Environment. In summary, the nearest watercourses are the:

- Nant y Caws, which issues within the Site and flows to the south-east.
- Nant y cynw which issues within the Site and flows to the south-west.
- An unnamed stream which issues within the Site and flows to the south.
- Nant Cyffin which issues at the Site boundary and flows west.
- Nant Ddu which issues at the Site boundary and flows east.
- Nant y Groes, which flows west to the north of the Development.
- An unnamed stream which flows east to the north of the Development.

10.3.37 There are also ponds/lakes within the Site and wider study area, and springs within the study area.

10.3.38 The nearest designated ecological site is the Tirpentwys Local Nature Reserve (LNR) immediately south of the Site. The Tirpentwys LNR is on a former landfill and colliery site and contains ancient beech woodland in addition to a reclaimed area of grassland, ponds, quarries and streams. Bird species using the area include tree pipit, nuthatch, great spotted and green woodpeckers, and long-winged conehead crickets are also found on the rough grassland throughout the reserve.

10.3.39 Tirpentwys Cut on part of the Site (parts of the former Llanhilleth Quarry – Tir Pentwys) is identified in the LDP as a Site of Importance for Nature Conservation (SINC) which includes mosaic habitats,

bog habitats and flushes, standing open water and rock exposures, in addition the coniferous plantation habitat supports important species.

10.4 ASSESSMENT METHODOLOGY

Potential Receptors

10.4.1 Receptors identified as having potential to be subject to significant effects in relation to land contamination are listed below:

- Human health for future site users and adjacent site users;
- Controlled waters;
- Ecological receptors (LNR adjacent to the Development); and
- Property (built environment including services).

10.4.2 The Development could potentially result in effects on receptors due to land instability as listed below:

- Human health for future site users and adjacent site users;;
- Soils (topsoil and subsoil);
- Controlled waters;
- Ecological receptors (LNR immediately south); and
- Property (crops, grazing animals, built environment including services).

10.4.3 The Development has the potential to have significant effects on soils (topsoil and subsoil) potentially including peat, through ground disturbance activity, compaction, soil sealing and the temporary or permanent displacement of soil during construction. The extent of peat on site is likely to be limited, if present at all, and it may be possible to avoid it entirely by locating the windfarm infrastructure in other areas, however, at this stage effects on soil/peat have not been scoped out.

10.4.4 The hydrogeological receptors identified in this high-level assessment as having potential to be affected by the development comprise:

- Groundwater in the Grovesend Formation and the Hughes Member (Secondary A Aquifers and WFD groundwater body).
- Groundwater abstractions within the study area (if present).
- Springs within the study area.
- Conservation sites within the study area that are water dependent (SINC on the Site, Tirpentwys Local Nature Reserve (LNR) immediately south).

10.5 LIKELY SIGNIFICANT EFFECTS

10.5.1 The likely significant hydrogeology and ground condition effects that will be taken forward for assessment in the Environmental Statement are summarised in Table 10.2.

Table 10-2: Likely significant ground condition and hydrogeological effects

Activity	Effect	Receptor
CONSTRUCTION PHASE		
Construction activities on land where peat or other sensitive soils are potentially present: • Use of plant and machinery, vehicle movements. • Excavation including temporary or permanent displacement of soil to construct foundations and tracks or temporary tracks and hardstanding for cranes and compounds • Temporary storage of soils and dewatering activities	Permanent loss of soils including soil sealing due to construction of hard surfaced areas, potential for changes in site hydrogeology and hydrology.	Soils (may include peat) Groundwater in Grovesend Formation and the Hughes Member (WFD groundwater body and Secondary A Aquifer) Ecological receptors (Local Nature Reserve to the south, SINC within the Site)
Construction activities on land where mining has taken place: • Use of plant and machinery, vehicle movements • Excavation including temporary or permanent displacement of soil to construct foundations and tracks or temporary tracks and hardstanding for cranes and compounds • Temporary storage of soils and dewatering activities	Potential for changes in site hydrogeology (including mine water flows), potential for changes in the site's ground gas regime Potential effects associated with land instability	Springs within study area Groundwater in Grovesend Formation and the Hughes Member (WFD groundwater body and Secondary A Aquifer) Local groundwater abstractions (if present) Local conservation sites that are water-dependent Soils (topsoil and subsoil) Ecological receptors (Local Nature Reserve) Human health for future site users and adjacent site users Soils Controlled waters

Activity	Effect	Receptor
		Ecological receptors (LNR immediately south) Property (crops, grazing animals, built environment including services) Built environment
Construction activities located on land potentially affected by contamination	Mobilisation of contaminants due to ground disturbance e.g., dust generation, contaminated run-off, creation of new pollutant migration pathways during excavation or construction, failure to manage and segregate excavated materials appropriately	Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways) Controlled waters: groundwater and surface water Ecological receptors (Local Nature Reserve) Property (crops, grazing animals, built environment including services) Soil (topsoil and subsoil)
	Identification and remediation of contaminated land to allow the development to proceed	Human health: future site users and adjacent site users (by direct contact, inhalation or ingestion pathways) Controlled waters: groundwater and surface water Soil (topsoil and subsoil)

10.5.2 The effects scoped out from further assessment in the EIA are:

- Potential effects on land or groundwater quality during the construction phase due to accidental release of contaminants (including oils, fuels, chemicals and waste) from construction plant or machinery or waste storage points e.g., accidental spillages or leaks, or due to release of silty or otherwise contaminated groundwater from excavations, as these risks can be adequately managed through the Construction Environmental Management Plan (CEMP), and significant effects are, therefore, unlikely.
- Potential effects on geodiversity through physical changes to or loss of access to the designated RIGS at Llanhilleth Quarry have been scoped out on the basis that the RIGS is outside the developable area identified for the Development.
- Potential effects on mineral reserves: although a planning application has been submitted for recovery of secondary aggregates from the former open-cast coal mining spoil heap at Tir

Pentwys, it is understood that this development, if approved, would not impact on the remaining undisturbed coal or other mineral resources, and Tir Pentwys is outside the developable area identified for the Development. No planning applications to extract coal or other undisturbed mineral resources beneath the developable area of the Development site are known of and given that the Development footprint will only occupy a small proportion of the Site it is proposed that effects on minerals can be scoped out of the EIA.

10.5.3 Impacts during decommissioning are likely to be similar to those identified during the construction phase. However, dependent on the exact nature of the decommissioning activities that take place, it is likely that ground disturbance would be less. Mitigation similar to that implemented during the construction and operational phases (updated to reflect changes in legislation/guidance) should also help to ensure that the significance of such impacts is minimised. It is, therefore, proposed that assessment of decommissioning effects is 'scoped out' from detailed assessment in the EIA.

10.5.4 The stability of the ground, as far as it affects land use, is a material consideration that is taken into consideration in planning application decisions. Land stability in relation to the ground conditions of the Site will be addressed throughout the design and construction process by compliance with the Construction (Design and Management) Regulations 2015 and will be informed by the geo-environmental desk study, the mining risk assessment, the Phase 1 peat depth survey, and any further relevant surveys undertaken. It will not be assessed further during the EIA process.

10.6 ASSESSMENT METHODOLOGY

General Approach

10.6.1 This section describes the approach for the assessment of the ground condition and hydrogeology related effects of the Development on receptors. The proposed approach will be confirmed with Natural Resources Wales (NRW) and the local planning authorities (LPAs) during the next stages of the EIA.

10.6.2 The generic project-wide approach to the assessment methodology is set out in Chapter 4: The Environmental Impact Assessment process. This section describes how this methodology will be applied, and adapted as appropriate, to address the specific conditions on the Development site in relation to the hydrogeology, land contamination and soil (including peat) assessment.

Land Contamination Approach

10.6.3 The effect of the Development will be assessed through desk-based studies to understand the baseline environment relevant to soil (specifically the identified potential for peat), hydrogeology, geology and contamination status. Consultations with NRW and the LPA will be undertaken to obtain more local detailed information.

Risk Assessment

10.6.4 With respect to potential contaminated land, the process of managing land contamination, as set out in the Environment Agency guidance Land Contamination: Risk management (LCRM), as adopted by NRW, is based on risk assessment. The assessment of risks from contaminated land is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of a:

- Source of contamination

- Receptor that can be adversely affected by the contamination
- Pathway capable of exposing a receptor to the contaminant

10.6.5 The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following.

- The magnitude of the potential consequence (for instance, severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor.
- The magnitude of probability (for instance, likelihood). It takes into account both the presence of the hazard and receptor and the integrity of the pathway.

10.6.6 The definitions for the qualitative risk assessment have been taken from "Guidance for the Safe Development of Housing on Land Affected by Contamination" Annex 4 R&D Publication 66: 2008 Volume 2.

10.6.7 The likelihood classifications for the contaminant linkages being realised is presented in Table 10.3.

Table 10-3: Likelihood classifications for contaminant linkages

Classification	Definition	Examples
High Likelihood	There is contaminant linkage and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5m in a residential garden. b) Ground/groundwater contamination could be present from chemical works, containing a number of USTs, having been in operation on the same site for over 50 years.
Likely	There is contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0m in a residential garden, or the top 0.5m in public open space. b) Ground/ groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.

Low Likelihood	There is contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1m in a residential garden, or 0.5-1.0m in public open space. b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last ten years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding. b) Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.

10.6.8 The magnitude of the potential consequence of a contaminant linkage gives an indication of the sensitivity of a given receptor to a particular source or contaminant of concern under consideration. It is based on full exposure via the linkage being examined. The classification of consequence is presented in Table 10.4.

Table 10-4: Classification of consequence

Classification	Human Health	Controlled Water	Ecology	Property	Examples
				Structures/ Crops and animals	
Severe	Highly elevated concentrations likely to result in "significant harm" to human health as defined by the EPA 1990, Part 2A, if exposure occurs.	Equivalent to Environment Agency (EA) Category 1 pollution incident including persistent and/or extensive effects on water quality; leading to	Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (e.g. cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants from site. Highly elevated

Classification	Human Health	Controlled Water	Ecology	Property Structures/ Crops and animals	Examples
		closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	interest that endangers the long-term maintenance of the population.		concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in "significant harm" to human health as defined by the EPA 1990, Part 2A if exposure occurs.	Equivalent to EA Category 2 pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.	Significant damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance as death, life threatening diseases (e.g. cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Damage to building rendering it unsafe to occupy e.g. foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to "significant harm".	Equivalent to EA Category 3 pollution incident including minimal or short-lived effect on water quality; marginal effect on amenity	Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a	Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (e.g. mild skin rash). Surface spalling of concrete.

Classification	Human Health	Controlled Water	Ecology	Property	Examples
				Structures/ Crops and animals	
		value, agriculture or commerce.	species of special interest that would endanger the long-term maintenance of the population.		
Minor	No measurable effects on humans.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Equivalent to insubstantial pollution incident with no observed effect on water quality or ecosystems.	Repairable effects of damage to buildings, structures and services.	The loss of plants in a landscaping scheme. Discoloration of concrete.

10.6.9 The risk matrix to link the likelihood and consequence is shown in Table 10.5.

Table 10-5: Risk Matrix

		Likelihood			
		Unlikely	**Low Likelihood**	**Likely**	**High Likelihood**
Potential consequence	**Severe**	Moderate/low risk	**Moderate Risk**	**High Risk**	**Very High Risk**
	Medium	Low	Moderate/low risk	**Moderate Risk**	**High Risk**
	Mild	Very low risk	Low Risk	Moderate/low risk	**Moderate Risk**
	Minor	Very low risk	Very low risk	Low Risk	Low Risk

10.6.10 The overall risk definitions are summarised in Table 10.6.

Table 10-6: Risk Definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to be site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

10.6.11 It is important that the initial assessment and classification of risk is carried out prior to environmental measures being embedded into the development proposals. This then allows the environmental measures to be targeted at the risks and the assessment of significance of the change in risk resulting from the Development to be carried out with the measures embedded to be consistent with approach used in respect of other environmental topic assessments.

10.6.12 Where a risk classification of moderate or greater has been determined, it has been assessed that the source–pathway–target contaminant linkage requires some form of risk management or intervention.

10.6.13 As the first step, such risk management or intervention would normally take the form of either further investigation, with the additional knowledge gained allowing the risk to be more accurately assessed and potentially the classification may be lowered. However, if the risk classification remains at moderate or above then remediation, in the form of embedded mitigation, may be required to reduce or remove the source of contamination or disrupt the pathway to the target or receptor.

Significance Evaluation Methodology

10.6.14 To use risk assessment as the basis for the evaluation of the significance of effects in relation to land contamination, it is necessary to evaluate the change in risk from baseline conditions to those during and following the Development. In order to define the baseline risk the initial assessment and classification of risk is carried out for the study area in its pre-development state. A separate assessment of risk will then be conducted for the site post-development (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Development.

10.6.15 Table 10.7 uses the risk classification pre- and post-development as the basis for a significance evaluation matrix for the purposes of EIA.

Table 10-7: Land quality (contamination) significance evaluation matrix

			Risk post-development (including embedded measures)					
			Very Low	**Low**	**Moderate / Low**	**Moderate**	**High**	**Very High**
Risk pre-development	**Existing receptors**	**Very High**	Major Positive (Significant)	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
		High	Major Positive (Significant)	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)
		Moderate	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)
		Moderate / Low	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)
		Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)

		Very Low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)
	No receptor present pre-development	**N/A**	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	Major Negative (Significant)	Major Negative (Significant)
Risks that remain at moderate, high or very high post-development are unlikely to be considered acceptable and further mitigation will be required to enable the development to proceed.								

10.6.16 If the embedded measures are effective the risks post development should be less than moderate or the risks from the Development are likely to be considered unacceptable.

10.6.17 However, there may be circumstances where development can proceed, and moderate and above risks remain, e.g. groundwater contamination where cost benefit analysis indicates that remediation is not warranted.

10.6.18 Guidance on the protection of the environment will be used to assist with the development of mitigation e.g. NRW and CIRIA. The assessment will be based on the implementation of those mitigation measures identified, which will feed into the construction environmental management plan (CEMP), method statements and procedures for the Development. In particular, these will cover the control of drainage runoff from excavations and access tracks and the formation of turbine footings. These measures will reflect current best practice in the industry and will serve to prevent increases in pollution and sediment-loading.

10.6.19 The Environmental Statement chapter will summarise the findings of the desk study and ground investigation, this forming the baseline against which the potential impact of the Development, alone and cumulatively with other developments, would be assessed. The assessment will be based on both receptor importance and the nature and magnitude of the impact as a result of the Development and all mitigation assessed to be necessary will be identified and residual effects with this in place will be determined.

Soils and Peat Approach

10.6.20 There is some potential for peat to be present within the Development site, and based on the available information, the potential for peat will be confirmed by a limited soil sampling exercise in areas identified on the Soilscapes mapping as having potential for peaty soils.

10.6.21 If this survey confirms the presence of deep peat, and the relevant area cannot be avoided, this will be followed up with a higher resolution peat survey targeting the proposed locations of the windfarm infrastructure. In the absence of any guidance from NRW the Phase 2 survey will be conducted in accordance with best practice guidance document “Peatland Survey. Guidance on Developments on Peatland” published by the Scottish Government and NatureScot. The survey will comprise:

- A 10m by 10m grid of peat depth probing points within the turbine micro-siting areas, substation and temporary construction compound (if required).
- Peat depth probing locations every 50m along any new or upgraded access tracks with a probe point 10m perpendicular to either site of the proposed access tracks.

- Additional peat depth probing at the crane pads and turning heads as required.

10.6.22 If necessary based on the findings of the peat depth survey, detailed information and plans for peat management will be included in a Peat Management Plan presented as a Technical Appendix to the Environmental Statement. The Peat Management Plan will include details on the:

- Distribution of peat across the Site (depicted on peat depth maps with the wind farm elements overlain).
- Characteristics of the peat.
- Measures taken to avoid deep peat and minimise disturbance. Where necessary measures to re-use, restore or rehabilitate disturbed peat will be included.
- Quantities of acrotelmic, catotelmic and amorphous peat potentially disturbed by each part of the Development.
- Management of peat during construction (e.g., temporary storage locations and measures).

10.6.23 If peat is present on the site, a Peat Landslide Risk Assessment will also be undertaken in accordance with Scottish Government guidance document "Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Developments" (2017).

10.6.24 This approach is in accordance with published best practice guidance and the Welsh Government Environment Bill (2015) with regard to the protection of natural resources and The Well-being of Future Generations (Wales) Act (2015) with regard to sustainable development and can help support Welsh Government policy relating to peat including supporting improvements to peatland ecosystem resilience.

10.6.25 The magnitude / consequence of the loss or damage to soil and peat resources is based upon the:

- Likely nature and scale of soils effects (positive, neutral or negative) during the construction and the operational phases of the project.
- Likelihood of the Development to result in significant effects.
- Issues requiring further assessment and the methods to be applied.

10.6.26 The approach to assigning levels of sensitivity to geology and soils will be based on the Design Manual for Roads and Bridges (DMRB) LA 109 guidance, as summarised in Table 10.8.

10.6.27 Peat is not referred to specifically in the DMRB guidance and Table 10.8, therefore, includes additional description for peat soils (shown in italics) that will be used in the assessment for the Development. The sensitivity of the soil on the Site will be assigned on the basis of the findings of the Phase 1 peat survey and other relevant survey or desk-based information. The classifications in Table 10.8 are intended to reflect the importance of peat soils in relation to their soil organic matter content and climate change resilience and mitigation, and biodiversity and flood management functions, and the Welsh Government's Peatland Policy.

Table 10-8: Sensitivity classifications for soils

Value / Sensitivity	Description Example
Very high	Soils: soils *(other than peat)* directly supporting an EU designated site (e.g. SAC, SPA, Ramsar) *designated peatlands (any statutory designation including SSSI)*

Value / Sensitivity	Description Example
High	Soils: soils *(other than peat)* directly supporting a UK designated site (e.g. SSSI) *peat: deep peat with no designation*
Medium	Soils: Soils *(other than peat)* supporting non-statutory designated sites (e.g. Local Nature Reserves (LNR), LGS's, Sites of Nature Conservation Importance (SNCIs)) *peat: peaty soils*
Low	Soils: soils *(other than peat)* supporting non-designated notable or priority habitats
Very Low	Soils: soils *(other than peat)* on previously developed land formerly in 'hard uses' with little potential to return to agriculture

10.6.28 The approach to assigning the consequence of any damage or loss will be based on the DMRB LA 109 guidance summarised in Table 10.9.

Table 10-9: Magnitude classifications for soils and geology

Magnitude	Description Example
Major	Soils: physical removal or permanent sealing of soil resource.
Moderate	Soils: permanent loss / reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource.
Minor	Soils: temporary loss / reduction of one or more soil function(s) and restriction to current or approved future use (e.g. through degradation, compaction, erosion of soil resource.)
Negligible	Soils: no discernible loss / reduction of soil function(s) that restrict current or approved future use.
No change	Soils: no loss / reduction of soil function(s) that restrict current or approved future use.

10.6.29 The determination of significance will combine the sensitivity and magnitude using the matrix presented in Table 10.10. Where professional judgement is applied in assigning a sensitivity or magnitude (e.g., in relation to peat, which is not referred to directly in the DMRB LA 109 guidance), this will be clearly defined, and the resulting assessment conclusions clarified in the EIA reports.

Table 10-10: Soil effects significance evaluation matrix

	Magnitude of change				
	No change	**Negligible**	**Minor**	**Moderate**	**Major**

Sensitivity/importance/value						
	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Note: Significant effects are those identified as 'Very large' or 'large'. 'Moderate' effects have the potential to be significant, and indeed they would normally be deemed to be significant. However, there may be some exceptions, depending on the environmental topic and the application of professional judgment.

Hydrogeology Approach

10.6.30 The significance of an effect resulting from the Development is primarily determined by the value of a given water feature and the magnitude of the effect. In terms of hydrogeology, the key determinants of magnitude relate to water quality, and to some extent quantity and flow.

10.6.31 Table 9.5 details the basis for assessing receptor sensitivity. The value of groundwater features is normally related to the importance of the feature that might be at risk from effects. The criteria used by Wood in the assessment of water feature value are semi-quantitative, so some professional judgement by the assessor has been required.

Table 10-11: Establishing the sensitivity of hydrogeology receptors

Sensitivity	**Criteria**	**Receptor type***	**Examples**
High	Features with a high yield, quality or rarity with little potential for substitution.	Aquatic environment	Conditions supporting a site with an international conservation designation (Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar site), where the designation is based specifically on aquatic features.
	Water use supporting human health and economic activity at a regional scale.	Water use	Regionally important public groundwater supply (and associated catchment/GWMU) or permitted discharge.
Medium	Features with a medium yield, quality or rarity, with a	Aquatic environment	Conditions supporting a site with a national conservation designation (e.g. SSSI, National

Sensitivity	Criteria	Receptor type*	Examples
	limited potential for substitution.		Nature Reserve (NNR)), where the designation is based specifically on aquatic features. WFD groundwater body (or part thereof) with overall 'Good' status.
	Medium quality watercourse morphology	Watercourse morphology	A watercourse in natural equilibrium and exhibiting a natural range of fluvial processes and morphological features, with little or no modification or anthropogenic influence.
	Water use supporting human health and economic activity at a local scale.	Water use	Local public groundwater supply (and associated catchment/GWMU) or permitted discharge. Licensed non-public groundwater supply abstraction (and associated groundwater catchment) which is relatively large relative to available resource, or where raw water quality is a critical issue, e.g. industrial process water, or permitted discharge.
Low	Features with a low yield, quality or rarity, with some potential for substitution.	Aquatic environment	Conditions supporting a site with a local conservation designation (e.g. Local Nature Reserve (LNR), County Wildlife Site (CWS)), where the designation is based specifically on aquatic features, or an undesignated but highly/moderately water-dependent ecosystem, including a Local Wildlife Site (LWS) and a GWDTE. Groundwater body (or part thereof) with overall Poor status.
	Water use supporting human health and economic activity at household/individual business scale.	Water use	Licensed non-public groundwater supply abstraction (and associated catchment/GWMU), which is relatively small relative to available resource, or where raw water quality is not critical, e.g. cooling water,

Sensitivity	Criteria	Receptor type*	Examples
			spray irrigation, mineral washing or permitted discharge. Unlicensed potable groundwater abstraction (and associated catchment) e.g. private domestic water supply, well, spring or permitted discharge.
Very Low	Commonplace features with very low yield or quality with good potential for substitution.	Aquatic environment	Conditions supporting an undesignated and low water-dependent ecosystem, including a LWS, GWDTE and pond. Non-reportable WFD groundwater body (or part thereof), or non-WFD groundwater body.
	Water use does not support human health, and of only limited economic benefit.	Water use	Unlicensed non-potable groundwater abstraction (and associated catchment) e.g. livestock supply.

*Receptor types map onto receptor lists as follows:

Aquatic environment –, aquifers/WFD groundwater bodies, conditions supporting GWDTEs and designated conservation sites

Water use – springs, abstractions

10.6.32 Table 10.12 details the basis for assessing magnitude of change. The magnitude of change on water receptors is independent of the value of the receptor, and its assessment is semi-quantitative, based professional judgement.

Table 10-12: Establishing the magnitude of change

Magnitude	Criteria	Receptor type	Example
High	Results in major change to feature, of sufficient magnitude to affect its use/integrity.	Aquatic environment	Deterioration in groundwater levels, flows or water quality, leading to non-temporary downgrading of status of WFD groundwater body or dependent receptors, or the inability of the groundwater body to attain Good status in line with the measures identified in the RBMP.

Magnitude	Criteria	Receptor type	Example
		Water use	Complete or severely reduced water availability and/or quality, compromising the ability of water users to abstract.
Medium	Results in noticeable change to feature, of sufficient magnitude to affect its use/integrity in some circumstances.	Aquatic environment	Deterioration in groundwater levels, flows or water quality, leading to potential temporary downgrading of status of WFD groundwater body or dependent receptors, although not affecting the ability of the groundwater body to achieve future WFD objectives.
		Water use	Moderate reduction in water availability and/or quality, which may compromise the ability of the water user to abstract on a temporary basis or for limited periods, with no longer-term impact on the purpose for which the water is used.
Low	Results in minor change to feature, with insufficient magnitude to affect its use/integrity in most circumstances.	Aquatic environment	Slight deterioration in groundwater levels, flows or water quality, but with no short-term or permanent downgrading of status of WFD groundwater body or dependent receptors.
		Water use	Minor reduction in water availability and/or quality, but unlikely to affect the ability of a water user to abstract.
Very Low	Results in little or no change to feature, with insufficient magnitude to affect its use/integrity	Aquatic environment	No or very slight change in groundwater levels or groundwater quality, and no consequences in terms of status of WFD groundwater body or dependent receptors.
		Water use	No, or very slight change in water availability or quality and no change in ability of the water user to exercise licenced rights or continue with small private abstraction.

Significance Evaluation Methodology

10.6.33 The significance of water-related effects is derived by considering both the value of the feature and the magnitude of change. In this assessment, effects are assessed to be significant or not significant according to the matrix in Table 10.13, with 'Major' and 'Moderate' effects taken to be 'Significant'. Significance can be 'Beneficial', 'Adverse' or 'Neutral'.

Table 10-13: Significance evaluation matrix relating to hydrogeology

		Magnitude of change			
		High	**Medium**	**Low**	**Very Low**
Value/importance/value	**High**	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Note: 'Significant' effects are those identified as 'Major'. 'Moderate' effects would normally be deemed to be 'significant'. However, there may be some exceptions, depending on the application of professional judgment.

10.6.34 In this assessment, only the potential and residual significance of change with respect to the water environment (groundwater levels, flows and quality) are assessed. It is important to recognise that a 'Significant' change in the water environment does not necessarily result in a 'Significant' change to ecological features. Indeed, because of the different benchmarks and magnitude criteria used by the two assessments, it is possible that a 'Not Significant' change in the water environment can still sit alongside a 'Significant' change in an associated ecological water feature, and vice-versa.

10.7 ASSUMPTIONS

The scope of the assessment is based on a high-level review of available desk-based information and will be confirmed through further desk-based review and surveys, including a geo-environmental desk study and a mining risk assessment.

10.8 QUESTIONS FOR CONSULTEES

Question 10.1	Is there any other baseline information on the hydrogeology, geology and ground conditions that should be assessed?

Question 10.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the hydrogeology, geology and ground conditions receptors?
Question 10.3:	Have all relevant potential impacts on hydrogeology, geology and ground conditions been identified that might arise from the Development?
Question 10.4	Do you agree with the hydrogeology, geology and ground conditions impacts that have been scoped in and out of the assessment, together with the reasons for doing so?
Question 10.5	Are the embedded mitigation measures sufficient to avoid the significant impacts identified?

11 TRANSPORT, MOVEMENT & ACCESS

11.1 INTRODUCTION

11.1.1 This chapter sets out the proposed scope of the Transport, Movement and Access assessment, which will assess the impact of the various different stages of the Development on the existing road network in the area. Reference will also be made to applicable policies, guidance and strategies.

11.1.2 The study area for the Transport, Movement and Access assessment will include all transport routes associated with the Development and will assess the impact of the construction, operational and decommissioning phases on the transport haulage routes.

11.2 RELEVANT LAW, POLICY & GUIDANCE

11.2.1 This scoping report chapter has been prepared in line with the relevant planning policy documents outlined in Chapter 4: Legal and Policy Context. In particular, attention has been paid to the policy documents listed in Table 11.1.

Table 11-1: Policy and Legislation relevant to Transport, Movement and Access

Legislation/Planning Policy	Description
Legislation	
Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Management and Assessment (IEMA), (1993	The Guidelines sets out the assessment methodology to determine the study area for assessment and the 'rules' to determine this.
Policy	
Future Wales: The National Plan 2040	Future Wales is a plan promoting development that enhances the well-being and quality of life of the people of Wales.
Planning Policy Wales, Edition 11, Welsh Government (2021)	Sets out the land use policies for the Welsh Government.
South East Wales Valleys, Local Transport Plan (2015)	The five South East Wales Valleys local authorities of Blaenau Gwent, Caerphilly, Merthyr Tydfil, Rhondda Cynon Taf and Torfaen jointly developed this Local Transport Plan (LTP). The LTP programme provides details of the transport schemes and aspirations of the SE Wales Valleys local authorities at the current time.
Torfaen LDP & Blaenau Gwent LDP	The LDP identifies where new developments will go. It provides a framework for local decision-making and brings together both development and conservation interests, amongst others, to ensure that any changes in the use of land are coherent and provide maximum benefits to the community.

11.3 BASELINE CONDITIONS

Data Sources

11.3.1 The sources of information used for the Transport, Movement and Access Scoping chapter and the assessment are listed in Table 11.2.

Table 11-2: Sources of information used for the Transport, Movement and Access assessment

Source	Data
Google Earth / Google Maps	Online mapping
Crashmap	Personal Injury Accidents (PIA)
Depart for Transport (DfT)	Traffic Counts (AADT)

Current Baseline

11.3.2 It is anticipated that the Abnormal Indivisible Loads (AILs) [transporting turbine equipment] will travel by road from the Port of Swansea, which is the closest port in the region capable of handling wind turbine equipment. The Port of Swansea has been frequently used for the delivery of wind turbine components in this region, for example being the selected port of entry for the Brechfa Forest Wind Farm, located to the north of Carmarthen.

11.3.3 The sections of the road network included within the assessment will be determined on the basis of the potential effect of increased traffic associated with the Development on identified sensitive receptors.

11.4 SCOPE OF THE ASSESSMENT

Construction

11.4.1 Based on professional experience and an understanding of the nature of the Development, it is expected that the majority of traffic movements will be generated during the construction phase. It is understood the Site will be accessed via an unnamed access track to Mynydd Llanhilleth which routes from Farm Road to the north east of the Site. On this basis, the A472, A4043, B4246 and Farm Road will provide the route between the Strategic (Trunk) Road Network and the Site access track.

Operational

11.4.2 Once operational, it is envisaged that the amount of traffic movements associated with the Development would be minimal. Occasional visits may be made to the Site for maintenance checks. The vehicles used for these site visits are likely to be 4x4 or similar and there may be an occasional need for a heavy goods vehicle (HGV) to access the Site for maintenance and repairs.

11.4.3 It has been assessed that the effects of operational traffic would be negligible and it is therefore proposed that the assessment of the operational phase of the Development is ‘scoped out’ from detailed assessment in the EIA.

Decommissioning

11.4.4 On the assumption that below ground infrastructure and access tracks will remain in situ, less traffic will be generated during decommissioning than during construction. Even if tracks were to be removed, less traffic would be generated during this phase than operation. The traffic baseline is likely to be different (typical trend of annual increases in background traffic) to the current baseline traffic conditions when decommissioning is undertaken after the 30-year operational phase. The effects on the road network are likely to be similar in nature, though of lower magnitude, than that relating to the construction phase as less vehicle movements would be required (for example stone for tracks left in situ or turbine bases left in situ. At the end of the operational period the Development will be decommissioned by removing the turbines and associated electrical equipment. Alternatively, a new application may be made to extend the life or replace the turbines.

11.4.5 When dismantling and removing the turbines the bases would be broken out to below ground levels and all cables cut at depth below ground level and left in the ground. This approach is considered to be less environmentally damaging than seeking to remove foundations and cables entirely. The turbine components themselves will be taken to an appropriate recycling facility where applicable. Due to the timescales it is not possible to identify a specific facility at this time.

11.4.6 Given the above, it is proposed that the assessment of traffic and transport effects during the decommissioning phase of the Development is 'scoped out' from detailed assessment the EIA.

Summary

11.4.7 The main transportation effects will be associated with the movements of commercial HGVs travelling to and from the Site during the construction phase of the Development. This will be subject to detailed assessment in the Environmental Statement.

Potential Receptors

11.4.8 The roads likely to be impacted as a result of traffic movements associated with the Development will be assessed once the final HGV routing is known. Receptors identified along the haul roads will form the scope of the assessment in relation to potentially traffic-related effects. Receptors are users or beneficiaries of highway network assets and facilities, such as pedestrians, cyclists, equestrians and drivers who travel within the vicinity of the Development.

11.4.9 Guidelines for the Environmental Assessment of Road Traffic (GEART) identifies the following groups and special interest groups that may be affected:

- People at home;
- People at work;
- Sensitive groups including children, elderly and disabled;
- Sensitive locations such as hospitals, churches, schools and historical buildings;
- Pedestrians;
- Cyclists;
- Open spaces, recreational and shopping areas;
- Sites of ecological and nature conservation value; and
- Sites of tourist / visitor attractions.

Likely Significant Effects

11.4.10 The likely significant Traffic and Transport effects that will be taken forward for assessment in the Environmental Statement are summarised in Table 11.3.

Table 11-3: Likely Significant Traffic and Transport Effects

Environmental Effect	Description	Receptor
Severance	Separation of people from places and other people or impede pedestrian access to essential facilities.	Pedestrians, cyclists, equestrians.
Driver Delay	Traffic delays to non-development traffic.	Other road users.
Pedestrian Amenity	Effect on the relative pleasantness of a pedestrian journey as a result of changes in traffic flow, traffic	Pedestrians, cyclists, equestrians.

Environmental Effect	Description	Receptor
	composition and pavement width / separation from traffic.	
Pedestrian Delay	Ability of people to cross the road as a result of changes in traffic volume, composition and speed, the level of pedestrian activity, visibility and general physical conditions of the Proposed Development.	Pedestrians, cyclists, equestrians.
Fear and Intimidation	May be experienced by people as a result of an increase in traffic volume and its proximity or lack of protection caused by such factors as narrow pavements widths.	Pedestrians, cyclists, equestrians
Accidents and Safety	Risk of accidents occurring where the Proposed Development is expected to produce a change in the character of traffic.	Other road users, pedestrians, cyclists, equestrians.

Assessment Methodology

11.4.11 The guidance used when assessing the potential significance of road traffic effects is summarised in Guidelines for the Environmental Assessment of Road Traffic (GEART) (IEA, 1993), which states that:

'The detailed assessment of impacts is…likely to concentrate on the period during which the absolute level of an impact is at its peak, as well as the hour at which the greatest level of change is likely to occur.' (Paragraph 3.10).

11.4.12 To assess the impact at its peak, the likely percentage increase in traffic is determined by comparing estimates of traffic generated by the Development with future predicted baseline traffic flows on the roads used by construction traffic in vicinity of the Site.

Determination of Significance

11.4.13 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are 'likely to be significantly affected by the development'.

11.4.14 The EIA Regulations do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

11.4.15 GEART provides two rules that are used to establish whether an environmental assessment of traffic effects should be carried out on receptors:

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

11.4.16 It should be noted that, according to GEART, predicted traffic flow increases below 10% are generally not assessed to be significant as daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flows below this level are, therefore, assumed not to result in significant environmental effects and will therefore not be assessed further as part of this study.

11.4.17 The main transportation impacts associated with a wind farm relate to the construction phase of the development. This would include the movement of HGV traffic travelling to and from a site bringing in material for the construction of the access, tracks, foundations, crane hard standing etc. The assessment will identify the number of HGV movements required for the Development.

11.4.18 Other construction impacts relate to the delivery of the turbine components. These components, by their nature are large and require abnormal load delivery. The assessment will identify the number of abnormal loads required for the Development.

11.4.19 The assessment will include the identification of the baseline data through relevant survey information for all the roads associated with the different elements of the Development. The assessment will identify the:

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

11.4.20 Table 11.4 summarises the rationale used to determine the sensitivity against the corresponding receptors as part of the assessment as contained in GEART. Professional judgement is also used to determine the sensitivity of the receptor.

Table 11-4: Sources of information used for the Transport, Movement and Access assessment

Sensitivity	Description/reason	Receptor
High	Receptors of greatest sensitivity to traffic flows: schools, colleges, playgrounds, accident blackspots, retirement homes and urban/residential homes without footways that are used by pedestrians and cyclists.	Residents/workers travelling to and from work or home on foot and by bicycle, school children, leisure walkers and equestrians.
Medium	Traffic flow sensitive receptors including congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycle ways, community centres, parks, recreation facilities.	Residents/workers travelling to and from work or home on foot and by bicycle, people visiting these land uses
Low	Receptors with some sensitivity to traffic flows: places of worship, public open space, nature conservation areas, listed buildings, tourist/visitor attractions and residential areas with adequate footway	Residents/workers travelling to and from work or home on foot or bicycle and people visiting these land uses

	provision.	
Negligible	Receptors with low sensitivity to traffic flows: Motorway and Dual Carriageways and/or land uses sufficiently distant from affected routes and junctions.	Residents/workers travelling by foot or by bicycle.

11.4.21 The sensitivity of each highway link included in the assessment will be assigned a sensitivity in accordance with GEART. This is based on the proximity of sensitive receptors to the highway link and the highway environment. Sensitivity judged as High or Medium results in Rule 2 (sensitive areas where traffic flows are predicted to increase by 10% or more) being considered. Sensitivity judged as Low or Negligible results in Rule 1 being considered (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%)).

11.4.22 The classification of a likely traffic and transport effect will then be derived by assessing the sensitivity of the receptor against the magnitude of change, with the details of the assessment presented in the Environmental Statement.

11.4.23 Table 11.5 provides a summary of the magnitude of change for each transport effect, with the thresholds used to determine this being based on guidance within GEART.

Table 11-5: Magnitude of Change Summary

Transport Effect	**Magnitude of Change**			
	Major	**Moderate**	**Minor**	**Negligible**
Severance	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%
Driver Delay	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%
Pedestrian Amenity and Delay	Change in total traffic or HGV flows over 91%	Change in total traffic or HGV flows of 61-90%	Change in total traffic or HGV flows of 31-60%	Change in total traffic or HGV flows of less than 30%
Accidents and Safety	Informed by a review of existing collision patterns and trends based upon the existing personal injury accident records and the forecast increase in traffic.			

11.4.24 The classification of a likely traffic and transport effect is derived by assessing the sensitivity of the receptor (derived from Table 11.4) against the magnitude of change (derived from Table 11.5) as defined in Table 11.6 below. The shading indicates those significance ratings that are deemed to be 'significant' effects.

Table 11-6: Significance Criteria

		Magnitude of change			
		Major	**Moderate**	**Minor**	**Negligible**
Sensitivity	**High**	Major	Major / Moderate	Moderate	Minor / Negligible
	Medium	Major / Moderate	Moderate	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor / Negligible	Negligible	Negligible	Negligible

11.4.25 Major, Major/Moderate and Moderate effects (shaded in table above) are assessed to be significant in terms of the EIA regulations, whilst Minor, Minor/Negligible and Negligible effects are assessed to be neutral/not significant.

11.4.26 Assessment will also be given as to whether any of the receptors which would be taken forward for assessment are likely to be subject to cumulative effects because of the Transport, Movement and Access effects generated by other proposed developments. Where this is likely to be the case a cumulative assessment would be undertaken.

11.5 ASSUMPTIONS

11.5.1 The scope of the assessment is based on a desk-based review of currently available information and will be confirmed through review of additional data sources, site visit and consultation with stakeholders during the next stages of the EIA.

11.5.2 For the purposes of this scoping assessment it has been assumed that turbine equipment would be delivered from the Port of Swansea and that below ground infrastructure would remain in situ post-operation.

11.6 QUESTIONS FOR CONSULTEES

11.6.1 Blaenau Gwent CBC, Torfaen CBC, Traffic Wales and other relevant consultees in relation to transport/access are asked to the consider the following questions:

Question 11.1	Is there any other baseline information in relation traffic or the highway network that should be considered?
Question 11.2	Are there any committed developments or highway schemes that may affect the future baseline?
Question 11.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the potential receptors?

Question 11.2	Have all relevant potential impacts been identified that might arise from the Development?
Question 11.2	Do you agree with the transport impacts that have been scoped in and out of the assessment, together with the reasons for doing so?

12 NOISE & VIBRATION

12.1 INTRODUCTION

12.1.1 This chapter sets out the proposed approach to the assessment of potential noise and vibration effects associated with the construction and operation of the Development.

12.2 RELEVANT LAW, POLICY & GUIDANCE

12.2.1 Table 12.1 outlines the legislation, policy and guidance relevant to noise for the Development. The table also provides a comment on the implication of the legislation, policy and guidance with respect to the scope of the EIA.

Table 12-1. Relevant legislation, policy and guidance

Legislation, policy, guidance	Implication on assessment
National Policy Statement	NPS EN-1 advises that applicants include a noise assessment to consider both construction and operation effects where appropriate. EN-3 at 2.7.56 states that the applicant's assessment of noise from the operation of the wind turbines should use ETSU-R-97, taking account of the latest industry good practice.
Welsh Assembly Government: Technical Advice Note (TAN) 8: Renewable Energy (2005)	TAN 8 provides general guidance and advice on the role of the planning system in helping to prevent and limit the adverse effects of noise. In addition, it cites ETSU-R-97 as guidance which offers a reasonable degree of protection to wind farm neighbours, without placing unreasonable restrictions on wind farm development.
Welsh Assembly Government: Technical Advice Note (TAN) 11: Noise (2007)	TAN 11 provides general advice on noise and refers to TAN 8 for guidance regarding noise from wind turbines and wind farms.
ETSU-R-97, 'The Assessment and Rating of Noise from Wind Farms', The Working Group on Noise from Wind Turbines	Information and advice to developers and planners on the environmental assessment of noise from wind turbines. The guidance offers a framework for the measurement of wind farm noise and gives indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours.
The Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (2013)	Presents current good practice in the application of ETSU-R-97 for all wind turbine developments above 50kW. The good practice guide gives information to assist consultants, developers and local planning authorities in using the correct technical and procedural methods for the assessment and determination of wind farm applications, reflecting the original principles within ETSU-R-97 and the

Legislation, policy, guidance	Implication on assessment
	results of research carried out and experience gained since its publication.
BS5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites - Part 1: Noise'	Detailed guidance on assessing noise from construction sites.
Environmental Protection Act 1990, Part III – as amended by the Noise and Statutory Nuisance Act 1993	An Act to make provision for the improved control of pollution arising from certain industrial and other processes, including noise pollution.
Control of Pollution Act 1974	An Act to make further provision with respect to waste disposal, water pollution, noise, atmospheric pollution and public health; and for the purposes connected with the matters previously mentioned.

12.3 BASELINE CONDITIONS & MAIN ISSUES

Data Sources

12.3.1 The primary data source used to inform this chapter is aerial imagery from Google Earth Pro Version 7.3.3.7699, 2020, which was used in combination with the preliminary layout for the Development.

Study Area

12.3.2 The defined study area for scoping is based on a radius of 10km from the Development.

12.3.3 Within the 10 km study area, other wind farm developments (including those that are consented but not built or at planning stage) would be considered during the EIA process as part of the assessment of cumulative effects. It will be assessed whether these other wind farms would have a significant contributory effect on noise levels at residential receptors most affected by the Development.

Current Baseline

12.3.4 The Site is located in a rural area with the most notable noise sources to be traffic on the A467 approximately 2km from the centre of the Site. There has been no recent surveys undertaken to quantify baseline conditions. If required as a result of the initial screening assessment (paragraph 1.22), a programme of baseline measurements will be taken to inform the EIA, as outlined in section 1.14.

12.3.5 Review of the Site has identified four potential representative sensitive receptors that would be considered for the EIA:

- Properties furthest east in the village of Llanhilleth (located southwest of the Site boundary);
- Isolated properties off Blaen Y-cwm Road (located south of the Site boundary);
- Properties furthest west in the village of Pontnewynydd (located east of the Site boundary); and,
- Isolated properties in St Illtyd (located north of the Site boundary).

12.3.6 These locations would be considered for noise monitoring if required.

Future Baseline

12.3.7 It is unlikely that the current noise climate will change in areas surrounding the Site from noise sources other than wind turbine noise. It is however possible that noise from windfarms close to the

Site (either consented or currently in planning) may potentially contribute to the acoustic baseline. A cumulative assessment will be undertaken as part of the assessment and this will include windfarms currently consented or within planning.

12.4 ASSESSMENT METHODOLOGY

Construction Noise

12.4.1 In order to undertake construction noise calculations, details of the construction programme, phasing of the works and types and numbers of plant are required. Such data would only become available once the contract(s) to construct the Development have been finalised. Notwithstanding the above, should impact piling be potentially used on Site, a worst-case scenario for construction noise assessment, based upon experience of similar projects, will be presented in the ES. Construction noise from piling would be predicted and assessed in accordance with 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1 – Noise. Similarly, any blasting requirements would unlikely be known at the stage of submission and would be considered qualitatively, controlled via a blasting management plan as part of a planning condition requirement.

12.4.2 The impact of construction traffic along the local road system would be predicted using Calculation of Road Traffic Noise (1988) and assessed using the magnitude criteria within the Design Manual for Roads and Bridges (2020). The impact of construction traffic along the Site access route and the interim access track would be predicted and assessed in accordance with 5228-1:2009 + A1:2014.

12.4.3 In most cases, construction noise (including construction traffic) is controlled through the implementation of mitigation measures (such as limiting hours during which construction can be undertaken) and undertaking construction works in accordance with good practices as described in BS 5228-1:2009 + A1:2014 (such as using well maintained and serviced plant, and the appointment of a Site contact to whom complaints/queries can be directed).

Operational Noise

12.4.4 Aerodynamic noise occurs from the movement of the wind turbine blades passing through the air. At higher wind speeds, aerodynamic noise is usually masked by the increasing sound of wind blowing through trees and around buildings. The level of masking determines the perceived audibility of the wind farm. The proposed impact assessment establishes the relationship between wind turbine noise and the natural masking of noise resulting from features of the surrounding environment and assesses noise levels against established standards.

12.4.5 The proposed operational noise assessment would be undertaken in accordance with 'ETSU-R-97: The Assessment and Rating of Noise from Wind Farms', (ETSU-R-97 Guidance) (1996), and the assessment methodology advocated within the Institute of Acoustics 'A Good Practice Guide to Applications of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' (IoA GPG) (2013).

12.4.6 The ETSU Guidance advises that any noise restrictions placed on a wind farm must balance its environmental impact against the national and global benefits that would arise through the development of renewable energy sources:

"The planning system must therefore seek to control the environmental impacts from a wind farm whilst at the same time recognising the national and global benefits that would arise through the

development of renewable energy sources and not be so severe that wind farm development is unduly stifled."

12.4.7 If the screening described in paragraph 1.22 identifies a need for a full ETSU-R-97 assessment, an understanding of the change in background noise levels with wind speed at receptors is required to provide the necessary criteria. This is achieved by monitoring background noise levels at sensitive receptors and simultaneously measuring the variation in wind speed and direction at the wind farm site, using either a >50m met mast with anemometers at dual heights, or by a LiDAR or SoDAR system. Noise and wind speed measurements are taken as a series of simultaneous ten-minute averaged measurements, over a period of at least two weeks. From this data, regression analysis is performed to determine typical background noise levels for each receptor across a range of wind speeds (4 m/s – 12 m/s).

12.4.8 Noise limits are defined separately for daytime (07:00 – 23:00) and night-time (23:00 – 07:00) based on background data for the receptors[26] as follows:

- 5 dB above the background noise curve for wind speeds up to 12 m/s; or
- a fixed lower limit of 35 dB $L_{A90,\ 10\ min}$, whichever is higher.

12.4.9 For the cumulative assessment, it is considered that using the fixed lower limit of 40 dB as allowed for in ETSU-R-97 is appropriate. For properties with a financial interest in the scheme, the lower limit is fixed at 45 dB.

12.4.10 Noise modelling would be undertaken using software adopting methodologies advocated by the Institute of Acoustics Good Practice Guide (2014). The assessment will take into account wind shear and where required tonality. Low frequency noise and amplitude modulation would be beyond the scope of the assessment and should be considered during operational in the event of complaints. A cumulative noise assessment will be included within the EIA. This assessment will identify other wind turbine development (operational, consented or subject to an application) in the area that may impact on sensitive receptors together with the Development. A cut-off date for the assessment will be identified in the EIA Report and a list of wind turbine developments identified for the cumulative assessment will be created.

12.4.11 For the purposes of the assessment, the determination of effect significance for the operational phase of the Development is based upon compliance with the applicable noise limit i.e. a breach of noise limits indicates a significant effect, whereas compliance with noise limits indicates an effect which is not significant.

12.4.12 As noise levels exceeding the ETSU Guidance noise limits are deemed to be significant, they would require further consideration were this the case; with a view to identifying appropriate mitigation to ensure compliance with the specified limits. These may include adoption of quieter turbines; reducing the power rating, and thus the noise emission of particular turbines in particular wind

[26] Daytime levels based on quiet daytime periods (18:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays),

environments; or design of a noise management plan which varies the operation of the wind turbines dependent on the existing wind direction.

12.5 POTENTIAL SIGNIFICANT EFFECTS OF THE DEVELOPMENT

12.5.1 The likely significant noise effects that will be taken forward for assessment in the Environmental Statement are summarised in Table 12.2. The scoping in of a full operational noise assessment will be dependent on an initial screening assessment based on exceedances of the 35 dB L_{A90} daytime limit of ETSU-R-97 at 10 m/s wind speed. If a full noise assessment is not deemed to be required, the screening assessment will be included within the ES.

Table 12-2 Potential significant effects for different noise sources

Activity	Effect	Receptor
Impact pilling (if required as part of the construction of the development)	Noise disturbance to receptors in the area of activities	Nearest noise sensitive receptors to the site boundary
Construction traffic movements	Disturbances to receptors to the construction traffic route	Nearest noise sensitive receptors along construction traffic route
Operational turbine noise	Noise disturbance from wind turbines	Nearest noise sensitive receptors to the site boundary

12.5.2 The effects scoped out from the further assessment in the Environmental Statement are:

- Blasting would be very unlikely, however, if any blasting is to occur it would be controlled via a blasting management plan as part of a planning condition requirement.
- Noise emissions from construction activities other than piling and traffic (noise from haul route use on-site would be scoped out) are unlikely to be sufficiently high, given the distance of the Development to Noise Sensitive Receptors, to warrant a noise assessment. However, planning conditions regarding standard times of work should apply.
- Operational traffic noise during the operation of the Development is scoped out as the amount of traffic associated with development operation would be minimal.
- Vibration associated with on-site construction noise and construction traffic.
- Vibration effects during operation.
- The effects of decommissioning on any Noise Sensitive Receptors are likely to be similar in nature but of lower magnitude than those during the construction phase. As a result, it is not proposed to assess the decommissioning phase of the development in addition to that of the construction phase.

12.6 APPROACH TO MITIGATION

12.6.1 Mitigation of 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 noise sensitive receptors with commercially available wind turbines, taking into account the noise emissions from cumulative wind farms in the area.

12.6.2 Construction noise and construction traffic will be managed through ‘best practical measures’ which will be set out in the environmental statement.

12.7 QUESTIONS FOR CONSULTEES

Question 12.1	Do the consultees agree with the suggested approach for the noise assessment?
Question 12.2	Do the relevant Local Authorities agree with the noise topics proposed to be scoped out of the EIA?

13 OTHER EIA TOPICS

Introduction

This chapter of the Scoping Report reviews other topics to be included within the proposed ES.

13.1 SOCIO-ECONOMIC EFFECTS

Introduction

13.1.1 Wind farm developments can deliver a number of direct and indirect economic effects as a result of matters such as change of land use, provision of employment and associated income, use of hospitality services by workers during construction, changes to recreational activity, and the potential for community or shared ownership.

13.1.2 Studies and surveys have been undertaken looking specifically at the impacts of wind farms on tourism, including research by the Welsh Government in 2014[27] which found there is little evidence that wind farms have had or are having a negative effect on tourism across Wales and the UK as a whole. A recent UK wide Energy and Climate Change Public Attitudes Tracker (PAT) found that 82% of respondents supported renewable energy (an increase form 77% in the previous PAT). 74% of respondents supported onshore wind, opposition to renewables was very low at 3%. Overall, the existing literature does not support the proposition that wind farms may have significant negative effects on tourism, but instead suggests there is potential for some positive effects (Whitelee Wind Farm near Glasgow is a good example).

13.1.3 However, due to the scale of the Development, such positive effects that may occur will not be expected to be significant according to the EIA Regulations. No significant effects on tourism (either positive or negative) are therefore expected in relation to the proposals and it is proposed to scope out tourism from the EIA and ES. This approach has been previously accepted by Welsh Ministers (in relation to Alwen Forest Wind Farm) and has been relatively common practice in the past for other socio-economic effects of wind farms to be considered within the EIA process and reported on in the wind farm ES. However, the outcome of these assessments is routinely that such effects as will occur fall below the threshold of significance according to the EIA regulations. Therefore, in the interests of focussing Mynydd Llanhilleth's ES on likely significant effects, it is therefore proposed to scope out all socio-economic effects from the ES. Instead, a standalone statement (appended to the Planning Statement) will be submitted as part of the DNS application.

Land Use

13.1.4 The potential effects of the Development on Mynydd Llanhilleth Common will be addressed in the ES. The ES will provide a summary of the Development's effect on current farming practices and

27 Welsh Government (2014) Study into the Potential Economic Impact of Wind Farms and Associated Grid Infrastructure on the Welsh Tourism Sector, https://gov.wales/docs/desh/publications/w40404economic-impacts-of-wind-farms-on-tourism-en.pdf

land use. More detail on the potential effects and mitigation will be provided within a 'Supporting Statement' that will accompany the Commons Application.

13.2 TELECOMMUNICATIONS & UTILITIES

13.2.1 The ES will consider the potential effects of the Development on existing infrastructure, television, aviation, and radar and radio-communication signals.

13.2.2 During the preparation of the ES relevant consultees and infrastructure operators will be identified. Their responses will be collated and reported to the design team. Should infrastructural constraints be identified, revision to the turbine layout may be necessary to avoid electronic interference or disruption to services. Technical solutions to any infrastructural constraint will be sought during this process to minimise effects upon it.

13.3 HUMAN HEALTH

13.3.1 The potential effects on population and human health arising from the Development would be considered in the context of the other factors identified in Schedule 4(2) of the 2017 EIA Regulations given that any environmentally related health issues (both beneficial and adverse) are likely to result from, for example, exposure to traffic, changes in living conditions resulting from noise, and increased employment opportunities. It is therefore proposed that population and human health effects of the Development are incorporated within the relevant technical chapters such as traffic and transport, noise, shadow flicker and landscape & visual (in respect of residential amenity in particular).

13.4 SHADOW FLICKER

13.4.1 Shadow Flicker is a phenomenon that can occur in sunny weather when turbines are operating and the rotating blades cause a flickering effect inside a building where sunlight passes through an opening such as a window or door.

13.4.2 For shadow flicker to occur, the receptor must be directly in line with the wind turbines when the sun is low in the sky and within 10 rotor diameters of a turbine where they are located within 130 degrees either side or north of any turbine. In these circumstances, the moving turbine blade briefly blocks / reduces the intensity of light entering an opening to a room on each rotation, causing a flickering to be perceived.

13.4.3 If, after design development, any properties were to be located within a 130 degree segment either side or due north, relative to the turbines and within ten rotor diameters of a turbine (as per guidance) they will be assessed for shadow flicker.

13.4.4 Where properties meet both criteria for there to be a potential shadow flicker effect, the seasonal duration of this effect will be calculated from the geometry of the turbine and the latitude of the Development, to assess potential impacts upon the amenity of local residents. Mitigation measures will be proposed in the ES should they be necessary.

13.5 CLIMATE CHANGE

Introduction

13.5.1 The Environment (Wales) Act 2016 set a legal target of reducing greenhouse gas emissions by at least 80% by 2050, including a series of interim targets (for 2020, 2030 and 204) and associated carbon budgets for key sectors. The Climate Change (Carbon Budgets) (Wales) Regulations 2018

set a carbon budget for the 2016 to 2022 budgetary period limited to emissions an average of 23% lower than the baseline, and a carbon budget for the 2021 to 2025 budgetary period with emissions limited to an average of 33% lower than the baseline. To support the first carbon budget, the WG published its emissions reduction delivery plan for its first carbon budget period (2016-2020) - 'Prosperity for All; a Low Carbon Wales (2019) looks at emissions reducing pathways, policies and proposals across a broad range of sectors.

13.5.2 In December 2015, 196 countries including the UK adopted the Paris Agreement, a legally binding international treaty on climate change[28]. The treaty aims to limit global warming to well below 2 degrees Celsius (°C), preferably to 1.5°C, compared to pre-industrial levels, through reductions in greenhouse gas (GHG) emissions. The Paris Agreement was ratified in November 2016, with countries having to submit their climate action plans, known as nationally determined contributions (NDCs), by 2020. The UK's NDC commits to a 68% reduction in economy-wide greenhouse gas emissions by 2030, compared to 1990 levels[29].

13.5.3 Following the UKs commitment to the Paris Agreement, the CCC recommended a 95% reduction by 2050 target for Wales. The WG intended to legislate on this basis while setting out a bigger ambition to reach net zero by 2050. The WGs declaration of a climate emergency in 2019 and the goal under the Wellbeing of Future Generations Act for a globally responsible Wales provided the context for a review of the targets, which aligned with the principle of progression enshrined in the Paris Agreement Updated advice from the CCC outlined a pathway for Wales to meet a net zero target by 2050. The Climate Change (Carbon Budgets) (Wales) (Amendment) Regulations 2021 has revised the carbon budgets to require a 63% reduction by 2030; 89% reduction by 2040 and at least a 100% reduction, or net zero, by 2050. An updated emissions plan is due in summer 2021.

13.5.4 The Environment (Wales) Act 2016, (Amendment of 2050 Emissions Target) Regulations 2021, has committed the country to net zero emissions by 2050[30,31]. As part of the Act, the Welsh Ministers must set successive five-year carbon budgets ('the Welsh carbon budgets'). These budgets are considered as part of setting the UK Carbon Budgets which have been set up to 2037.

[28] UNFCCC (2016). The Paris Agreement. [online] UNFCCC. Available at: https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement [Accessed 21 Apr. 2021].
[29] The UK Government (2020). The UK's Nationally Determined Contribution under the Paris Agreement. [online] GOV.UK. Available at: https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc [Accessed 21 Apr. 2021].
[30] Legislation.gov.uk. (2016). Environment (Wales) Act 2016. [online] Available at: https://www.legislation.gov.uk/anaw/2016/3/introduction [Accessed 21 Apr. 2021].
[31] The UK Government. (2021). The Environment (Wales) Act 2016 (Amendment of 2050 Emissions Target) Regulations 2021. [online] Available at: https://www.legislation.gov.uk/wsi/2021/333/introduction/made [Accessed 21 Apr. 2021].

13.5.5 In its 2018 *'Energy Generation in Wales report'*, the Welsh government announced a target of meeting 70% of Wales' electricity demand from Welsh renewable electricity sources by 2030[32]. In 2018, already 50% of electricity consumption in Wales was from renewables[5].

13.5.6 Further, as part of Wales' *'Town and Country Planning Environmental Impact Assessment'*, developers must provide a description of the likely significant effects of a development on the environment[33]. This includes the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. This scoping report, in accordance with regulations and IEMA guidance, will fulfil both requirements under its '*Vulnerability to Climate Change'* and '*Carbon Balance Assessment'* sections[34,35].

Vulnerability to Climate Change

13.5.7 Climate change and environmental specialists will collaborate to address potential climate change impacts where necessary, basing assessment on climate projections, best practice and expert judgement. This ensures the design of the Development is in-line with local, regional and national policies regarding adaptation to climate change. The climatic conditions at the end of the design life of the Development will be assessed.

13.5.8 Within the ES and in the further documentation supplied for planning purposes (e.g., the Design and Access Statement), relevant chapters (such as flood risk, ecology and ornithology) will incorporate climate mitigation measures in the design and assessment. Therefore, as vulnerability to climate change and extreme climate events will be assessed within the engineering design and Environmental Assessment, it is not proposed that a separate ES assessment is required. Vulnerability to Climate Change will therefore not be assessed as its own chapter.

Carbon Balance Assessment

13.5.9 GHG emissions are used as a measure and indicator of the Development's impact on climate. Increasing concentrations of GHG emissions in the atmosphere results in changes to climatic conditions and create climate change impacts. Any GHG emissions arising as a result of the Development will therefore have an impact on climate change. As such, in accordance with IEMA guidance[7] and with Welsh EIA regulations, a Carbon Balance Assessment will be produced and reported in an appendix of the ES.

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[32] Energy Generation in Wales 2018. (2018). [online] . Available at: https://gov.wales/sites/default/files/publications/2019-10/energy-generation-in-wales-2018.pdf [Accessed 21 Apr. 2021].

[33] The UK Government. (2017). *The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017*. [online] Available at: https://www.legislation.gov.uk/wsi/2017/567/contents/made [Accessed 21 Apr. 2021].

[34] IEMA (2017). *Assessing Greenhouse Gas Emissions and Evaluating their Significance Environmental Impact Assessment Guide to*. [online] . Available at: https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance [Accessed 21 Apr. 2021].

[35] IEMA (2017). *Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation*.

13.5.10 The Carbon Balance Assessment will include a lifecycle approach assessment as part of quantifying the net carbon impact of the Development. GHG emissions from the production, transportation, erection, operation and decommissioning phases of the Development, will be calculated and will be reflected in the assessment of the carbon payback period. Should loss of peat land occur, or should construction on deep peat sites (those greater than 0.5m) be unavoidable, related emissions will be included in the assessment of the carbon payback period. This topic is covered in Chapter 10 of this report.

13.5.11 The assessment will include the use of an appropriate, industry recognised tool to determine the net carbon impact of the Development. The Scottish Government has developed a calculator for use in the assessment of carbon savings from wind farm developments on peatlands[36]. As a Welsh equivalent does not yet exist, this tool will likely be used.

13.5.12 The annual energy generation of the Development will be calculated using a high-level approach supported by Renewables UK[37], incorporating installed capacity, an appropriate load factor and an availability factor. This will subsequently be assessed against the potential carbon saving relative to electricity generation based on the existing UK energy-grid mix and contextualised against carbon budgets for Wales and the UK.

13.5.13 Given the inherent carbon benefit of wind farms, a standalone GHG Environmental Statement chapter is not required.

13.6 MAJOR ACCIDENTS & DISASTERS

13.6.1 Paragraph (8) of Schedule 4 of the EIA Regulations states that an ES should describe *"the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned"*.

13.6.2 The scope for the EIA to consider major accidents and disasters has been initially considered in Table 13.1 below. Major accidents or disasters have been scoped in where they represent a risk to the Development, either from the proposed location or from the project itself. A high risk is considered where there is reasonable likelihood of the accident or disaster occurring, or where the effect of the accident or disaster would lead to the need for mitigation which is beyond the usual scope of construction or operational activities. Where an accident or disaster has been scoped in, the ES chapter(s) identified will consider the matter in more detail. This further detail may show that no further assessment is needed, or it may lead onto an appropriate level of assessment and/or identification of appropriate mitigation.

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[36] The Scottish Government. (2018). *Carbon calculator for wind farms on Scottish peatlands: factsheet - gov.scot*. [online] Available at: https://www.gov.scot/publications/carbon-calculator-for-wind-farms-on-scottish-peatlands-factsheet/ [Accessed 21 Apr. 2021].

[37] RenewableUK. (2020). *Statistics Explained - RenewableUK*. [online] Available at: https://www.renewableuk.com/page/UKWEDExplained. [Accessed 21 Apr. 2021].

Table 13-1 Major accidents and disasters

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	Environmental Statement Chapter
Biological hazards: epidemics	Very low	Very low	Out	The probability of epidemics which would affect the construction or operation of the Development is considered to be very low.	N/A
Biological hazards: animal and insect infestation	Very low	Very low	Out	The probability of animal and insect infestations which would affect the construction or operation of the Development is considered to be very low.	N/A
Earthquakes	No	No	Out	Any earthquakes in the vicinity of the Development would be of a very small magnitude and the design of turbine foundations etc. is adequate to withstand such low magnitude events.	N/A
Tsunamis / tidal waves / storm surges	No	No	Out	The general location of the Development and its distance from the coast means there is no risk of these phenomena affecting the Development.	N/A
Volcanic eruptions	No	No	Out	There are no active volcanos in the vicinity of the Development.	N/A

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	Environmental Statement Chapter
Famine / food insecurity	Negligible	Very low	Out	The probability of famine / food insecurity which would affect the construction or operation of the Development is considered to be negligible.	N/A
Displaced populations	Negligible	Very low	Out	The probability of displaced populations affecting the construction or operation of the Development is considered to be negligible.	N/A
Landslide / subsidence	Low	Low	In	The site of the Development is located in an area of previous coal mining. An assessment of potential impacts upon the Development from this previous mining activity, for example from subsidence movements will be undertaken.	Ground Conditions chapter
Severe weather: storms	Medium	No	Out	Turbines are equipped with lightning conductors and automatically shut down when wind speeds are at a level which could damage internal components.	N/A

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	Environmental Statement Chapter
Severe weather: droughts	Very Low	No	Out	The probability of severe drought occurring in the vicinity of the Development is considered to be very low. Furthermore, turbines would be unaffected by drought conditions.	N/A
Severe weather: extreme temperatures	Low	Very Low	In – severe cold weather could lead to ice build-up on blades.	Ice build-up could lead to ice throw, or to blade damage and throw.	The Proposed Development chapter.
Floods	Low	Very Low	In – a high level flood risk assessment will be undertaken as part of the EIA.	Damage to turbines or infrastructure from flooding, or increase in flood risk elsewhere from development in flood zones.	Wind farm site selection and design and Water Environment chapters.
Terrorist incidents	No	No	Out	N/A	N/A
Cyber attacks	No	No	Out	N/A	N/A
Disruptive industrial action	No	No	Out	N/A	N/A
Public disorder	No	No	Out	N/A	N/A
Wildfires	No	No	Out	N/A	N/A
Severe space weather	No	No	Out	N/A	N/A
Poor air quality events	No	No	Out	N/A	N/A

Major Accident or Disaster	Risk due to location	Risk due to project	Scoped in/out due to risk	Rationale	Environmental Statement Chapter
Transport accidents	No	Yes	In – abnormal loads and increase in traffic from construction.	Abnormal loads or an increase in traffic could lead to an increased risk of accidents. Road network may be unsuitable for such traffic, further increasing accident risk.	Wind farm site selection and design and Traffic and Transport chapters.
Industrial accidents	No	Yes	In – from construction and maintenance activities.	Manual labour, working at height and use of specialist plant all bring risk of industrial accidents. Relevant UK health and safety legislation will be adhered to; site construction management practices will include, but are not limited to, temporary diversions of public rights of way, relevant signage and fencing of potentially hazardous construction areas where appropriate.	Construction activities are covered by separate H&S legislation and guidelines. Wind farm site selection and design, Water Environment and Biodiversity chapters.
Urban fires	No	No	Out	The Development is not in close proximity to any urban areas.	

13.7 QUESTIONS FOR CONSULTEES

Question 13.1	Are consultees in agreement with the scoping out of socio-economic effects?
Question 13.2	Do the consultees consider that the proposed use of the Scottish Government calculator to assess carbon savings from wind farm developments on peatlands is appropriate?
Question 13.3	Are consultees in agreement with the proposals for the assessment of telecommunications and utilities, shadow flicker, human health and major accidents and disasters?
Question 13.4	Are there any other relevant consultees who should be consulted about the other EIA topic assessments?

14 CONCLUSION

14.1 Pennant Walters is proposing to apply for permission to construct and operate Mynydd Llanhilleth Wind Farm, which is proposed to be located to the east of Llanhilleth. This Scoping Report is submitted in relation to the Development, which proposes the construction and operation of up to twelve wind turbines with a maximum tip height of 180m together with associated and ancillary development.

14.2 The turbines will have a combined installed capacity of over 10 megawatts and, as such, falls within the definition of a 'Development of National Significance'. The Development exceeds the threshold for wind developments as set out in Schedule 2 and on the basis that the Development could result in 'significant' environmental effects according to the Regulations, in line with Schedule 3, the Development is classified as an Environmental Impact Assessment development and an Environmental Statement is required.

14.3 The purpose of this Report is to ensure that the subsequent EIA is focused on the key impacts likely to give rise to significant adverse effects, and to obtain agreement on the EIA approach and scope. This Report has set out the relevant law, policy and guidance for each topic; the consultation undertaken to date; the baseline conditions on the Site for those topics; the proposed assessment methodology; the potential significant effects arising from the Development; any likely cumulative and in-combination effects; effects scoped out; the approach to mitigation; and questions for consultees.

14.4 As well as identifying elements to be considered in the EIA, this Report also identifies those elements that are not considered necessary to assess further, as set out in Table 15-1 below. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice.

Table 14-1: Effects scoped out

Ecology & Biodiversity	• Reptile, otter, water vole, dormouse, great crested newt and badger.
Ornithology	• Certain common breeding bird, woodland point count, black grouse, passerines (skylark and meadow pipet), and long-eared owl.
Landscape & Visual Impact	• All receptors within the LVIA study area of 26km that are outwith the blade tip ZTV would experience no change to the view; • Local/regional landscape and visual receptors beyond the detailed study area of 15km from the Development, subject to viewpoint analysis; • Effects on LANDMAP aspect areas outside of the study, where it is judged that potential significant effects are unlikely to occur • Effects of decommissioning of the proposed wind farm at the end of its operational phase.
Cultural Heritage & Archaeology	• Direct effects to assets beyond the development footprint;

	• Decommissioning phase: this should not result in damage to historic assets as any ground disturbance would already have occurred during the construction phase; and • Effects related to setting change for historic assets lying more than 10km from the Site.
Hydrology	• Impact of priority substances and priority hazardous substances.
Hydrogeology, Geology & Ground Conditions	• Potential effects on land or groundwater quality during the construction phase due to accidental release of contaminants (including oils, fuels, chemicals and waste) from construction plant or machinery or waste storage points e.g., accidental spillages or leaks, or due to release of silty or otherwise contaminated groundwater from excavations, as these risks can be adequately managed through the Construction Environmental Management Plan (CEMP), and significant effects are, therefore, unlikely. • Potential effects on geodiversity through physical changes to or loss of access to the designated RIGS at Llanhilleth Quarry have been scoped out on the basis that the RIGS is outside the developable area identified for the Development. • Potential effects on mineral reserves: although a planning application has been submitted for recovery of secondary aggregates from the former open-cast coal mining spoil heap at Tir Pentwys, it is understood that this development, if approved, would not impact on the remaining undisturbed coal or other mineral resources, and Tir Pentwys is outside the developable area identified for the Development. No planning applications to extract coal or other undisturbed mineral resources beneath the developable area of the Development site are known of and given that the Development footprint will only occupy a small proportion of the Site it is proposed that effects on minerals can be scoped out of the EIA.
Transport, Movement & Access	• Operational traffic; • Traffic and transport effects during the decommissioning phase.
Noise & Vibration	• Blasting would be very unlikely, however, if any blasting is to occur it would be controlled via a blasting management plan as part of a planning condition requirement. • Noise emissions from construction activities other than piling and traffic (noise from haul route use on-site would be scoped out) are unlikely to be sufficiently high, given the distance of the Development to Noise Sensitive Receptors, to warrant a noise assessment. However, planning conditions regarding standard times of work should apply.

	• Operational traffic noise during the operation of the Development is scoped out as the amount of traffic associated with development operation would be minimal. • Vibration associated with on-site construction noise and construction traffic. • Vibration effects during operation. • The effects of decommissioning on any Noise Sensitive Receptors are likely to be similar in nature but of lower magnitude than those during the construction phase. As a result, it is not proposed to assess the decommissioning phase of the development in addition to that of the construction phase.

14.5 We have also consolidated the list of questions posed in each chapter below for your ease. We would be grateful if responses to these queries could be provided as part of the issued EIA Scoping Direction.

Question 2.1	Are there other wind farm proposals or other developments that are candidates for possible consideration in the cumulative assessment?
Question 3.1	Consultees are requested to confirm that the assessment methods/approach specified within the relevant chapters of this scoping report for this approach are appropriate for assessing that wider grid connection corridor.
Question 4.1	Do consultees consider that all the relevant legislation, policy, advice and guidance have been identified to frame this assessment?
Question 5.1	Do consultees consider the study area appropriate?
Question 5.2	Do consultees consider the scope of the baseline surveys and those methodologies employed to date sufficient and proportionate in respect of the Development?
Question 5.3	Do consultees consider the scope of the further detailed surveys proposed sufficient and proportionate in respect of the Development?
Question 5.4	Do consultees agree with the statutory and non-statutory sites to be scoped in / out of the assessment?
Question 5.5	Do consultees agree with the IEFs to be scoped in / out of the assessment?

Question 5.6	Do consultees require for the delivery of any specific mitigation with respect to those protected or priority species and habitats identified for the study area to date?
Question 5.7	Are there any other relevant consultees who should be consulted about this topic?
Question 6.1:	Are consultees satisfied that the study areas and VP coverage are appropriate?
Question 6.2:	Do consultees consider the scope of the ornithological baseline surveys and those methodologies employed to date sufficient and proportionate in respect of the Development?
Question 6.3:	Do consultees consider the scope of the further detailed surveys proposed sufficient and proportionate in respect of the Development?
Question 6.4:	Do consultees agree with the statutory and non-statutory sites to be scoped in/out of the assessment?
Question 6.5:	Do consultees agree with the IOFs to be scoped in/out of the assessment?
Question 6.6:	As a precaution, gull species and the Severn Estuary Ramsar and Flat Holm and Steep Holm SSSI have been scoped into the OIA. However, based on the ongoing findings, EDP considers that it is likely they can be scoped out. Do consultees agree?
Question 6.7:	Do consultees require the delivery of any specific bird mitigation?
Question 6.8:	Are there any other relevant consultees who should be consulted about this topic?
Question 7.1	Do consultees consider the scope and method of the assessment sufficient and proportionate?
Question 7.2	Do consultees consider the study area parameters summarised at Table 7.4 acceptable in respect of the Development, and are there any elements that could be refined further, in the consultees experience to reduce the scope suggested?
Question 7.3	Do consultees agree with the scope of the proposed viewpoint selection provided at Table 7.2?
Question 7.4	Wireframes are proposed from all viewpoints identified. Do consultees have specific viewpoints the request photomontages are prepared for?

Question 7.5	Do the consultees have a preference for which views should be included in the night time assessment?
Question 7.6	Do consultees feel that 2-3 viewpoints within 5km of the Site is proportionate for the night-time assessment?
Question 7.7	Can the consultees provide a list of proposals to be assessed as part of the Cumulative LVIA?
Question 7.8	Do consultees agree that the Cumulative LVIA should only assess consented and operational wind farm schemes as well as those in planning in accordance with SNH guidance?
Question 7.9	Do consultees agree that the 26km study area proposed for the Cumulative LVIA is sufficient and proportionate in respect of the Development?
Question 7.10	Are there any other relevant guidance documents not referenced (or any other issues for consideration) that the Consultees would recommend to inform this topic?
Question 7.11	Are there any other relevant consultees who should be consulted about this topic?
Question 8.1:	Do consultees consider the study areas appropriate?
Question 8.2:	Are there any other relevant consultees who should be consulted about this topic?
Question 8.3:	Are consultees aware of any other supplementary guidance of relevance to assessment of cultural heritage and archaeology effects?
Question 8.4:	Is the approach to the assessment of effects, including those effects scoped in and out and the cumulative assessment, appropriate?
Question 8.5:	Is the approach to field survey considered appropriate?
Question 8.6:	Do the consultees advise that HIA for the Blaenavon WHS is required, and is the proposed methodology considered appropriate?
Question 8.7:	Are consultees able to confirm that no buffer zone has been formally adopted for the Blaenavon WHS?
Question 8.8:	Are consultees able to recommend any HIA Reports for WHS in Wales, or for industrial WHS landscapes elsewhere, which would be an exemplar for the HIA for this Development?

Question 9.1	Is there any other baseline information on the hydrological environment that should be assessed?
Question 9.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the hydrology receptors?
Question 9.3:	Have all relevant potential impacts on hydrology been identified that might arise from the Development?
Question 9.4	Do you agree with the hydrology impacts that have been scoped in and out of the assessment, together with the reasons for doing so?
Question 9.5	Are the embedded mitigation measures sufficient to avoid the significant impacts identified?
Question 10.1	Is there any other baseline information on the hydrogeology, geology and ground conditions that should be assessed?
Question 10.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the hydrogeology, geology and ground conditions receptors?
Question 10.3:	Have all relevant potential impacts on hydrogeology, geology and ground conditions been identified that might arise from the Development?
Question 10.4	Do you agree with the hydrogeology, geology and ground conditions impacts that have been scoped in and out of the assessment, together with the reasons for doing so?
Question 10.5	Are the embedded mitigation measures sufficient to avoid the significant impacts identified?
Question 11.1	Is there any other baseline information in relation traffic or the highway network that should be considered?
Question 11.2	Are there any committed developments or highway schemes that may affect the future baseline?
Question 11.2	Do you agree with the proposed approach for the assessment of the effects of the Development on the potential receptors?
Question 11.2	Have all relevant potential impacts been identified that might arise from the Development?

Question 11.2	Do you agree with the transport impacts that have been scoped in and out of the assessment, together with the reasons for doing so?
Question 12.1	Do the consultees agree with the suggested approach for the noise assessment?
Question 12.2	Do the relevant Local Authorities agree with the noise topics proposed to be scoped out of the EIA?

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Scoping Site Boundary

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Figure 1.1 – Scoping Site Boundary

date	**04 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d045**	checked	**KH**
scale	**1:15,000 @ A3**	QA	

the environmental dimension partnership

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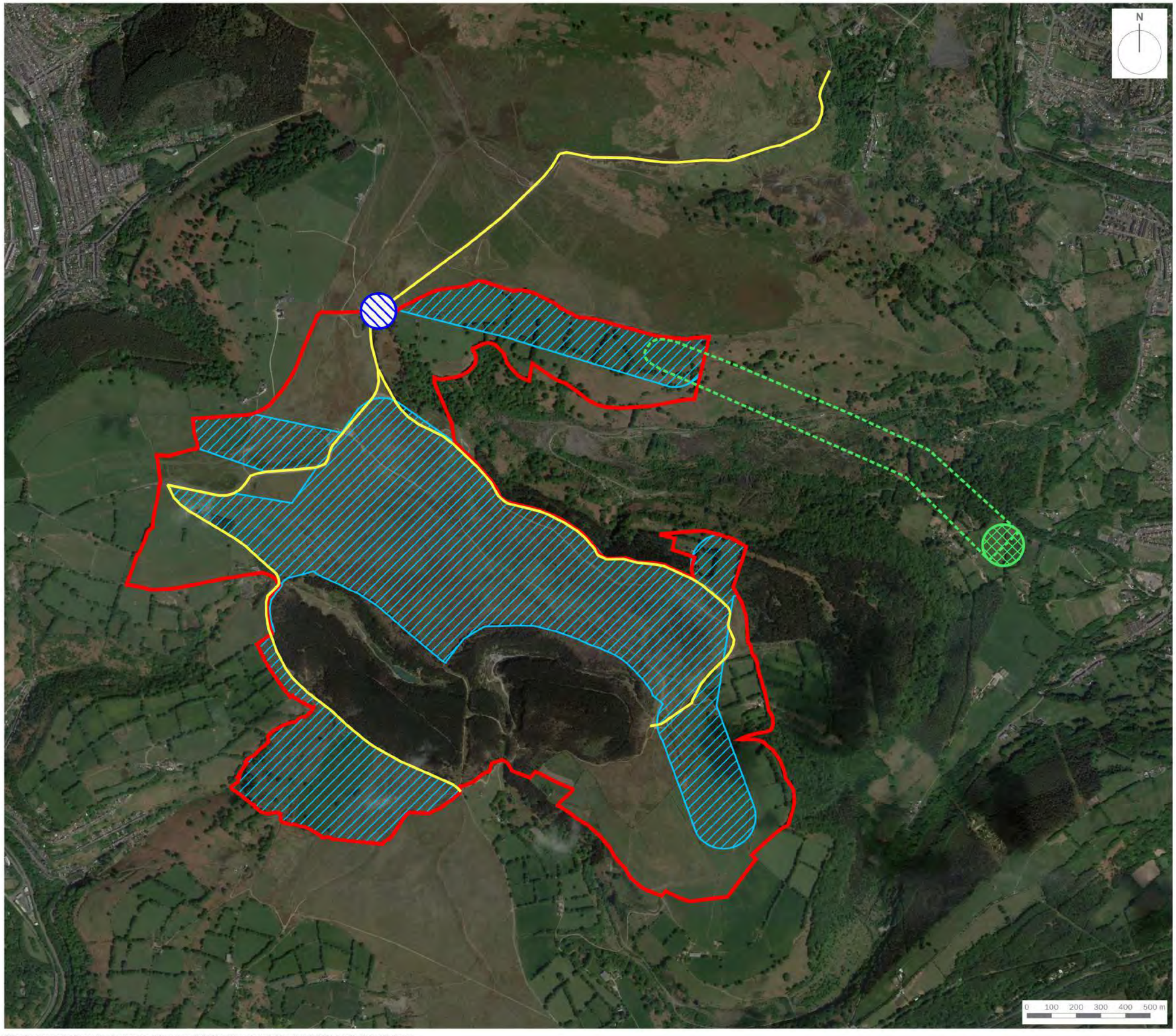

Scoping Site Boundary

Developable Area for Mynydd Llanhilleth Wind Farm

Access Route/Corridor

Site Access Point

Grid Connection

Grid Connection Point

Grid Connection Corridor

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Figure 3.1 – Indicative Site Layout

date	**18 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d045a**	checked	**KH**
scale	**1:15,000 @ A3**	QA	**GY**

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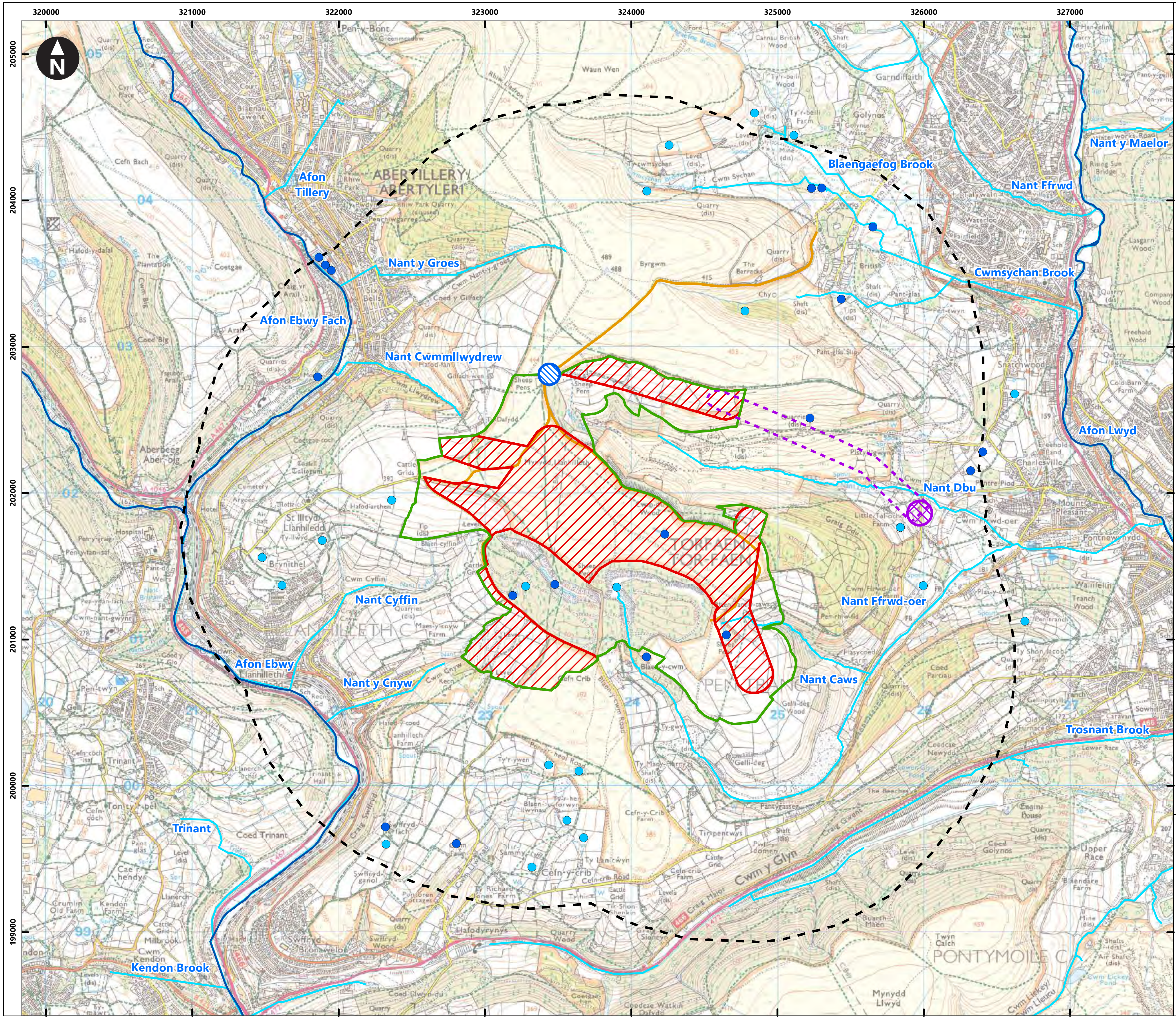

Key

- 1.5km Area of Interest
- Study Area
- Access Route/Corridor
- Site Access Point
- Developable Area

Grid Connection

- Grid Connection Corridor
- Grid Connection Point
- Main tributaries
- NRW Main Rivers
- Ponds & lakes
- Springs

0 400 800 1,200 m

Scale at A3: 1:25,000

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Figure 9.1 Site location plan and hydrological setting

May 2021

wood.

42863-WOOD-XX-XX-FG-OW-0008_S0_P01.2

\\Sal-fs12\shared\Projects\42863 Mynydd Carn y Cefn\Deliver Stage\D Design_Technical\Drawings\ArcGIS\MXD\42863-WOOD-XX-XX-FG-OW-0008_S0_P01.2.mxd Originator: tom.suter

320000 321000 322000 323000 324000 325000 326000 327000

205000 204000 203000 202000 201000 200000 199000

Afon Ebwy Fach

Afon Ebwy

Nant y Maelor

Afon Lwyd

ABERTILLERY / ABERTYLERI

TORFAEN / TORFAEN

ANHILLETH C

PENTRANCH C

PONTYMOILE C

Key

- Study Area
- 1.5km Area of Interest
- Access Route/Corridor
- Developable Area
- Site Access Point

Grid Connection

- Grid Connection Corridor
- Grid Connection Point

- NRW Main Rivers
- Flood Zone 3
- Flood Zone 2
- Flood Zone 1

0 500 1,000 1,500 m

Scale at A3: 1:25,000

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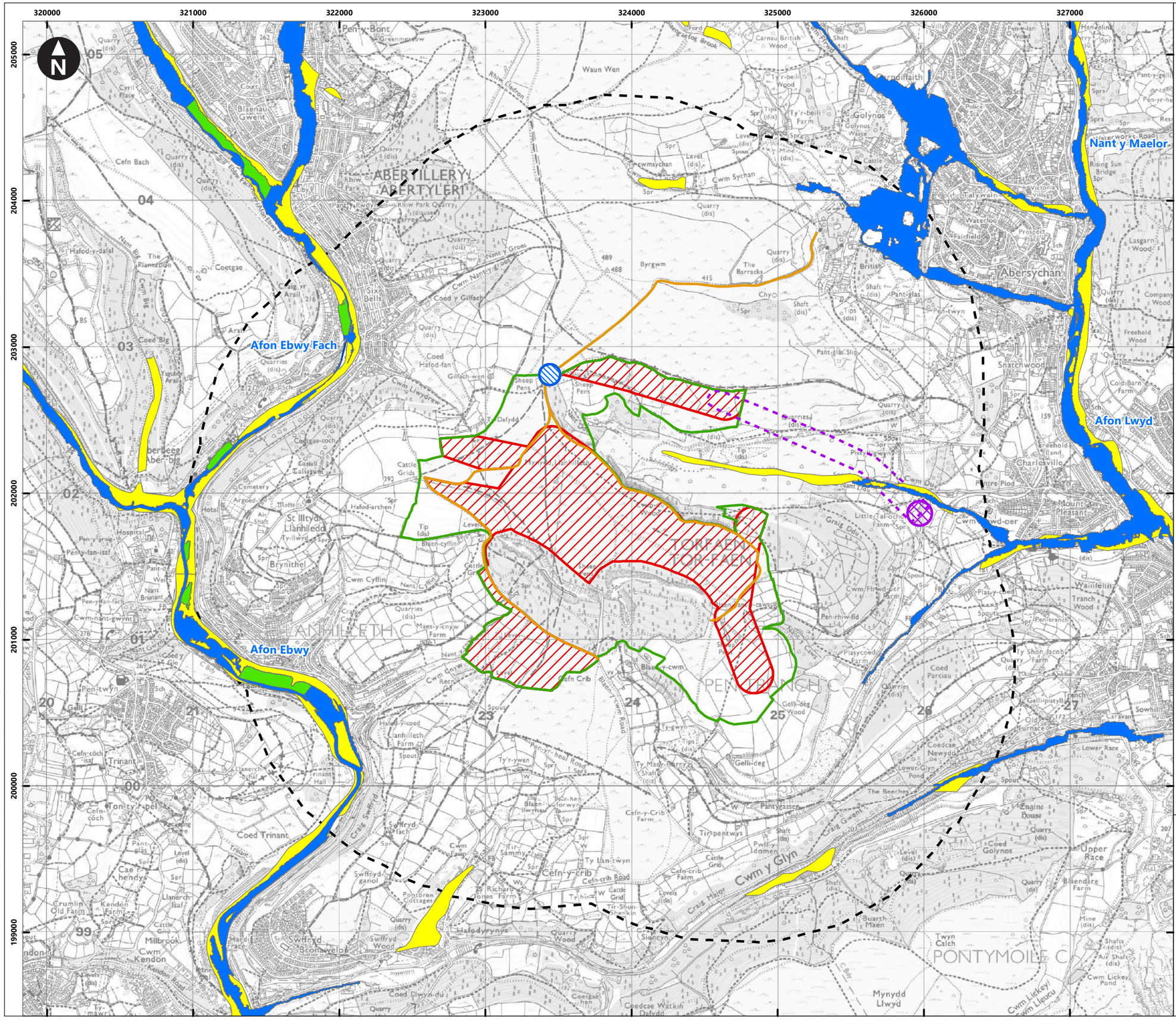
Figure 9.2 NRW Flood Risk Map for Planning

May 2021

wood.



Key

- Study Area
- 1.5km Area of Interest
- Access Route/Corridor
- Developable Area
- Site Access Point

Grid Connection

- Grid Connection Corridor
- Grid Connection Point

- NRW Main Rivers
- Development Advice Map - Zone A
- Development Advice Map - Zone B
- Development Advice Map - Zone C1
- Development Advice Map - Zone C2

0 500 1,000 1,500 m

Scale at A3: 1:25,000

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Mynydd Llanhilleth Wind Farm

Figure 9.3 NRW Development Advice Map (Flood Zones B, C1 and C2)

May 2021

wood.

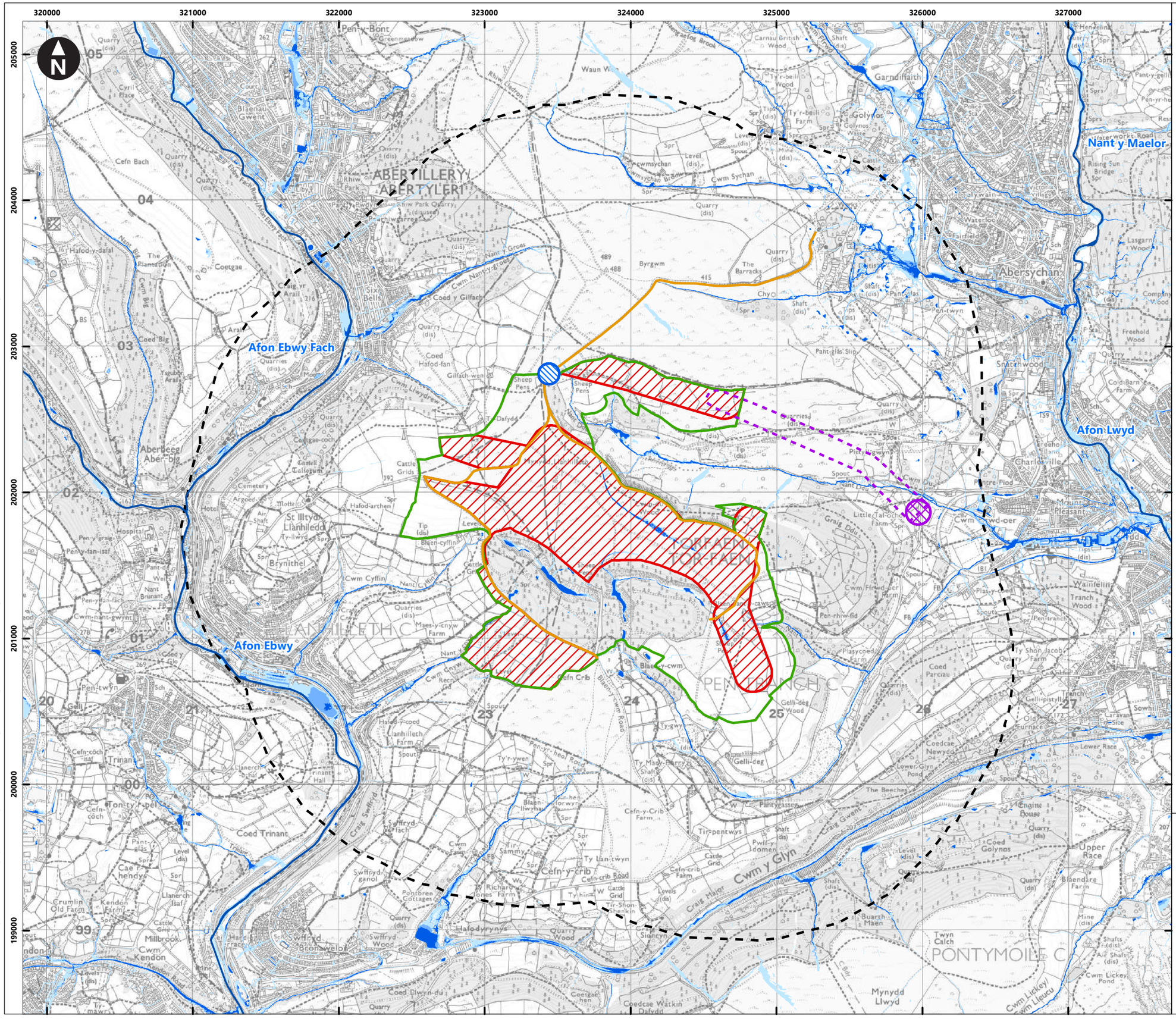

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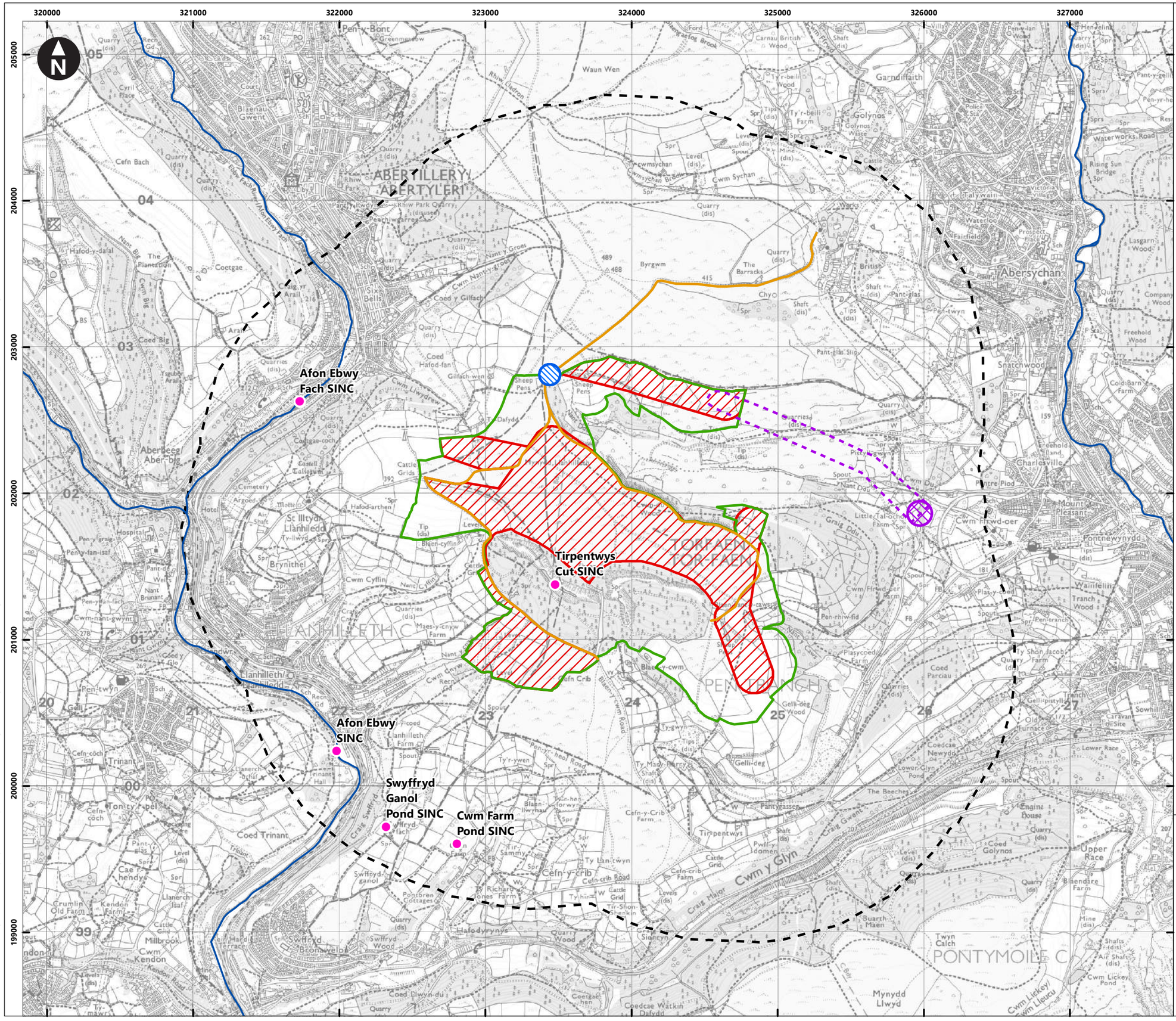
Figure 9.4 NRW Risk of Flooding from Surface Water

May 2021



Key

- Study Area
- 1.5km Area of Interest
- Access Route/Corridor
- Developable Area
- Site Access Point

Grid Connection

- Grid Connection Corridor
- Grid Connection Point
- NRW Main Rivers
- SINC

0 500 1,000 1,500 m

Scale at A3: 1:25,000

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Figure 9.5 Sites of Importance for Nature Conservation (SINC)

May 2021

wood.

Appendix 5.1: Study Area (edp6367_d017a 13 May 2021 MJC/KH)

Study Area

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Study Area

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d017a**	checked	**KH**
scale	**1:15,000 @ A3**	QA	**GY**

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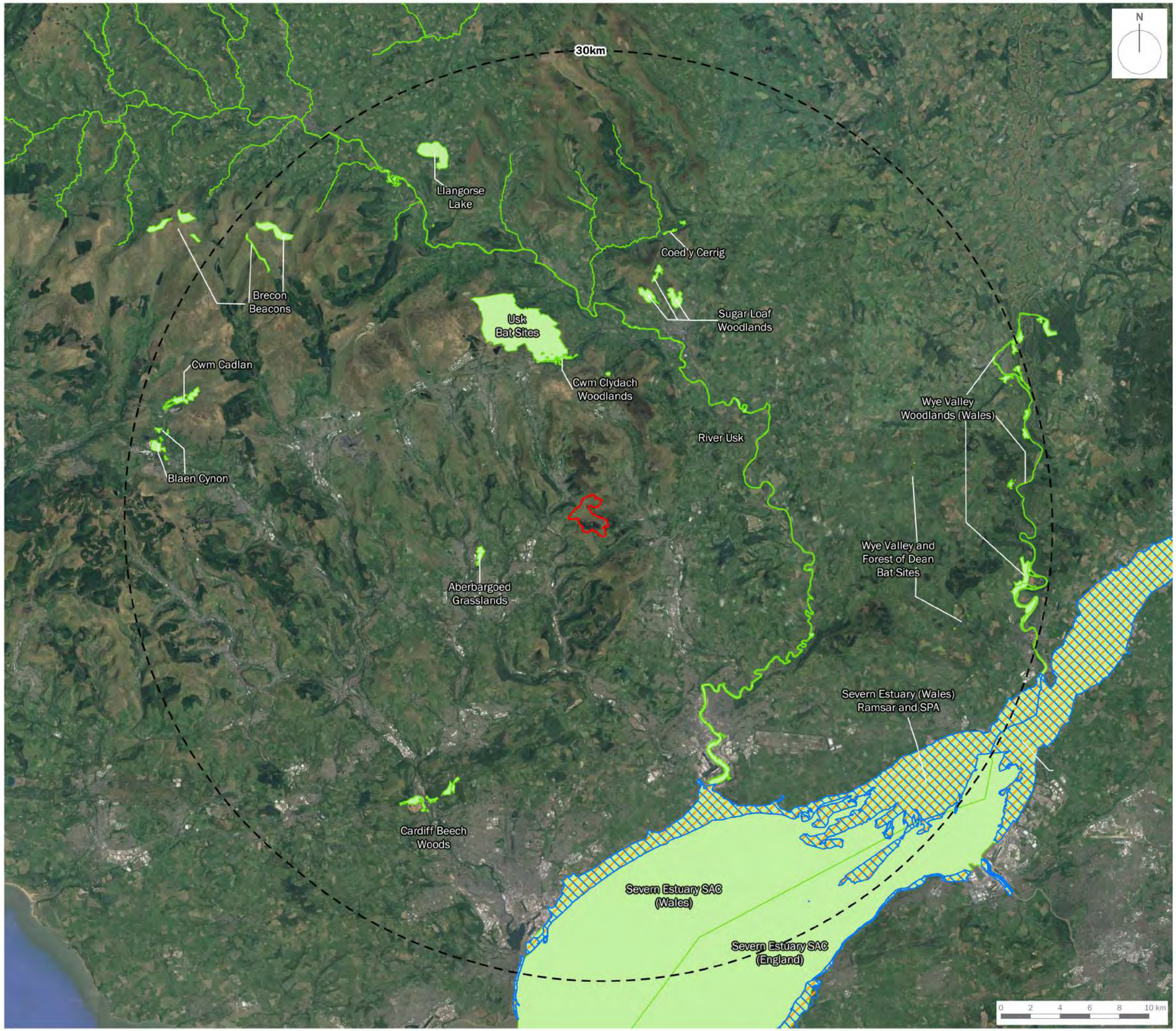
Appendix 5.2: Internationally Designated Sites (edp6367_d013a 13 May 2021 MJC/KH)



Survey Boundary

30km Buffer

Special Area of Conservation (SAC)

Special Protection Area (SPA)

Ramsar Site

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Internationally Designated Sites

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d013a**	checked	**KH**
scale	**1:250,000 @ A3**	QA	**GY**

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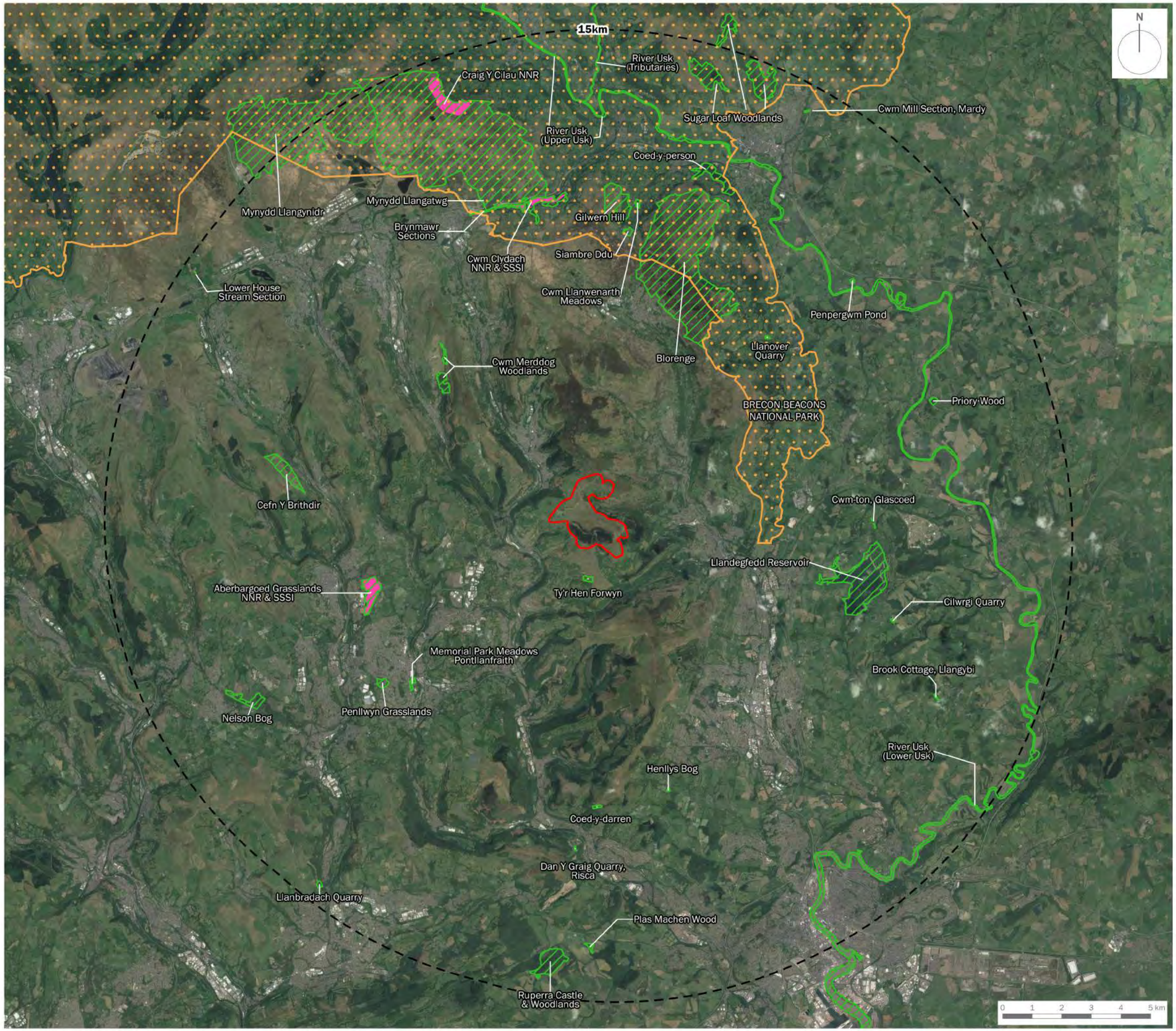
Appendix 5.3: Nationally Designated Sites (edp6367_d014a 13 May 2021 MJC/KH)



Survey Boundary

15km Buffer

Site of Special Scientific Interest (SSSI)

National Nature Reserve (NNR)

National Park

client

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project title

Mynydd Llanhilleth Wind Farm

drawing title

Nationally Designated Sites

date	13 MAY 2021	drawn by	MJC
drawing number	edp6367_d014a	checked	KH
scale	1:125,000 @ A3	QA	GY

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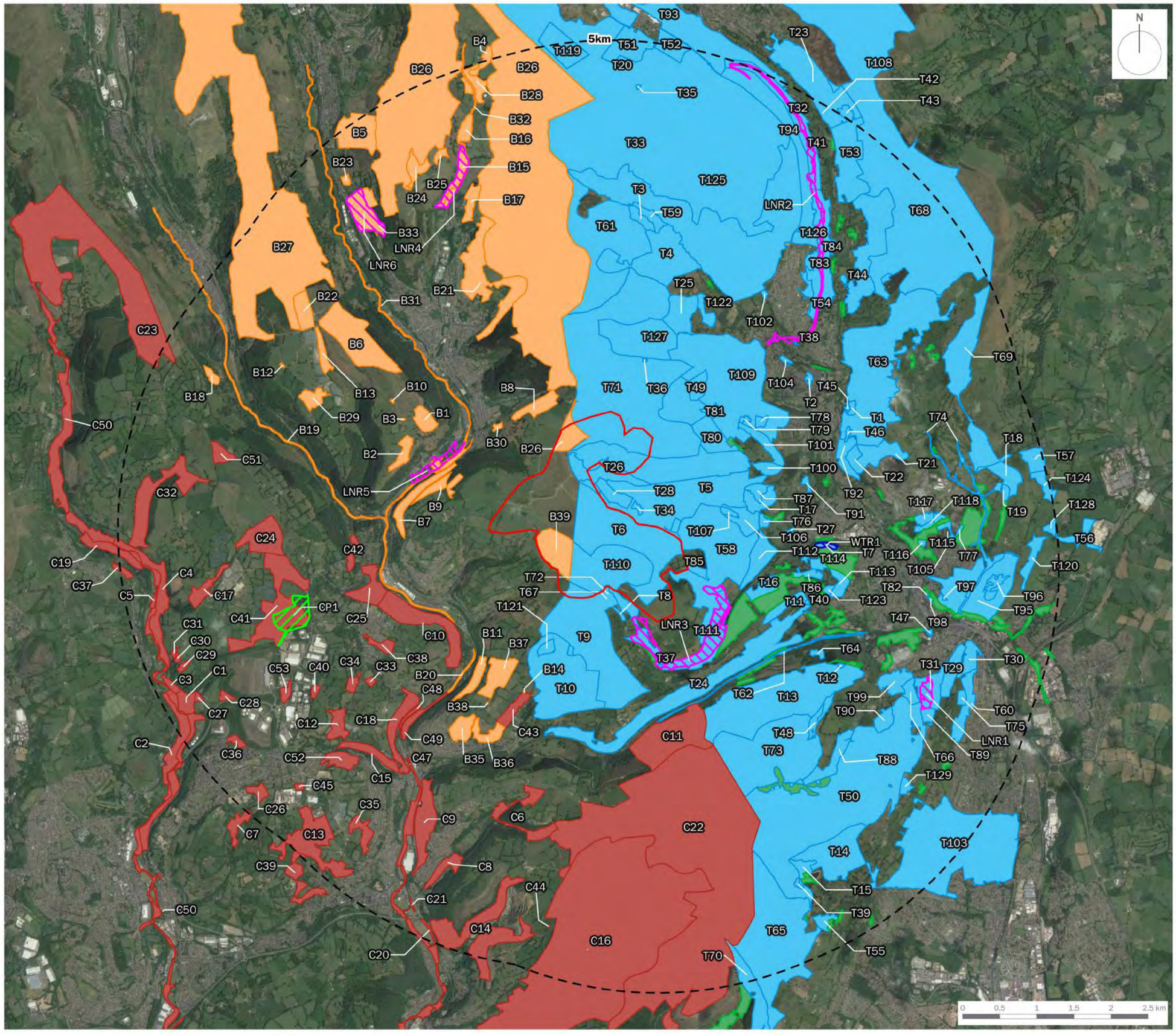
Appendix 5.4: Non-statutory Designated Sites (edp6367_d015a 13 May 2021 MJC/KH)



Survey Boundary

5km Buffer

Country Park

Local Nature Reserve (LNR)

Wildlife Trust Reserve

Ancient Semi-natural Woodland

Sites of Importance for Nature Conservation (SINC) (by local authority)

Blaenau Gwent

Caerphilly

Torfaen

Key to Labels:

B - Blaenau Gwent SINC
C - Caerphilly SINC
CP - Country Park
LNR - Local Nature Reserve
T - Torfaen SINC
WTR - Wildlife Trust Reserve

See appendix for list of site names

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Non-statutory Designated Sites

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d015a**	checked	**KH**
scale	**1:50,000 @ A3**	QA	**GY**

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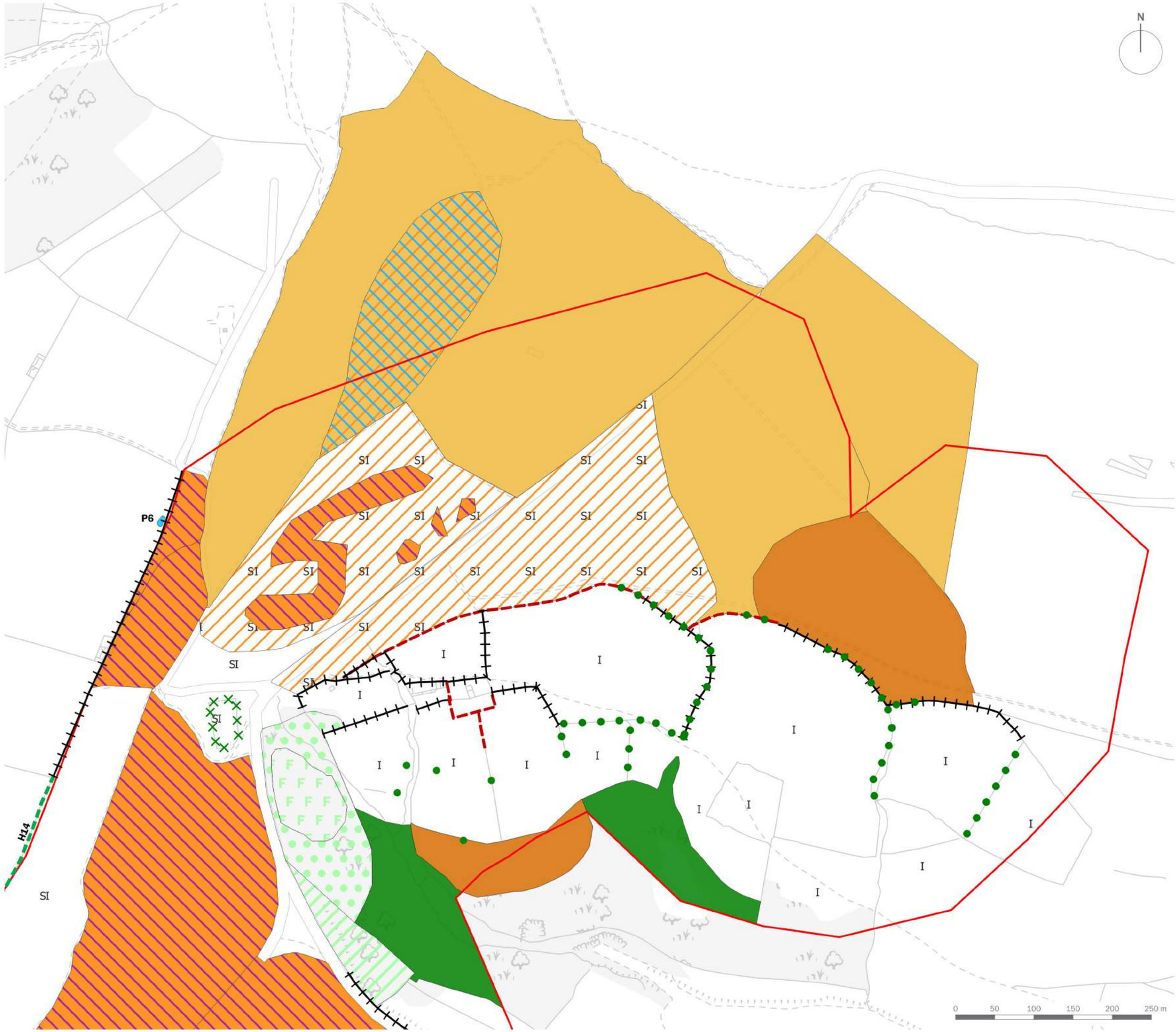
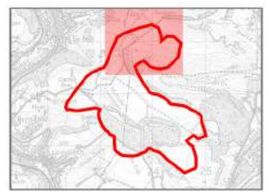
Appendix 5.5: Phase 1 Habitat Survey (edp6367_d002a 12 May 2021 MJC/EWI)



Survey Boundary
Broadleaved Semi-natural Woodland
Coniferous Plantation Woodland
Scattered Coniferous Trees
Recently Felled Coniferous Woodland
Marsh/Marshy Grassland
Improved Grassland
Semi-improved Acid Grassland
Poor Semi-improved Grassland
Rush Pasture, Acid Grassland, and Heath Mosaic
Standing Water
Continuous Bracken
Dry Dwarf Shrub Heath
Scattered Broad-leaved Trees
Defunct Species-poor Hedgerow
Wall
Fence



client
Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Phase 1 Habitat Survey (Sheet 1 of 5)

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d002a**	checked	**EWI**
scale	**Refer to scale bar @ A3**	QA	**GY**

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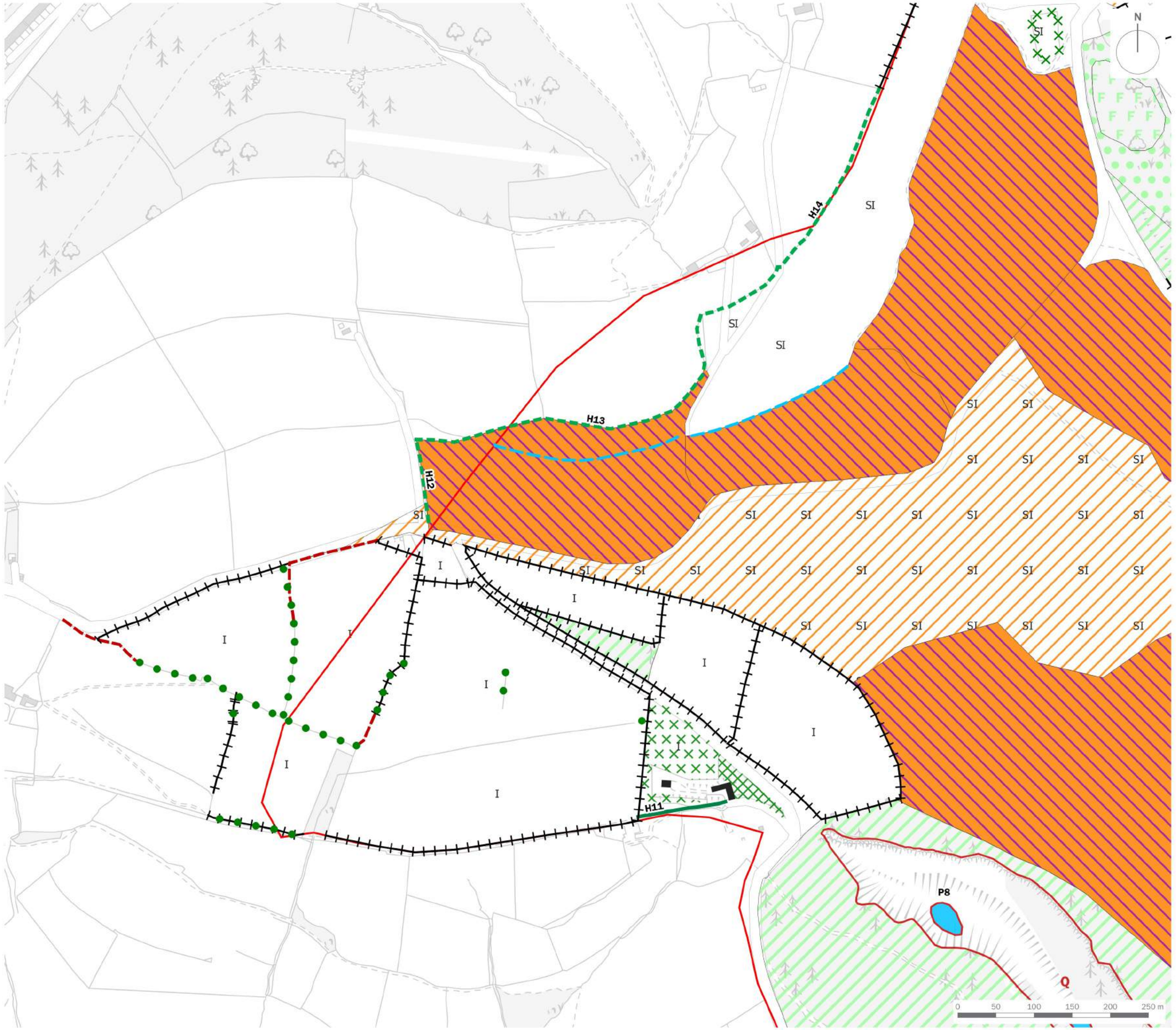
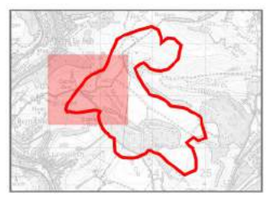


Survey Boundary
Coniferous Plantation Woodland
Scattered Coniferous Trees
Recently Felled Coniferous Woodland
Dense Continuous Scrub
Scattered Scrub
Marsh/Marshy Grassland
I Improved Grassland
SI Semi-improved Acid Grassland
SI Poor Semi-improved Grassland
Buildings
Standing Water
Q Quarry
Scattered Broad-leaved Trees
Intact Species-poor Hedgerow
Defunct Species-poor Hedgerow
Dry Ditch
Wall
Fence



client
Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Phase 1 Habitat Survey (Sheet 2 of 5)

date	12 MAY 2021	drawn by	MJC
drawing number	edp6367_d002a	checked	EWI
scale	Refer to scale bar @ A3	QA	GY

edp the environmental dimension partnership
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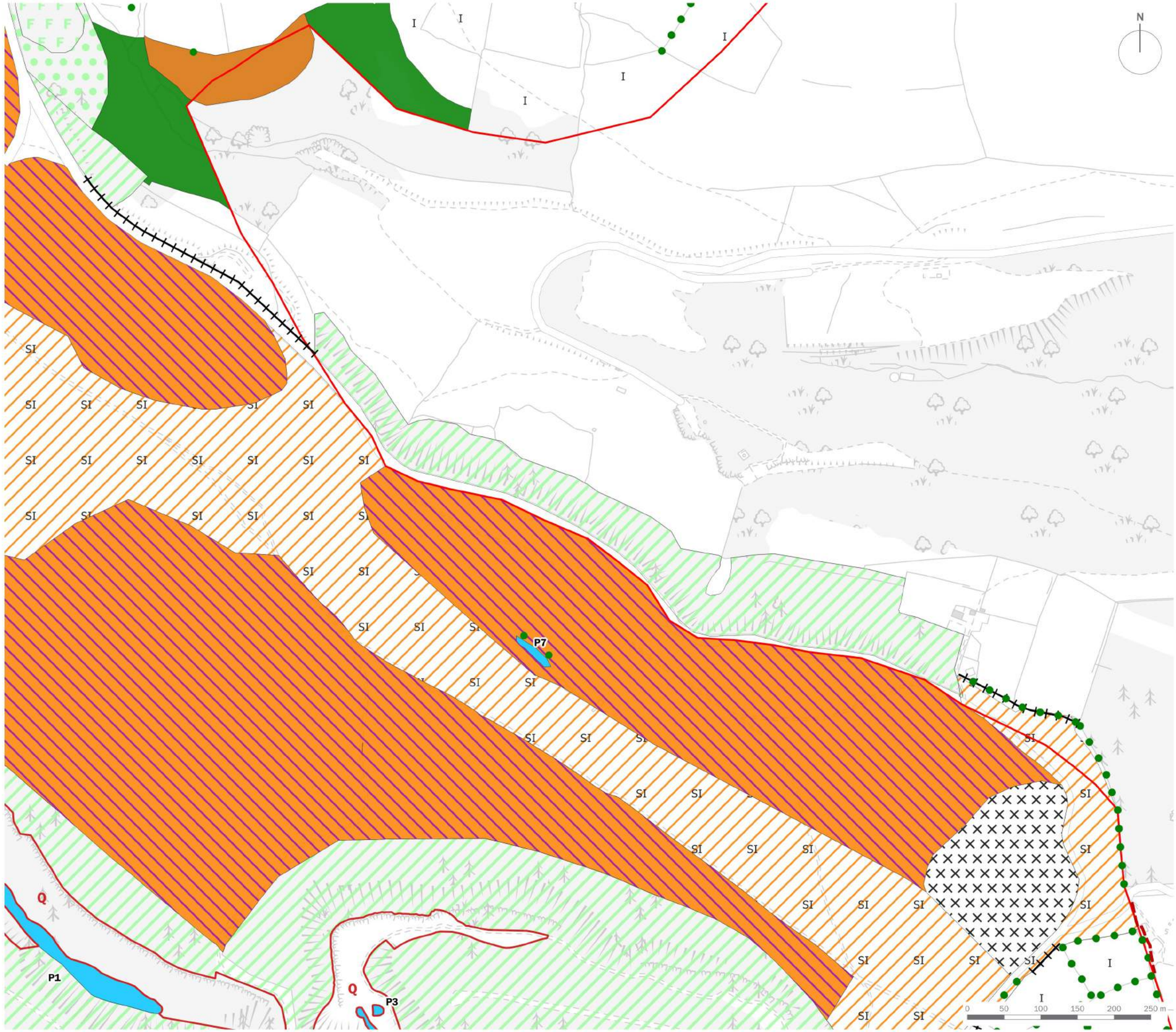


Survey Boundary

Broadleaved Semi-natural Woodland

Coniferous Plantation Woodland

Scattered Coniferous Trees

Recently Felled Coniferous Woodland

Marsh/Marshy Grassland

I Improved Grassland

SI Semi-improved Acid Grassland

Ephemeral/short Perennial

Standing Water

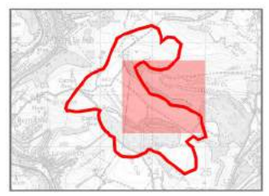
Continuous Bracken

Q Quarry

Scattered Broad-leaved Trees

Wall

Fence



client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Phase 1 Habitat Survey (Sheet 3 of 5)

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d002a**	checked	**EWI**
scale	**Refer to scale bar @ A3**	QA	**GY**

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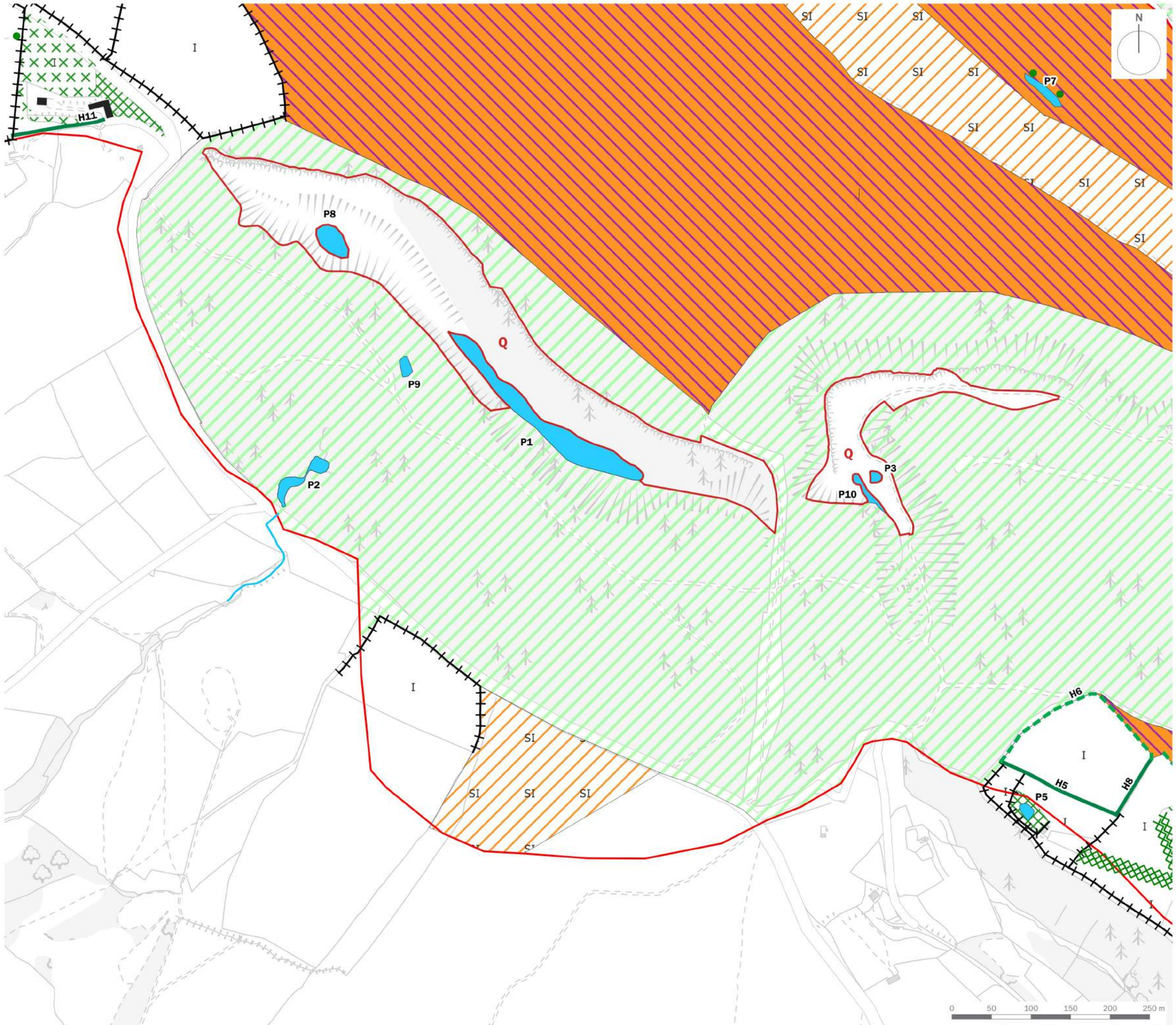
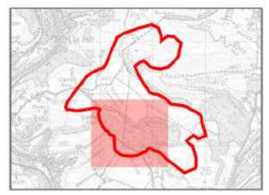


Survey Boundary
Coniferous Plantation Woodland
Dense Continuous Scrub
Scattered Scrub
Marsh/Marshy Grassland
I Improved Grassland
SI Semi-improved Acid Grassland
Buildings
Standing Water
Q Quarry
Intact Species-poor Hedgerow
Defunct Species-poor Hedgerow
Running Water
Fence



client
Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Phase 1 Habitat Survey
(Sheet 4 of 5)

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d002a**	checked	**EWI**
scale	**Refer to scale bar @ A3**	QA	**GY**

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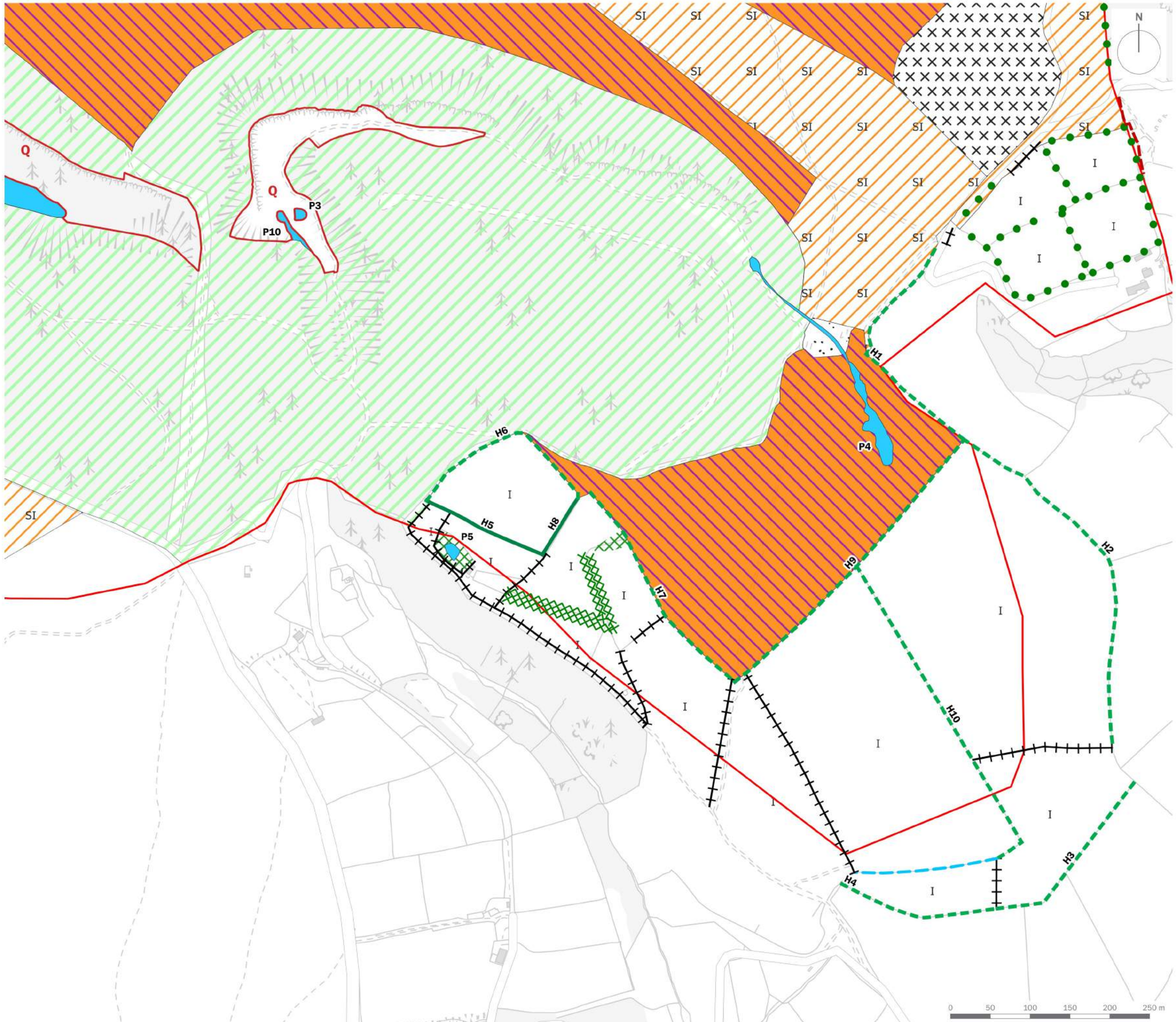
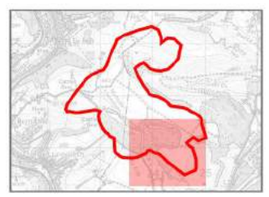


Survey Boundary
Coniferous Plantation Woodland
Dense Continuous Scrub
Marsh/Marshy Grassland
Improved Grassland
Semi-improved Acid Grassland
Ephemeral/short Perennial
Bare Ground
Standing Water
Quarry
Scattered Broad-leaved Trees
Intact Species-poor Hedgerow
Defunct Species-poor Hedgerow
Dry Ditch
Wall
Fence



client
Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Phase 1 Habitat Survey
(Sheet 5 of 5)

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d002a**	checked	**EWI**
scale	**Refer to scale bar @ A3**	QA	**GY**

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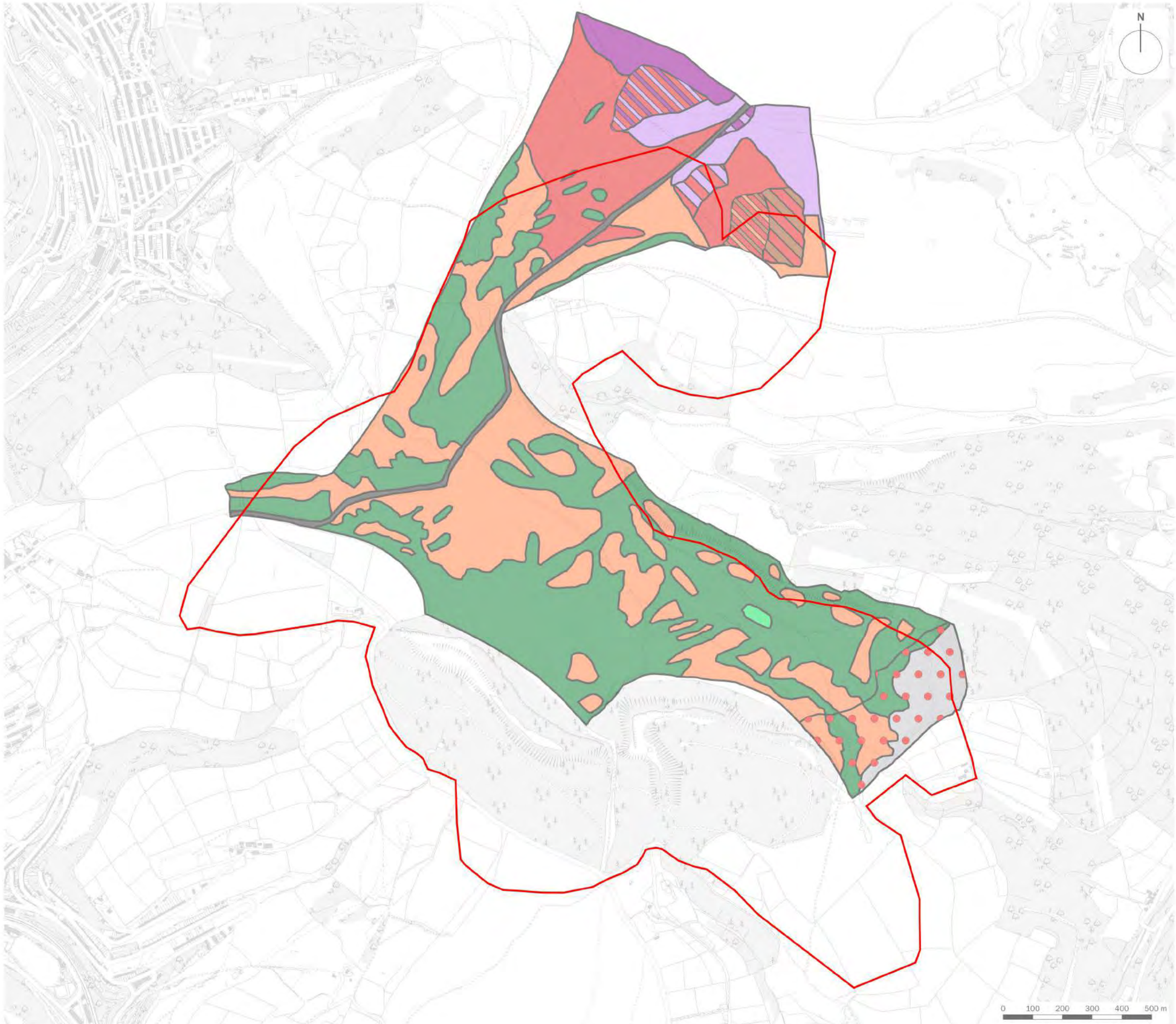
Appendix 5.6: Botanical Survey (edp6367_d016a 13 May 2021 MJC/KH)



- Survey Boundary
- Acidic grassland
- Bilberry-dominated community
- Crowberry-dominated community
- Heather-dominated dwarf shrub
- Bilberry and crowberry co-dominant
- Bilberry and crowberry co-dominant
- Bracken over bilberry-dominated community
- Bracken over sparse bilberry and acidic grassland
- Heather amongst co-dominant crowberry and billberry
- Marshy grassland (Juncus effusus dominant)
- Mosaic of moss species, marshy grassland and acidic grassland
- Area impacted by fire: regeneration occurring
- Trees
- Road

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Botanical Survey

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d016a**	checked	**KH**
scale	**1:12,500 @ A3**	QA	**GY**

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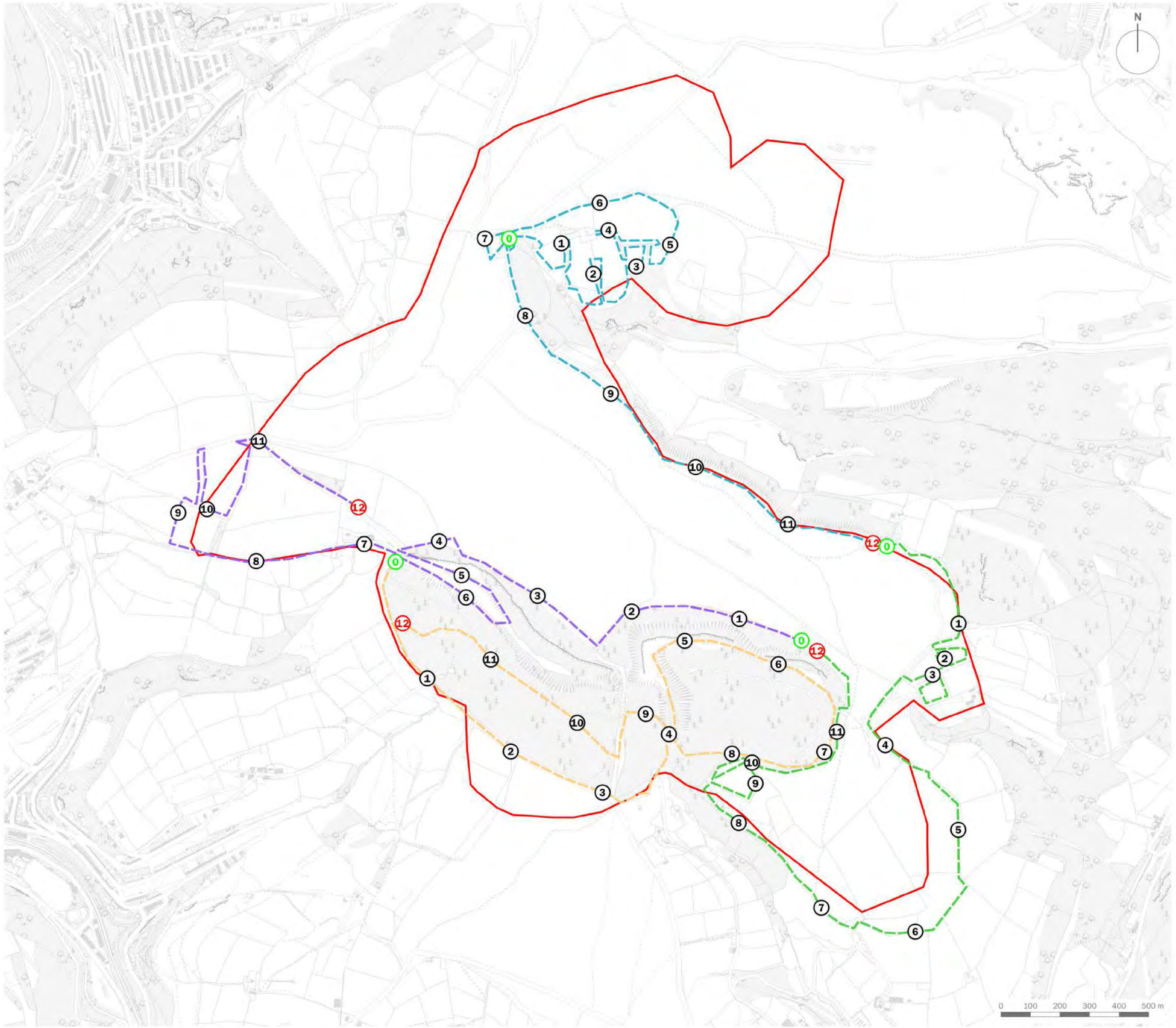
Appendix 5.6: Bat Activity Transect Routes (edp6367_d009a 13 May 2021 MJC/KH)



Survey Boundary

Bat Transect Routes

N E Farmland Transect (6,574m)

SE Farmland Transect (6,528m)

Woodland N Edge Transect (7,094m)

Woodland S Edge & Interior Transect (6,255m)

Pacing Point

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Bat Transect Routes
(Sheet 1 of 2 - May 2020)

date	13 MAY 2020	drawn by	MJC
drawing number	edp6367_d009a	checked	KH
scale	1:12,500 @ A3	QA	GY

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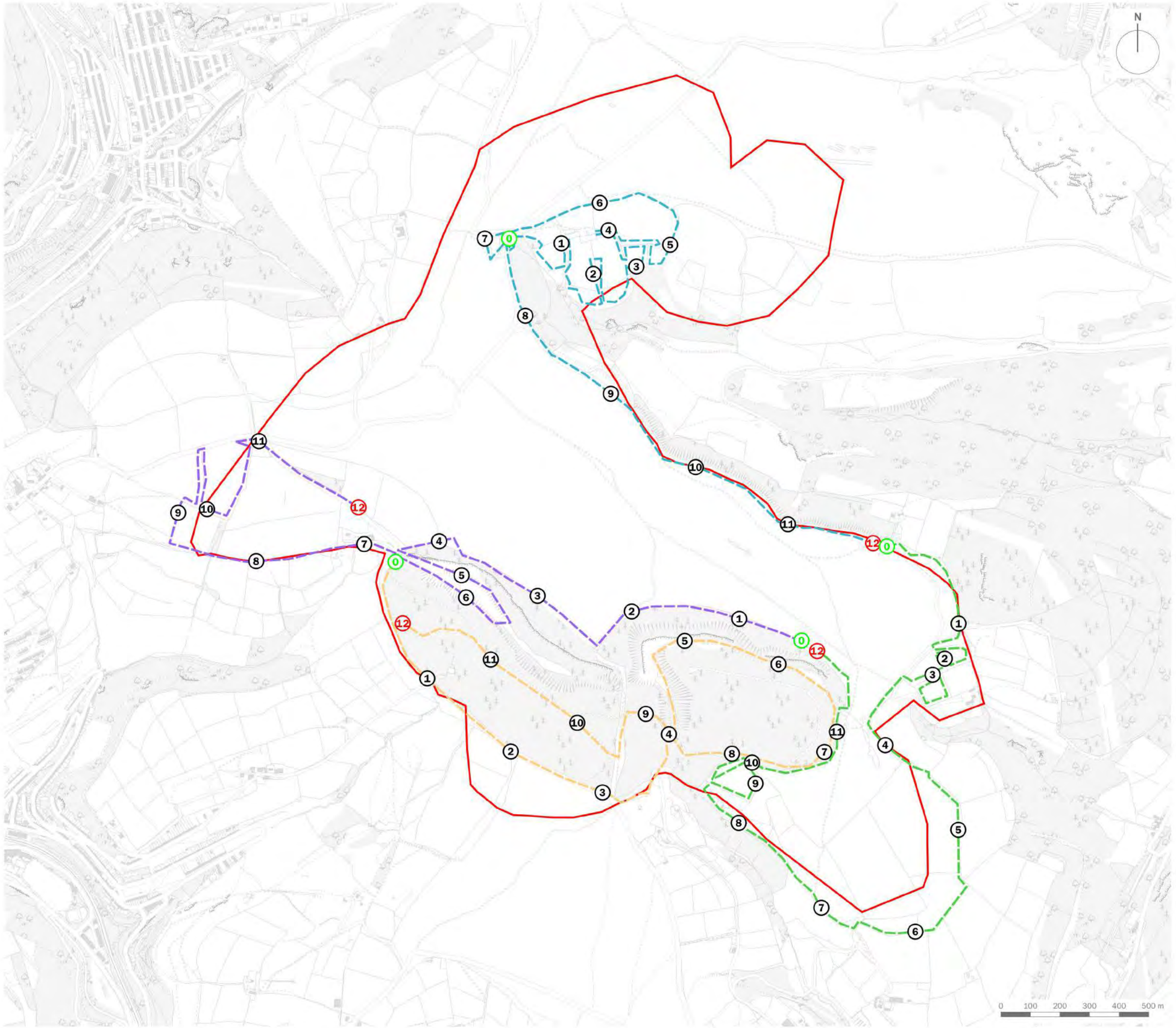
Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk



Survey Boundary

Bat Transect Routes

Northern Transect (6,864m)

Woodland Transect (6,548m)

Southern Transect (7,732m)

Pacing Point

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Bat Transect Routes
(Sheet 2 of 2 - June-October 2020)

date	13 MAY 2021	drawn by	MJC
drawing number	edp6367_d009a	checked	KH
scale	1:12,500 @ A3	QA	GY

the environmental dimension partnership

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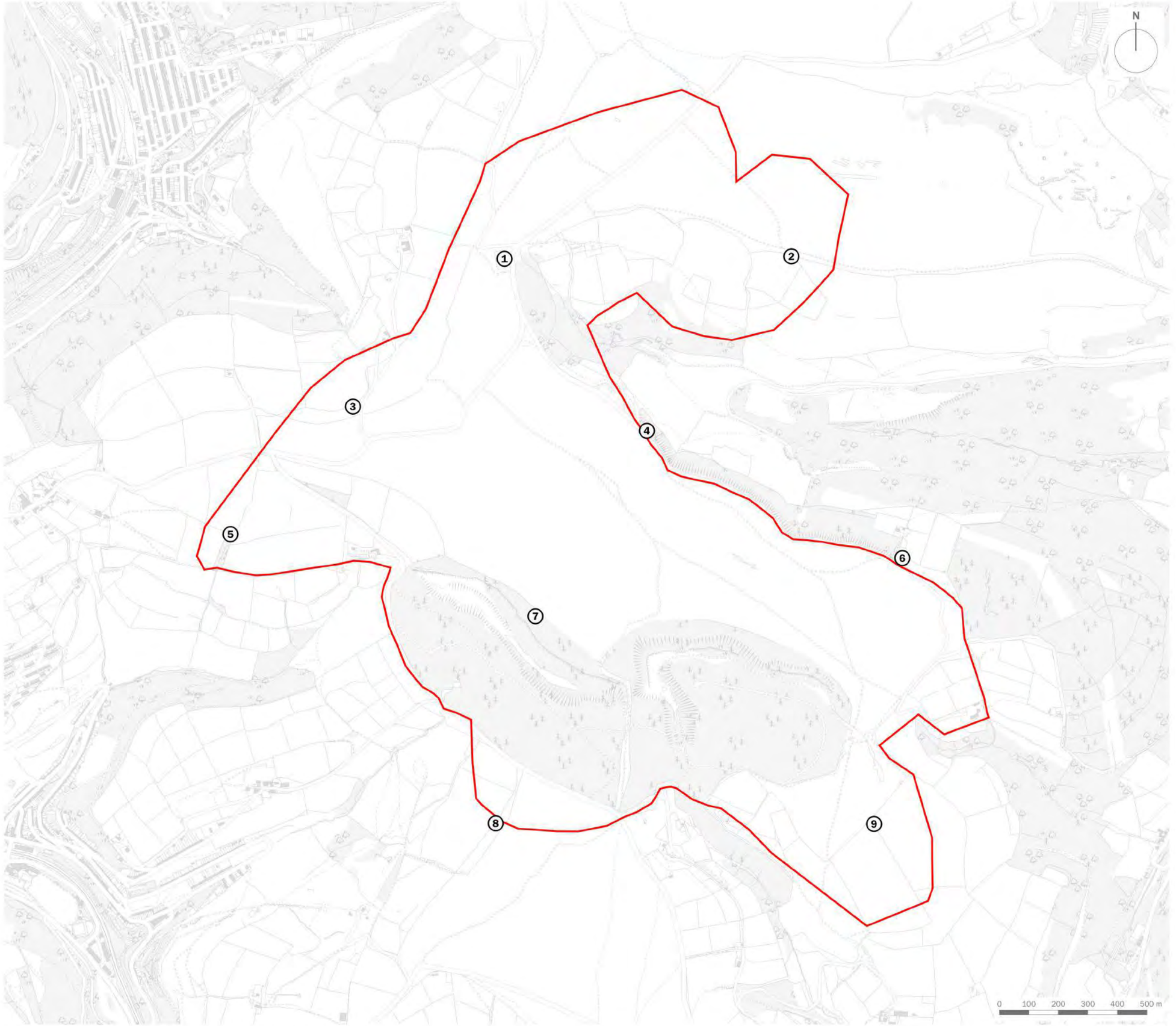
Appendix 5.7: Anabat Swift Locations (edp6367_d006a 12 May 2021 MJC/LL)



Survey Boundary

① Anabat Swift Locations

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Anabat Swift Locations

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d006a**	checked	**LL**
scale	**1:12,500 @ A3**	QA	**GY**

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Appendix 5.8: Bat Activity Survey Data, May – October 2020

Annex 5.8

Bat Activity Surveys – Walked Transect Surveys, 2020

Table 5.8.1: Survey Dates, Times and Weather Conditions, May - October 2020.

Survey date	Dusk/ dawn	Survey time	Sunrise / sunset time	Weather conditions			
				Temp (ºC)	Cloud (%)	Rain	Wind (Beaufort scale)
05.05.20	Dusk	20:34 – 23:44	20:34	17.0-15.0	5-80	Nil	1-2
02.06.20	Dusk	21:23 – 00:23	21:23	18.0-19.0	80-100	Nil	2-4
09.07.20	Dusk	21:29 – 00:29	21:29	11.0-14.0	70-90	Nil	2-3
24.08.20	Dusk	20:16 – 23:16	20:16	15.0-16.0	100	Nil to light drizzle	1-2
10.09.20	Dusk	19:44 – 22:44	19:44	11.0-13.0	80	Nil	1-2
14.10.20	Dusk	18:20 – 21:20	18:20	8.0-11.0	40-60	Nil	2-4

Table 5.8.2: Manual Transect Survey Results May 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		May		
Northeast Farmland	Common pipistrelle	26	26	**100**
	Total	26	26	**100**
Southeast Farmland	Common pipistrelle	66	66	**89.2**
	Long-eared sp.	1	1	**1.4**
	Lesser Horseshoe	4	4	**5.4**
	Noctule	2	2	**2.7**
	Soprano pipistrelle	1	1	**1.4**
	Total	74	74	**100**
Woodland Northern Edge	Common pipistrelle	111	111	**100**
	Total	111	111	**100**
Woodland Southern Edge	Common pipistrelle	255	255	**97.0**
	Lesser Horseshoe	3	3	**1.1**
	Myotis sp.	5	5	**1.9**
	Total	263	263	**100**

Table 5.8.3: Manual Transect Survey Results June 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		June		
Northern	Common pipistrelle	209	209	**95.9**
	Long-eared sp.	2	2	**0.9**
	Soprano pipistrelle	7	7	**3.2**
	Total	218	218	**100**
Woodland	Common pipistrelle	333	333	**99.1**
	Myotis sp.	1	1	**0.3**
	Noctule	2	2	**0.6**
	Total	336	336	**100**
Southern	Common pipistrelle	177	177	**94.7**
	Lesser Horseshoe	1	1	**0.5**
	Myotis sp.	3	3	**1.6**
	Noctule	2	2	**1.1**
	Soprano pipistrelle	4	4	**2.1**
	Total	187	187	**100**

Table 5.8.4: Manual Transect Survey Results July 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		July		
Northern	Common pipistrelle	144	144	**100**
	Total	144	144	**100**
Woodland	Common pipistrelle	188	188	**90.8**
	Myotis sp.	19	19	**9.2**
	Total	207	207	**100**
Southern	Common pipistrelle	91	91	**95.8**
	Myotis sp.	3	3	**3.2**
	Noctule	1	1	**1**
	Total	95	95	**100**

Table 5.8.5: Manual Transect Survey Results August 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		August		
Northern	Common pipistrelle	245	245	**97.2**
	Myotis sp.	7	7	**2.8**
	Total	252	252	**100**
Woodland	Common pipistrelle	183	183	**87.2**
	Long-eared sp.	1	1	**0.6**
	Myotis sp.	1	1	**0.6**
	Noctule	16	16	**7.1**
	Serotine	4	4	**2**
	Soprano pipistrelle	5	5	**2.5**
	Total	210	210	**100**
Southern	Common pipistrelle	421	421	**94**
	Lesser Horseshoe	1	1	**0.2**
	Long-eared sp.	7	7	**1.6**
	Myotis sp.	15	15	**3.3**
	Soprano pipistrelle	4	4	**0.9**
	Total	448	448	**100**

Table 5.8.6: Manual Transect Survey Results September 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		September		
Northern	Common pipistrelle	100	100	**98**
	Long-eared sp.	1	1	**1**
	Soprano pipistrelle	1	1	**1**
	Total	102	102	**100**
Woodland	Common pipistrelle	314	314	**98.4**
	Long-eared sp.	2	2	**0.6**
	Soprano pipistrelle	3	3	**0.9**
	Total	319	319	**100**
Southern	Common pipistrelle	204	204	**97.1**
	Greater Horseshoe	1	1	**0.5**
	Long-eared sp.	2	2	**1**
	Soprano pipistrelle	3	3	**1.4**
	Total	210	210	**100**

Table 5.8.7: Manual Transect Survey Results October 2020.

Transect Route	Bat Species	Number of Bat Passes Recorded per Manual Transect Survey	Total	% of Total
		October		
Northern	Common pipistrelle	3	3	**60**
	Soprano pipistrelle	2	2	**40**
	Total	5	5	**100**
Woodland	Common pipistrelle	9	9	**90**
	Noctule	1	1	**10**
	Total	10	10	**100**
Southern	Common pipistrelle	2	2	**100**
	Total	2	2	**100**

** Woodland and southern transects based on paper results only as batlogger data unknown

Bat Activity Surveys – Automated Static Detector Surveys, 2020

Table 5.8.8: Static Detector Deployment Locations, May - October 2020.

Sampling Period	Anabat ID	Location Description	Adjacent/Nearby Habitat	Microphone		
				Ht (m)	Direction	Sensitivity
May 05.05.20 – 15.05.20 *18.05.20 – 28.05.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	1.75	W	14
	2	Wide, mature beech near a field gate	Sheep grazing grassland field	1.75	W	14
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	2.0	S	14
	4	In a pine tree behind the field fence	Trees and scrub	1.0	E	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14
	6	Within the third fir tree along a fence line near the corner of a field	Sheep grazing grassland field	1.5	S	14
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8*	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.0	N	14
June 02.06.20 – 12.06.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	1.5	W	14
	2	Wide, mature beech near a field gate	Sheep grazing grassland field	1.5	SW	14
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	1.75	E	14
	4	In a pine tree behind the field fence	Trees and scrub	1.0	E	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14
	6	Within the third fir tree along a fence line	Sheep grazing grassland field	1.5	SW	14

Sampling Period	Anabat ID	Location Description	Adjacent/Nearby Habitat	Microphone		
				Ht (m)	Direction	Sensitivity
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.5	N	14
July 30.06.20 – 10.07.20 *21.07.20 – 31.07.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	1.5	W	14
	2*	Wide, mature beech near a field gate	Sheep grazing grassland field	1.5	SW	N/A
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	1.75	E	14
	4	In a pine tree behind the field fence	Trees and scrub	1.0	E	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14
	6	Within the third fir tree along a fence line near the corner of a field	Sheep grazing grassland field	1.5	SW	14
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.5	N	14
August 03.08.20 – 13.08.20 * 14.08.20 – 24.08.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	2.0	W	14
	2	Wide, mature beech near a field gate	Sheep grazing grassland field	2.0	SW	14
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	1.5	SE	14
	4*	In a pine tree behind the field fence	Trees and scrub	1.5	NE	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14
	6	Within the third fir tree along a fence	Sheep grazing grassland field	2.0	N	14

Sampling Period	Anabat ID	Location Description	Adjacent/Nearby Habitat	Microphone		
				Ht (m)	Direction	Sensitivity
		line near the corner of a field				
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.5	N	14
September 01.09.20 – 11.09.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	2.0	W	14
	2	Wide, mature beech near a field gate	Sheep grazing grassland field	2.0	SW	14
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	1.5	SE	14
	4	In a pine tree behind the field fence	Trees and scrub	1.5	NE	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14
	6	Within the third fir tree along a fence line near the corner of a field	Sheep grazing grassland field	2.0	N	14
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.5	N	14
October 01.10.20 – 13.10.20	1	Mature, multi-stemmed sycamore by a road	Trees and grassland	1.5	N	14
	2	Wide, mature beech near a field gate	Sheep grazing grassland field	2.0	S	14
	3	In a hawthorn immediately behind a field fence line	Sheep grazing grassland field	1.8	S	14
	4	In a pine tree behind the field fence	Trees and scrub	1.5	SE	14
	5	Within a beech tree along a fence line	Sheep grazing grassland field	2.0	NE	14

Sampling Period	Anabat ID	Location Description	Adjacent/Nearby Habitat	Microphone		
				Ht (m)	Direction	Sensitivity
	6	Within the third fir tree along a fence line near the corner of a field	Sheep grazing grassland field	1.5	SE	14
	7	Beside a forest edge in a clearing within a spruce	Forest clearing with fallen trees	1.0	NW	14
	8	In a mature beech along a fence line	Sheep grazing grassland field	2.0	SE	14
	9	In a hawthorn hedge	Sheep grazing grassland field	1.5	N	14

Table 5.8.9: Automated Detector Survey Results May 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		05 May	06 May	07 May	08 May	09 May	10 May	11 May	12 May	13 May	14 May		
1	Common pipistrelle	4	744	25	16	6	0	0	0	0	0	795	**99.4**
	Myotis sp.	1	0	0	1	0	0	0	0	0	0	2	**0.3**
	Noctule	0	0	0	1	1	0	0	0	0	0	2	**0.3**
	Serotine	0	0	1	0	0	0	0	0	0	0	1	**0.1**
	Total	5	744	26	18	7	0	0	0	0	0	800	**100**
2	Common pipistrelle	0	2	7	7	2	0	0	0	0	0	18	**90.0**
	Long-eared sp.	0	0	0	1	0	0	0	0	0	0	1	**5.0**
	Lesser Horseshoe	0	1	0	0	0	0	0	0	0	0	1	**5.0**
	Total	0	3	7	8	2	0	0	0	0	0	20	**100**
3	Common pipistrelle	0	21	73	210	69	0	0	0	0	0	373	**99.7**
	Myotis sp.	1	0	0	0	0	0	0	0	0	0	1	**0.3**
	Total	1	21	73	210	69	0	0	0	0	0	374	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		05 May	06 May	07 May	08 May	09 May	10 May	11 May	12 May	13 May	14 May		
4	Common pipistrelle	410	895	163	1999	622	0	0	2	0	134	4225	**99.6**
	Myotis sp.	0	0	0	2	1	0	0	0	0	0	3	**0.1**
	Noctule	0	0	0	11	1	0	0	0	0	0	12	**0.3**
	Soprano pipistrelle	0	0	0	1	0	0	0	0	0	0	1	**<0.1**
	Serotine	0	0	0	1	1	0	0	0	0	0	2	**<0.1**
	Total	410	895	163	2014	625	0	0	2	0	134	4243	**100**
5	Common pipistrelle	0	0	25	0	1	0	0	0	0	0	26	**96.3**
	Noctule	0	0	1	0	0	0	0	0	0	0	1	**3.7**
	Total	0	0	26	0	1	0	0	0	0	0	27	**100**
6	Common pipistrelle	128	202	36	92	89	0	0	37	0	52	636	**98.5**
	Lesser Horseshoe	1	3	0	0	0	0	0	0	0	0	4	**0.6**
	Myotis sp.	1	0	0	0	0	0	0	0	0	0	1	**0.2**
	Noctule	0	0	0	0	4	0	0	0	0	1	5	**0.8**
	Total	130	205	36	92	93	0	0	37	0	53	646	**100**
7	Common pipistrelle	0	0	73	25	52	0	0	0	0	0	150	**97.4**
	Myotis sp.	0	0	0	0	1	0	0	0	0	0	1	**0.6**
	Noctule	0	0	3	0	0	0	0	0	0	0	3	**1.9**
	Total	0	0	76	25	53	0	0	0	0	0	154	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		18 May	19 May	20 May	21 May	22 May	23 May	24 May	25 May	26 May	27 May		
8*	Common pipistrelle	480	460	361	55	0	46	193	141	85	27	1848	**99.8**
	Noctule	0	2	0	0	0	0	0	1	0	1	4	**0.2**
	Total	480	462	361	55	0	46	193	142	85	28	1852	**100**

*Different dates for location 8 above as redeployed at a later date.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		05 May	06 May	07 May	08 May	09 May	10 May	11 May	12 May	13 May	14 May		
9	Common pipistrelle	0	22	190	234	0	0	0	0	0	0	446	**98.9**
	Myotis sp.	0	0	0	0	1	0	0	0	0	0	1	**0.2**
	Noctule	0	0	1	1	0	0	2	0	0	0	4	**0.9**
	Total	0	22	191	235	1	0	2	0	0	0	451	**100**

Table 5.8.10: Automated Detector Survey Results June 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 June	03 June	04 June	05 June	06 June	07 June	08 June	09 June	10 June	11 June		
1	Common pipistrelle	547	0	26	0	4	30	63	65	0	0	735	**98.7**
	Myotis sp.	5	0	0	0	0	0	1	1	0	0	7	**0.9**
	Noctule	1	0	0	0	0	0	0	0	0	0	1	**0.1**
	Soprano pipistrelle	2	0	0	0	0	0	0	0	0	0	2	**0.3**
	Total	555	0	26	0	4	30	64	66	0	0	745	**100.0**
2	Common pipistrelle	0	0	3	0	4	3	4	21	0	0	35	**87.5**
	Myotis sp.	0	0	0	0	0	0	2	0	0	0	2	**5.0**
	Noctule	0	0	3	0	0	0	0	0	0	0	3	**7.5**
	Total	0	0	6	0	4	3	6	21	0	0	40	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 June	03 June	04 June	05 June	06 June	07 June	08 June	09 June	10 June	11 June		
3	Common pipistrelle	4	0	0	0	0	1	1	1	0	0	7	**53.8**
	Long-eared Sp.	0	0	0	0	0	0	1	0	0	0	1	**7.7**
	Myotis Sp.	0	0	0	0	0	1	0	0	0	0	1	**7.7**
	Noctule	0	0	0	4	0	0	0	0	0	0	4	**30.8**
	Total	4	0	0	4	0	2	2	1	0	0	13	**100**
4	Common pipistrelle	1229	0	61	0	0	130	3	55	0	0	1478	**95.8**
	Long-eared Sp.	1	0	0	0	0	1	0	0	0	0	2	**0.1**
	Lesser Horseshoe	2	0	0	0	0	0	0	1	0	0	3	**0.2**
	Myotis Sp.	5	0	0	0	0	2	1	0	0	0	8	**0.5**
	Soprano pipistrelle	10	0	0	0	0	26	0	16	0	0	52	**3.4**
	Total	1247	0	61	0	0	159	4	72	0	0	1543	**100**
5	Common pipistrelle	510	1	31	0	8	7	177	130	0	0	864	**77.1**
	Myotis Sp.	3	0	0	0	0	0	1	0	0	0	4	**0.4**
	Nathusius' pipistrelle	1	0	0	0	0	0	0	1	0	0	2	**0.2**
	Noctule	93	3	42	9	0	6	12	83	0	0	248	**22.1**
	Soprano pipistrelle	1	0	0	0	1	0	0	0	0	0	2	**0.2**
	Total	608	4	73	9	9	13	190	214	0	0	1120	**100**
6	Common pipistrelle	50	0	55	1	0	18	10	154	0	1	289	**96.7**
	Lesser Horseshoe	1	0	0	0	0	0	0	0	0	0	1	**0.3**
	Myotis Sp.	1	0	0	0	0	1	0	2	0	0	4	**1.3**
	Noctule	1	0	0	0	0	0	1	0	0	0	2	**0.7**
	Soprano pipistrelle	0	0	2	0	0		0	0	0	0	2	**0.7**
	Serotine	1	0	0	0	0	0	0	0	0	0	1	**0.3**
	Total	54	0	57	1	0	19	11	156	0	1	299	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 June	03 June	04 June	05 June	06 June	07 June	08 June	09 June	10 June	11 June		
7	Common pipistrelle	1	0	3	0	0	2	4	0	0	0	10	**83.3**
	Myotis sp.	0	0	0	0	0	0	0	2	0	0	2	**16.7**
	Total	1	0	3	0	0	2	4	2	0	0	12	**100**
8	Common pipistrelle	0	0	3	0	11	21	26	7	0	0	68	**100**
	Total	0	0	3	0	11	21	26	7	0	0	68	**100**
9	Common pipistrelle	802	0	10	0	0	77	4	13	0	10	916	**99.1**
	Myotis sp.	5	0	0	0	0	0	0	0	0	0	5	**0.5**
	Noctule	1	0	0	0	0	0	0	2	0	0	3	**0.3**
	Total	808	0	10	0	0	77	4	15	0	10	924	**100**

Table 5.8.11: Automated Detector Survey Results July 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		30 June	01 July	02 July	03 July	04 July	05 July	06 July	07 July	08 July	09 July		
1	Common pipistrelle	0	0	0	0	0	0	3	0	0	0	3	**100**
	Total	0	0	0	0	0	0	3	0	0	0	3	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		21 July	22 July	23 July	24 July	25 July	26 July	27 July	28 July	29 July	30 July		
2*	Common pipistrelle	3	6	3	0	14	0	3	1	83	55	168	**93.3**
	Long-eared sp.	2	0	0	0	0	0	0	0	0	0	2	**1.1**
	Myotis sp.	1	0	0	0	0	0	0	0	2	5	8	**4.4**
	Noctule	1	0	1	0	0	0	0	0	0	0	2	**1.1**
	Total	7	6	4	0	14	0	3	1	85	60	180	**100**

*Different dates for location 2 above as redeployed at a later date.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		30 June	01 July	02 July	03 July	04 July	05 July	06 July	07 July	08 July	09 July		
3	Common pipistrelle	10	23	21	0	0	0	56	0	0	0	110	**98.2**
	Lesser Horseshoe	0	0	0	0	0	0	1	0	0	0	1	**0.9**
	Myotis sp.	0	0	1	0	0	0	0	0	0	0	1	**0.9**
	Total	10	23	22	0	0	0	57	0	0	0	112	**100**
4	Common pipistrelle	1	3	0	0	0	0	0	0	0	0	4	**26.7**
	Myotis sp.	0	9	0	0	0	0	0	0	0	0	9	**60.0**
	Noctule	0	1	1	0	0	0	0	0	0	0	2	**13.3**
	Total	1	13	1	0	0	0	0	0	0	0	15	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		30 June	01 July	02 July	03 July	04 July	05 July	06 July	07 July	08 July	09 July		
5	Common pipistrelle	165	146	96	49	33	18	30	53	66	0	656	**99.7**
	Myotis sp.	0	0	0	1	0	0	1	0	0	0	2	**0.3**
	Total	165	146	96	50	33	18	31	53	66	0	658	**100**
6	Common pipistrelle	16	12	20	0	0	1	58	0	0	0	107	**100**
	Total	16	12	20	0	0	1	58	0	0	0	107	**100**
7	Common pipistrelle	0	0	4	0	0	1	7	0	0	0	12	**80.0**
	Myotis sp.	0	0	0	0	0	1	2	0	0	0	3	**20.0**
	Total	0	0	4	0	0	2	9	0	0	0	15	**100**
8	Common pipistrelle	75	49	125	0	0	1	388	0	72	0	710	**95.6**
	Greater Horseshoe	0	0	0	0	0	1	0	0	0	0	1	**0.1**
	Myotis sp.	2	12	2	0	0	0	10	0	0	0	26	**3.5**
	Noctule	4	0	0	0	0	0	2	0	0	0	6	**0.8**
	Total	81	61	127	0	0	2	400	0	72	0	743	**100**
9	Common pipistrelle	0	1	0	0	0	0	2	3	0	0	6	**60.0**
	Myotis sp.	1	0	0	0	0	0	0	3	0	0	4	**40.0**
	Total	1	1	0	0	0	0	2	6	0	0	10	**100**

Table 5.8.12: Automated Detector Survey Results, August 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 Aug	03 Aug	04 Aug	05 Aug	06 Aug	07 Aug	08 Aug	09 Aug	10 Aug	11 Aug		
1	Common pipistrelle	0	0	0	0	0	0	0	0	0	2	2	**28.6**
	Myotis sp.	0	0	0	0	0	0	0	0	0	1	1	**14.3**
	Noctule	0	0	0	0	0	1	0	1	0	2	4	**57.1**
	Total	0	0	0	0	0	1	0	1	0	5	7	**100**
2	Common pipistrelle	0	0	0	0	99	8	1	6	20	20	154	**73.7**
	Myotis sp.	0	0	0	0	0	3	1	1	4	6	16	**7.7**
	Noctule	0	2	0	0	0	1	1		1	1	6	**2.9**
	Big Bat sp.	0	0	0	0	0	2	1	1	1	5	10	**4.8**
	Soprano pipistrelle	0	0	0	0	0	6	3	1	4	4	18	**8.6**
	Serotine	0	0	0	0	1	0	2		1	1	5	**2.4**
	Total	0	2	0	0	100	20	9	9	31	37	209	**100**
3	Common pipistrelle	0	33	0	7	143	316	8	391	826	157	1881	**91.5**
	Greater Horseshoe	0	0	0	0	3	0	0	0	0	0	3	**0.1**
	Long-eared Sp.	0	0	0	0	3	19	0	1	4	1	28	**1.4**
	Myotis Sp.	0	4	0	3	20	30	4	12	19	14	106	**5.2**
	Noctule	0	0	1	0	1	0	1	0	3	2	8	**0.4**
	Big Bat sp.	0	0	0	0	0	2	0	0	0	0	2	**0.1**
	Soprano pipistrelle	0	1	0	0	3	7	3	4	3	4	25	**1.2**
	Serotine	0	0	0	0	0	0	0	1	0	2	3	**0.1**
	Total	0	38	1	10	173	374	16	409	855	180	2056	**100**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		14 Aug	15 Aug	16 Aug	17 Aug	18 Aug	19 Aug	20 Aug	21 Aug	22 Aug	23 Aug		
4*	Common pipistrelle	1077	224	705	17	472	5	53	0	0	4	2557	**98.4**
	Lesser Horseshoe	0	0	1	0	0	0	0	0	0	0	1	**<0.1**
	Myotis sp.	2	0	5	0	4	0	0	0	0	0	11	**0.4**
	Noctule	5	0	7	2	5	3	0	0	0	5	27	**1.0**
	Soprano pipistrelle	0	0	0	0	1	0	0	0	0	0	1	**<0.1**
	Serotine	0	0	1	0	0	0	0	0	0	0	1	**<0.1**
	Total	1084	224	719	19	482	8	53	0	0	9	2598	**100**

*Different dates for location 4 above as redeployed at a later date.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 Aug	03 Aug	04 Aug	05 Aug	06 Aug	07 Aug	08 Aug	09 Aug	10 Aug	11 Aug		
5	Common pipistrelle	0	54	36	59	201	39	0	20	53	18	480	**94.3**
	Long-eared sp.	0	0	0	0	1	0	0	0	0	0	1	**0.2**
	Myotis sp.	0	0	0	2	7	3	2	0	3	1	18	**3.5**
	Soprano pipistrelle	0	0	0	0	1	1	0	2	0	3	7	**1.4**
	Serotine	0	0	0	0	0	0	0	0	1	2	3	**0.6**
	Total	0	54	36	61	210	43	2	22	57	24	509	**100**
6	Common pipistrelle	0	141	2	0	17	249	47	254	89	78	877	**95.7**
	Long-eared sp.	0	0	0	0	0	0	0	0	1	0	1	**0.1**
	Myotis sp.	0	0	0	1	2	5	0	0	2	5	15	**1.6**
	Noctule	0	0	2	0	0	1	1	0	2	0	6	**0.7**
	Big Bat sp.	0	0	0	0	0	0	0	0	1	0	1	**0.1**
	Soprano pipistrelle	0	0	0	0	2	8	1	3	1	1	16	**1.7**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 Aug	03 Aug	04 Aug	05 Aug	06 Aug	07 Aug	08 Aug	09 Aug	10 Aug	11 Aug		
	Total	0	141	4	1	21	263	49	257	96	84	916	**100**
7	Common pipistrelle	0	14	0	0	9	32	6	48	61	54	224	**65.1**
	Greater Horseshoe	0	0	0	0	1	0	0	1	1	0	3	**0.9**
	Long-eared sp.	0	0	0	0	1	0	0	0	0	0	1	**0.3**
	Lesser Horseshoe	0	0	0	0	0	1	0	0	0	0	1	**0.3**
	Myotis sp.	0	2	0	0	4	3	2	0	2	3	16	**4.7**
	Noctule	0	0	0	0	10	12	4	18	13	17	74	**21.5**
	Soprano pipistrelle	0	0	0	0	0	3	2	3	7	3	18	**5.2**
	Serotine	0	1	0	0	0	1	1	0	2	2	7	**2.0**
	Total	0	17	0	0	25	52	15	70	86	79	344	**100**
8	Common pipistrelle	0	261	5	45	124	516	0	98	539	72	1660	**87.9**
	Greater Horseshoe	0	0	0	0	1	0	0	0	0	0	1	**0.1**
	Myotis sp.	0	66	0	20	4	34	0	3	10	0	137	**7.3**
	Noctule	0	0	1	1	2	5	2	2	33	9	55	**2.9**
	Big Bat sp.	0	0	0	0	2	0	0	0	1	0	3	**0.2**
	Soprano pipistrelle	0	0	0	1	1	0	0	0	3	5	10	**0.5**
	Serotine	0	0	0	0	0	1	0	0	22	0	23	**1.2**
	Total	0	327	6	67	134	556	2	103	608	86	1889	**100**
9	Common pipistrelle	0	1	1	1	404	510	9	362	703	846	2837	**93.4**
	Great Horseshoe	0	0	0	0	0	0	0	0	1	0	1	**<0.1**
	Long-eared sp.	0	0	0	0	0	1	0	2	1	0	4	**0.1**
	Myotis sp.	0	1	2	0	2	5	0	4	60	38	112	**3.7**
	Noctule	0	0	0	0	0	0	0	0	0	1	1	**<0.1**
	Big Bat sp.	0	0	0	0	0	1	0	0	0	0	1	**<0.1**
	Soprano pipistrelle	0	0	0	0	10	9	1	7	24	27	78	**2.6**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		02 Aug	03 Aug	04 Aug	05 Aug	06 Aug	07 Aug	08 Aug	09 Aug	10 Aug	11 Aug		
	Serotine	0	0	0	0	0	0	0	1		1	2	**0.1**
	Total	0	2	3	1	416	526	10	376	789	913	3036	**100**

Table 5.8.13: Automated Detector Survey Results, September 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Sept	02 Sept	03 Sept	04 Sept	05 Sept	06 Sept	07 Sept	08 Sept	09 Sept	10 Sept		
1	Common pipistrelle	0	0	3	0	7	0	0	0	0	6	16	**88.9**
	Noctule	1	0	0	0	0	0	0	0	0	1	2	**11.1**
	Total	1	0	3	0	7	0	0	0	0	7	18	**100**
2	Common pipistrelle	134	0	0	2	0	5	0	10	2	37	190	**85.2**
	Greater Horseshoe	0	0	0	0	0	0	0	0	0	2	2	**0.9**
	Long-eared sp.	0	0	0	0	1	0	0	0	0	0	1	**0.4**
	Lesser Horseshoe	0	0	0	0	0	0	0	0	0	1	1	**0.4**
	Myotis sp.	1	0	0	3	2	0	0	1	2	0	9	**4.0**
	Noctule	0	0	0	0	2	0	0	0	0	0	2	**0.9**
	Big Bat sp.	5	1	1	0	0	3	0	0	0	4	14	**6.3**
	Soprano pipistrelle	1	0	0	0	0	0	0	0	2	1	4	**1.8**
	Total	141	1	1	5	5	8	0	11	6	45	223	**100**
3	Common pipistrelle	151	9	145	7	57	259	16	645	15	133	1437	**96.3**
	Greater Horseshoe	0	0	0	0	1	0	0	0	1	0	2	**0.1**
	Long-eared Sp.	0	0	0	0	0	0	2	2	1	0	5	**0.3**
	Myotis Sp.	3	1	0	0	3	9	6	5	4	3	34	**2.3**
	Nathusius pipistrelle	0	0	0	0	0	0	0	2	0	0	2	**0.1**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Sept	02 Sept	03 Sept	04 Sept	05 Sept	06 Sept	07 Sept	08 Sept	09 Sept	10 Sept		
	Soprano pipistrelle	1	0	5	0	1	0	0	3	0	2	12	**0.8**
	Total	155	10	150	7	62	268	24	657	21	138	1492	**100**
4	Common pipistrelle	8	1	0	0	0	110	0	8	218	16	361	**92.3**
	Greater Horseshoe	1	0	0	0	0	0	0	0	0	0	1	**0.3**
	Long-eared sp.	0	0	0	1	0	0	0	0	0	0	1	**0.3**
	Lesser Horseshoe	0	0	0	0	0	1	0	0	0	0	1	**0.3**
	Myotis sp.	0	0	0	0	0	5	0	0	4	2	11	**2.8**
	Noctule	1	0	0	0	0	1	0	1	1	1	5	**1.3**
	Big Bat sp.	1	0	0	0	0	1	0	0	2	4	8	**2.0**
	Soprano pipistrelle	0	0	1	0	0	0	0	0	1	0	2	**0.5**
	Serotine	0	0	0	0	0	1	0	0	0	0	1	**0.3**
	Total	11	1	1	1	0	119	0	9	226	23	391	**100**
5	Common pipistrelle	103	208	130	40	59	44	122	215	9	91	1021	**82.3**
	Long-eared sp.	0	0	1	0	0	0	1	3	0	0	5	**0.4**
	Lesser Horseshoe	4	0	18	1	2	0	0	49	0	5	79	**6.4**
	Myotis sp.	3	0	25	0	0	0	43	32	0	10	113	**9.1**
	Noctule	0	0	0	0	0	1	1	3	1	3	9	**0.7**
	Big Bat sp.	0	2	0	0	1	0	2	2	0	0	7	**0.6**
	Soprano pipistrelle	0	0	1	0	0	0	2	2	0	0	5	**0.4**
	Serotine	1	0	0	0	0	0	0	0	0	0	1	**0.1**
	Total	111	210	175	41	62	45	171	306	10	109	1240	**100**
6	Common pipistrelle	19	0	0	0	0	140	32	14	100	54	359	**92.3**
	Greater Horseshoe	0	0	0	0	1	0	0	0	4	0	5	**1.3**
	Long-eared sp.	0	0	0	0	0	1	0	0	0	0	1	**0.3**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Sept	02 Sept	03 Sept	04 Sept	05 Sept	06 Sept	07 Sept	08 Sept	09 Sept	10 Sept		
	Lesser Horseshoe	1	0	0	0	0	2	0	0	2	1	6	**1.5**
	Noctule	0	0	0	0	0	0	0	0	1	0	1	**0.3**
	Big Bat sp.	0	0	0	0	0	7	0	1	2	1	11	**2.8**
	Soprano pipistrelle	1	0	0	0	0	2	0	0	2	1	6	**1.5**
	Total	21	0	0	0	1	152	32	15	111	57	389	**100**
7	Common pipistrelle	20	0	4	7	6	16	3	2	7	38	103	**68.7**
	Lesser Horseshoe	0	0	0	0	0	1	0	0	1	0	2	**1.3**
	Myotis sp.	1	0	1	2	1	1	1	0	2	0	9	**6.0**
	Noctule	2	1	5	0	0	1	1	8	0	1	19	**12.7**
	Big Bat sp.	1	0	1	1	0	5	0	0	1	1	10	**6.7**
	Soprano pipistrelle	1	0	1	0	0	0	0	0	1	1	4	**2.7**
	Serotine	0	0	0	0	0	2	0	0	0	1	3	**2.0**
	Total	25	1	12	10	7	26	5	10	12	42	150	**100**
8	Common pipistrelle	79	38	103	18	31	249	11	170	117	154	970	**92.5**
	Greater Horseshoe	0	0	1	1	0	2	0	0	0	0	4	**0.4**
	Lesser Horseshoe	0	0	0	0	0	1	0	0	1	0	2	**0.2**
	Myotis sp.	0	0	3	2	2	9	1	3	0	6	26	**2.5**
	Noctule	2	0	0	0	0	0	0	1	3	0	6	**0.6**
	Big Bat sp.	3	0	0	2	0	1	0	2	3	5	16	**1.5**
	Soprano pipistrelle	2	1	2	3	0	3	1	1	2	4	19	**1.8**
	Serotine	0	0	0	0	0	3	0	1	2	0	6	**0.6**
	Total	86	39	109	26	33	268	13	178	128	169	1049	**100**
9	Common pipistrelle	65	3	137	0	11	35	19	51	0	15	336	**92.3**
	Greater Horseshoe	1	0	2	0	0	0	0	0	0	0	3	**0.8**
	Myotis sp.	1	0	5	0	0	1	1	0	0	0	8	**2.2**

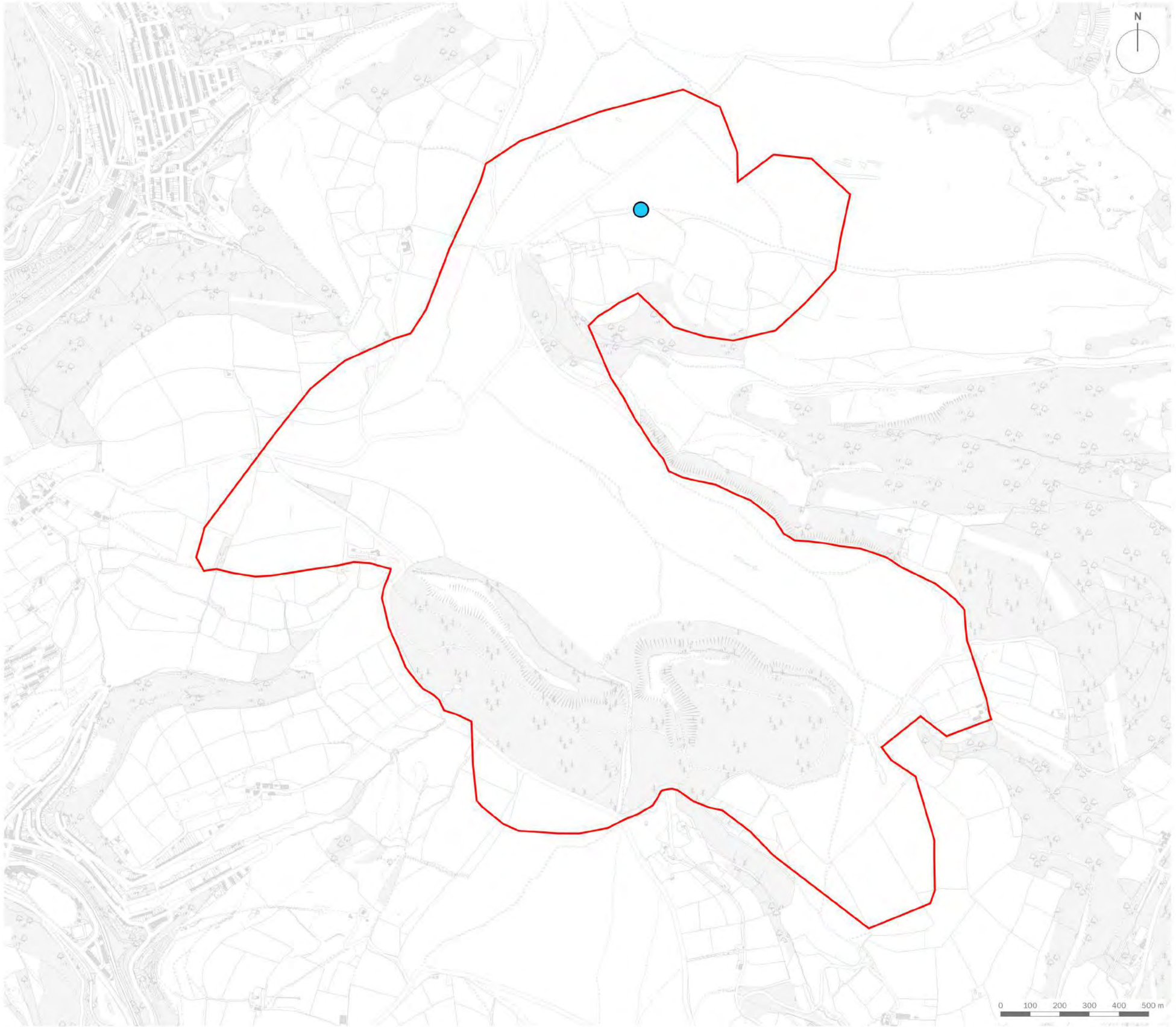
Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Sept	02 Sept	03 Sept	04 Sept	05 Sept	06 Sept	07 Sept	08 Sept	09 Sept	10 Sept		
	Big Bat sp.	0	0	0	0	0	0	1	0	0	0	1	**0.3**
	Soprano pipistrelle	4	2	0	0	0	0	1	3	0	6	16	**4.4**
	Total	71	5	144	0	11	36	22	54	0	21	364	**100**

Table 5.8.14: Automated Detector Survey Results, October 2020.

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Oct	02 Oct	03 Oct	04 Oct	05 Oct	06 Oct	07 Oct	08 Oct	09 Oct	10 Oct		
1	**Detector failure - no bats**												
2	Common pipistrelle	0	0	0	0	0	0	0	1	0	0	1	**100**
	Total	0	0	0	0	0	0	0	1	0	0	1	**100**
3	Common pipistrelle	0	0	0	1	4	0	0	101	0	2	108	**91.5**
	Lesser Horseshoe	0	0	0	0	0	0	0	1	0	0	1	**0.8**
	Myotis Sp.	0	0	0	1	0	0	0	2	0	4	7	**5.9**
	Noctule	0	0	0	0	0	0	0	1	0	0	1	**0.8**
	Big Bat sp.	0	0	0	0	0	0	0	1	0	0	1	**0.8**
	Total	0	0	0	2	4	0	0	106	0	6	118	**100**
4	Common pipistrelle	107	0	0	9	0	1	0	13	5	0	135	**89.4**
	Soprano pipistrelle	13	0	0	0	0	0	0	3	0	0	16	**10.6**
	Total	120	0	0	9	0	1	0	16	5	0	151	**100**
5	Common pipistrelle	0	0	0	0	8	5	0	13	0	0	26	**100**
	Total	0	0	0	0	8	5	0	13	0	0	26	**100**
6	Common pipistrelle	18	0	0	291	3	0	0	0	0	0	312	**100**
	Total	18	0	0	291	3	0	0	0	0	0	312	**100**
7	Common pipistrelle	0	0	0	0	0	0	0	3	0	0	3	**75**

Location	Bat Species	Number of Bat Passes Recorded per Night										Total	% of Total
		01 Oct	02 Oct	03 Oct	04 Oct	05 Oct	06 Oct	07 Oct	08 Oct	09 Oct	10 Oct		
	Soprano pipistrelle	0	0	0	0	0	0	0	1	0	0	1	**25**
	Total	0	0	0	0	0	0	0	4	0	0	4	**100**
8	Common pipistrelle	0	0	0	0	1	0	0	28	0	1	30	**76.9**
	Long-eared sp.	0	0	0	0	0	0	0	1	0	0	1	**2.6**
	Myotis sp.	0	0	0	0	0	0	0	2	0	4	6	**15.4**
	Soprano pipistrelle	0	0	0	0	0	0	0	2	0	0	2	**5.1**
	Total	0	0	0	0	1	0	0	33	0	5	39	**100**
9	Common pipistrelle	0	0	0	1	0	0	0	0	0	0	1	**33.3**
	Long-eared sp.	0	0	0	0	0	1	0	0	0	0	1	**33.3**
	Myotis sp.	0	0	0	0	0	0	0	0	0	1	1	**33.3**
	Total	0	0	0	1	0	0	0	0	0	0	3	**100**

Appendix 5.9: Weather Station Location (edp6367_d007a 12 May 2021 MJC/KH)



Survey Boundary

Weather Station Location

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Weather Station Location

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d007a**	checked	**KH**
scale	**1:12,500 @ A3**	QA	**GY**

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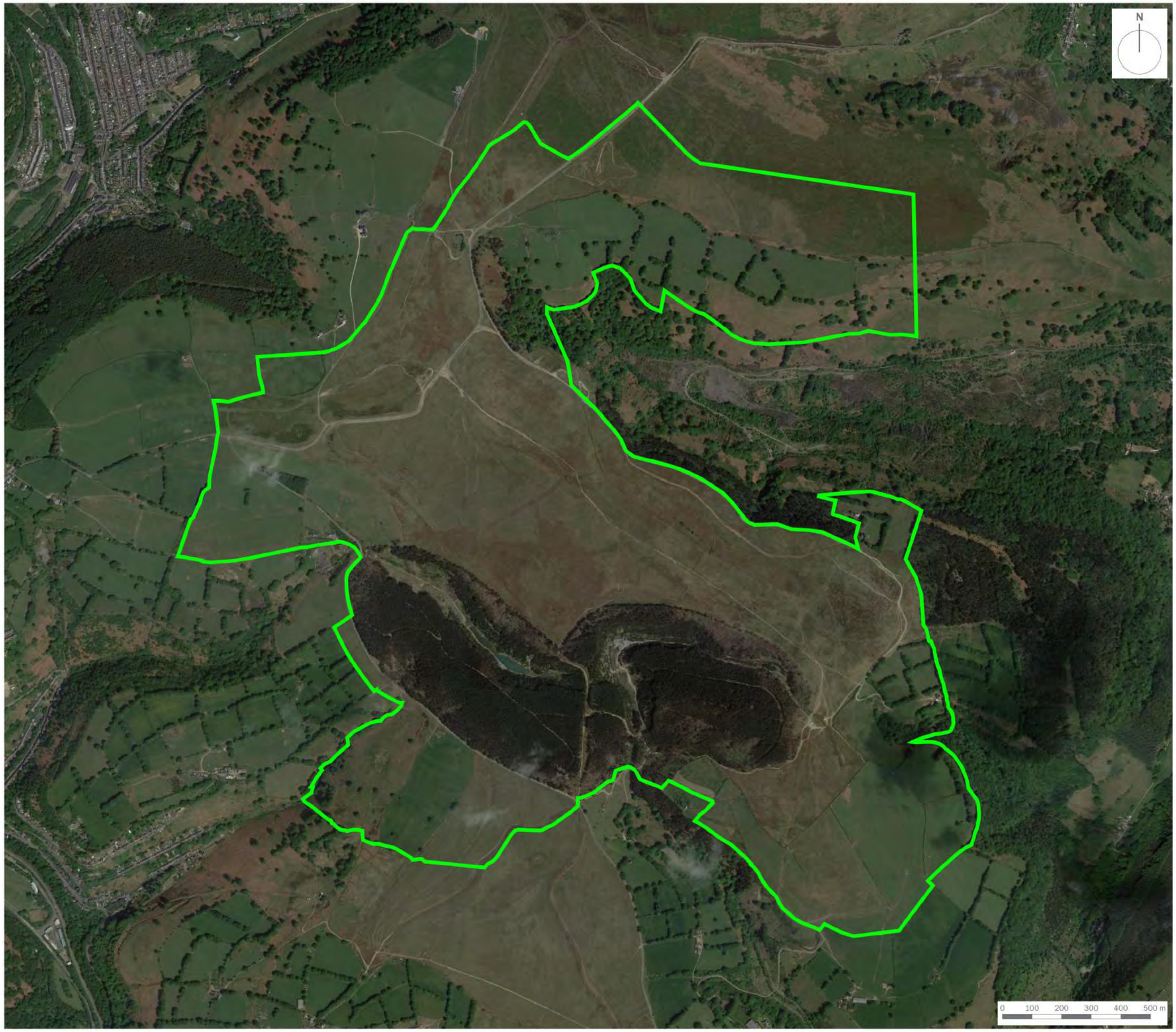
Appendix 5.10: Revised study area (edp6367_d038a 13 May 2021 MJC/KH);



Study Area - Revised

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Study Area - Revised

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d038a**	checked	**KH**
scale	**1:12,500 @ A3**	QA	**GY**

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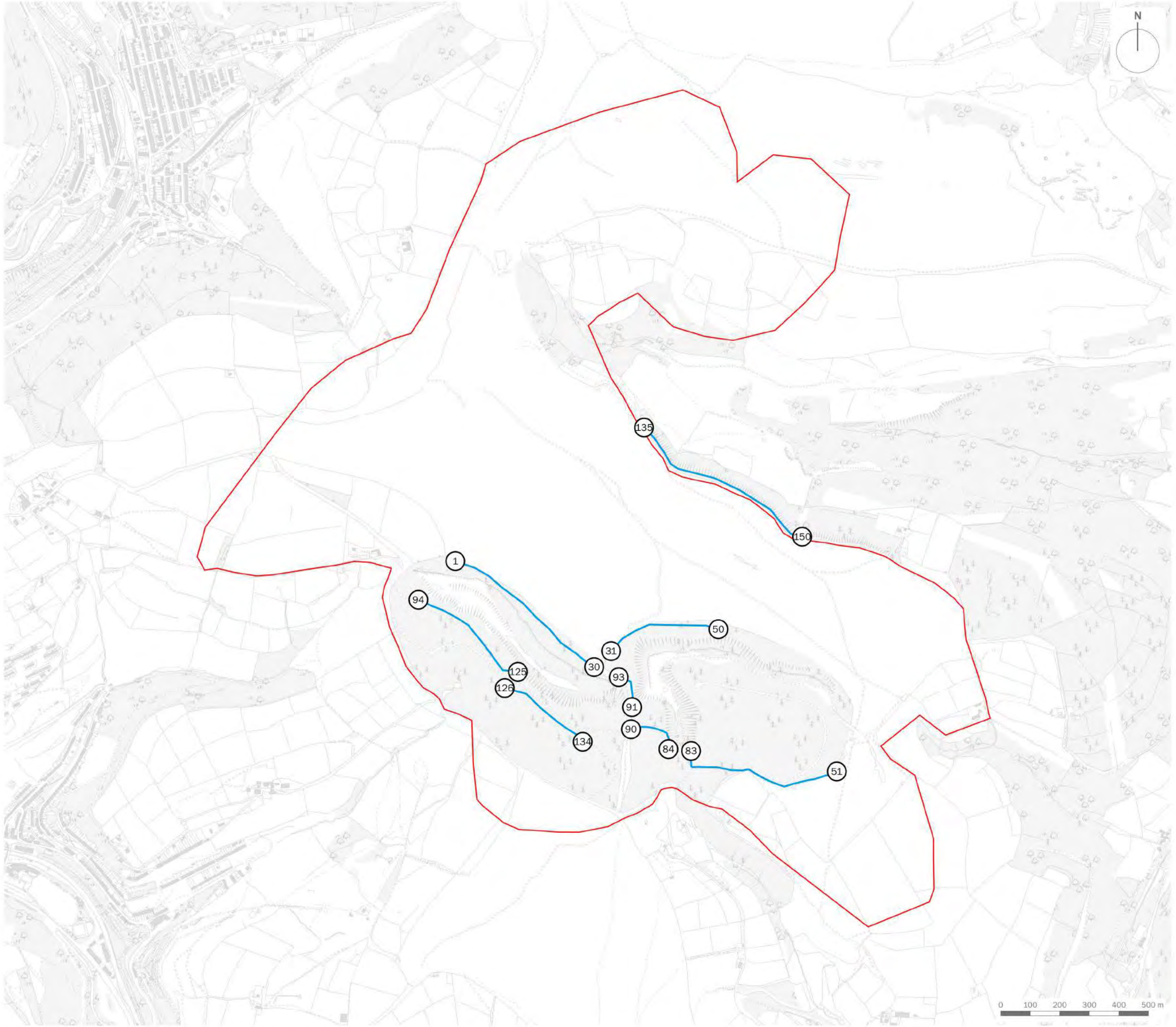
Appendix 5.11: Dormouse Tube Locations (edp6367_d004a 12 May 2021 MJC/EWi)



Survey Boundary

1 2 Dormouse Tube Locations and Numbers

client

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project title

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drawing title

Dormouse Tube Locations

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d004a**	checked	**EWI**
scale	**1:12,500 @ A3**	QA	**GY**

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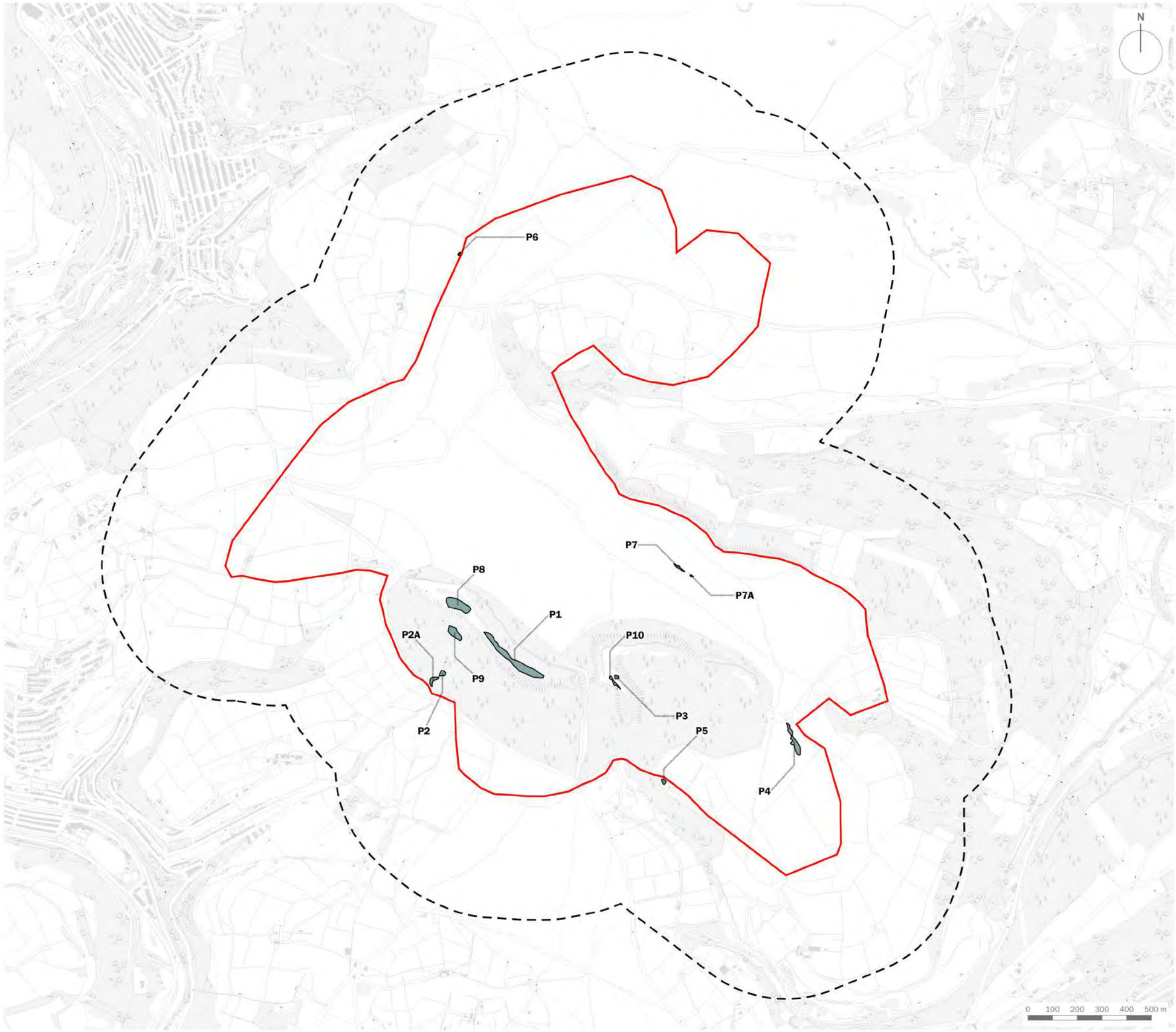
Appendix 5.12: Pond Locations within 500m (edp6367_d005a 12 May 2021 MJC/EMc)



Survey Boundary

500m Buffer

Pond Locations (No GCN Presence)

client

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Pond Locations within 500m

date	**12 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d005a**	checked	**EMc**
scale	**1:15,000 @ A3**	QA	**GY**

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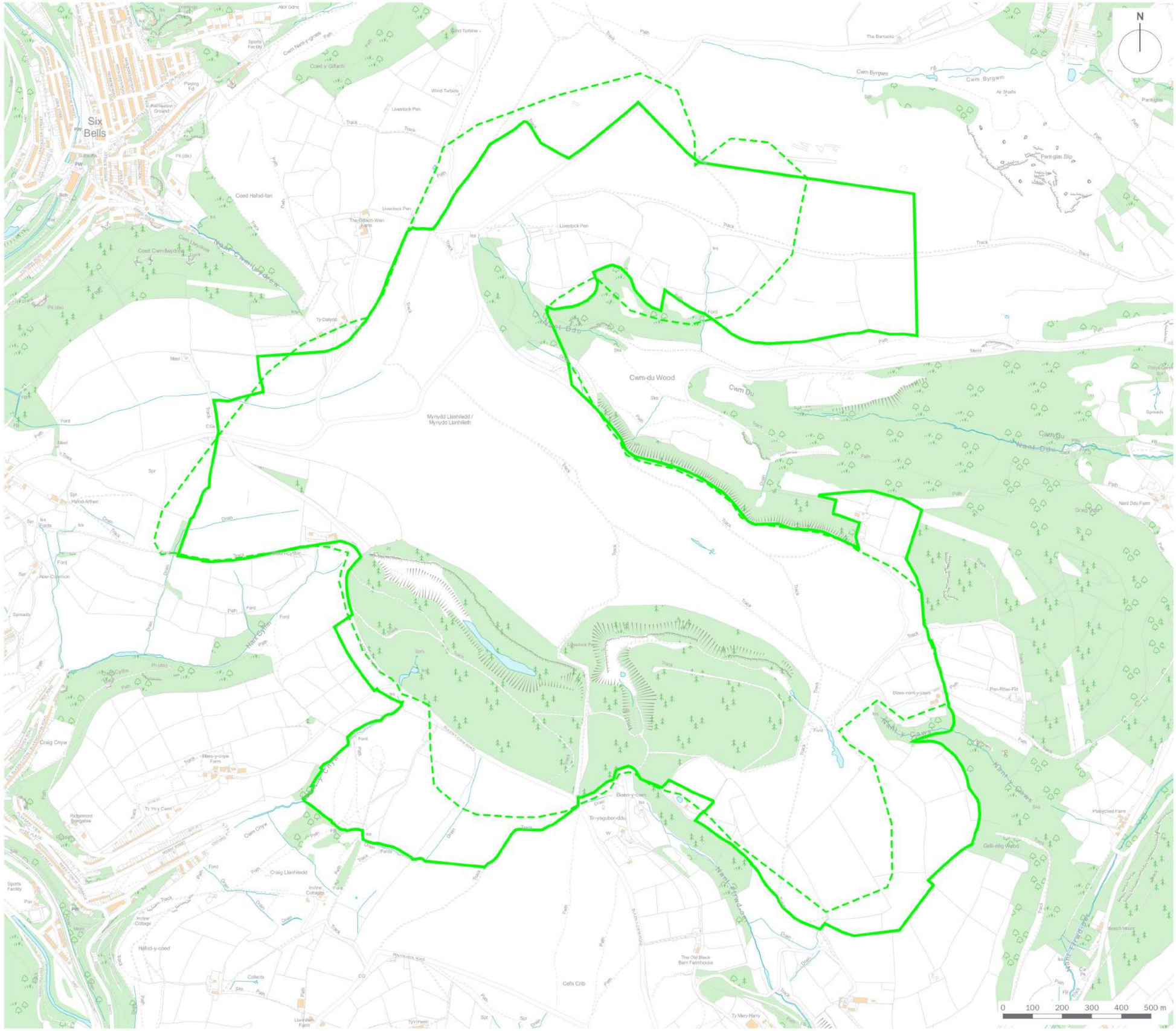
Appendix 6.1: Core Study Area in 2020 and 2021 (edp6367_d042a 13 May 2021 MJC/RF)



Core Study Area - 2021

Core Study Area - 2020

client

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project title

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drawing title

Core Study Area in 2020 and 2021

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d042a**	checked	**RF**
scale	**1:12,500 @ A3**	QA	**GY**

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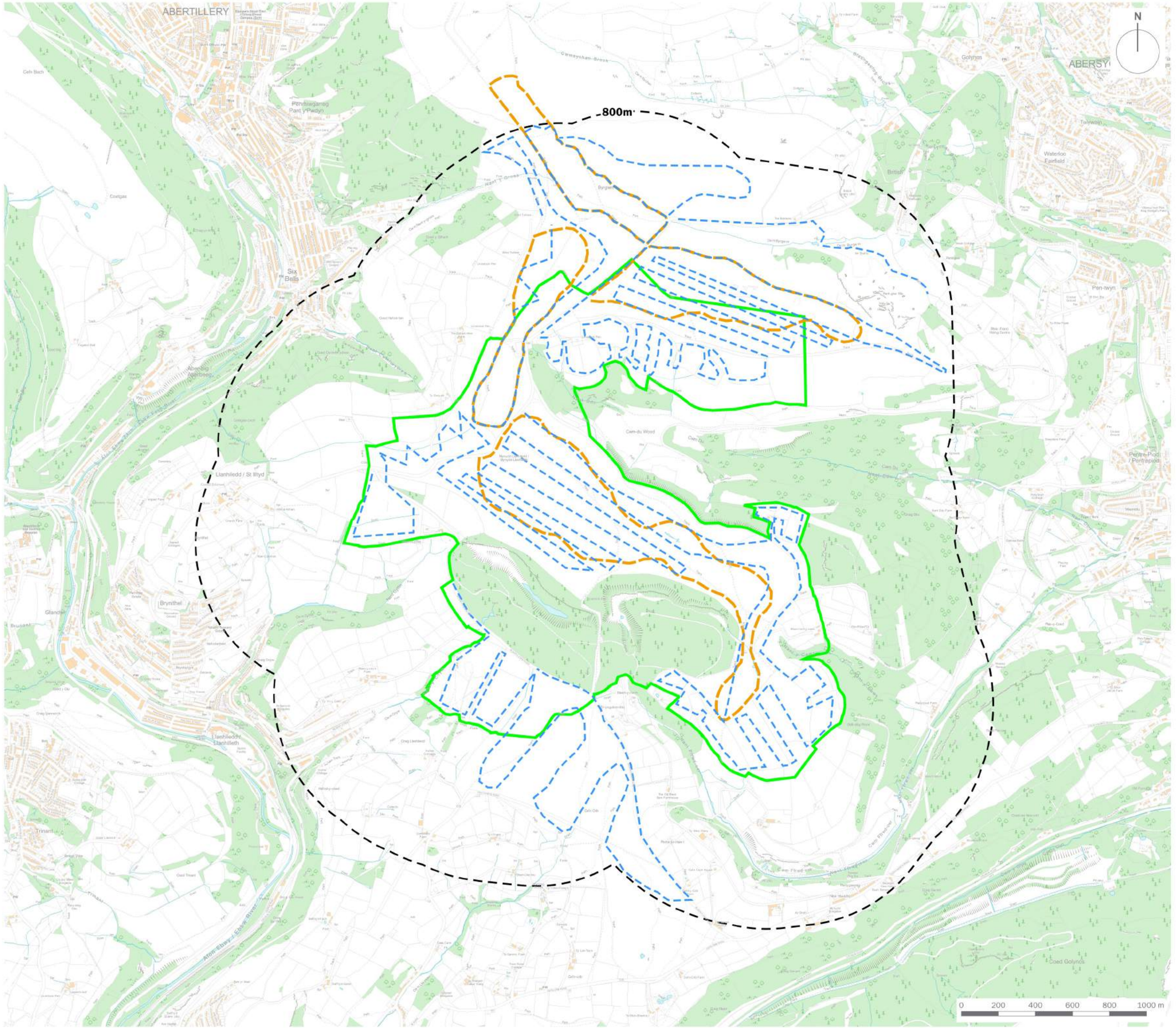
Appendix 6.2: Moorland Breeding Bird Transect Routes (edp6367_d012a 13 May 2021 MJC/RF)



NB: Indicative route shown targeting moorland habitats

client

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project title

Mynydd Llanhilleth Wind Farm

drawing title

Moorland Breeding Bird Transect Routes

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d012a**	checked	**RF**
scale	**1:20,000 @ A3**	QA	**GY**

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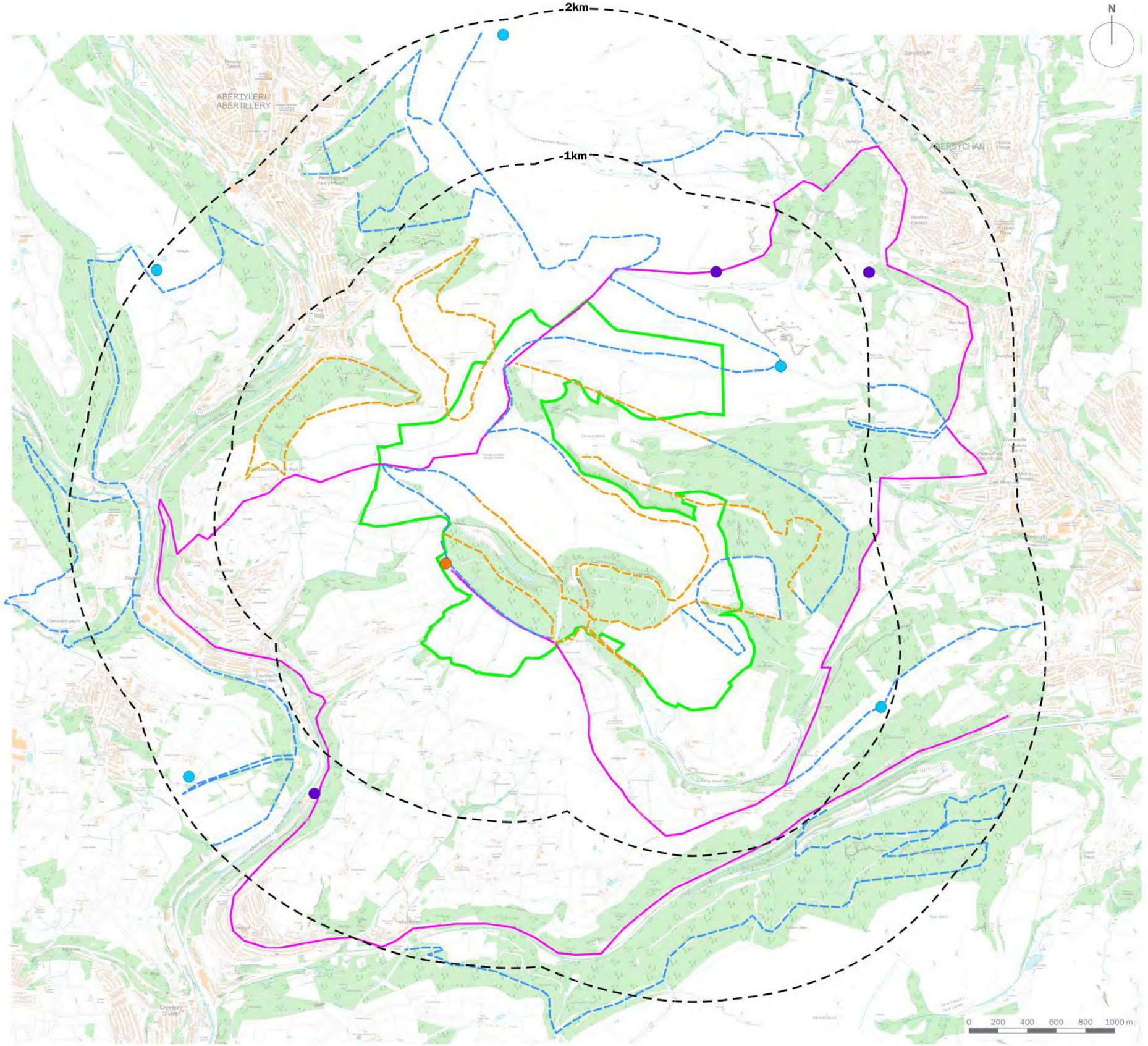
Appendix 6.3: Raptor Survey Route and Vantage Points (edp6367_d011a 13 May 2021 MJC/RF);



Core Study Area

Range Rings (at 1km intervals)

Transect Routes

2021 Walked

2020 and 2021 Walked

2020 and 2021 Driven

Vantage Points

2021

2020

2020 and 2021

NB: Indicative routes shown with the number of visits to each area subject to breeding activity recorded. If a potential nesting territory appeared to be unoccupied on the basis of the first two visits then further visits to that territory were omitted.

client

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project title

Mynydd Llanhilleth Wind Farm

drawing title

Raptor Survey Route and Vantage Points

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d011a**	checked	**RF**
scale	**1:26,000 @ A3**	QA	**GY**

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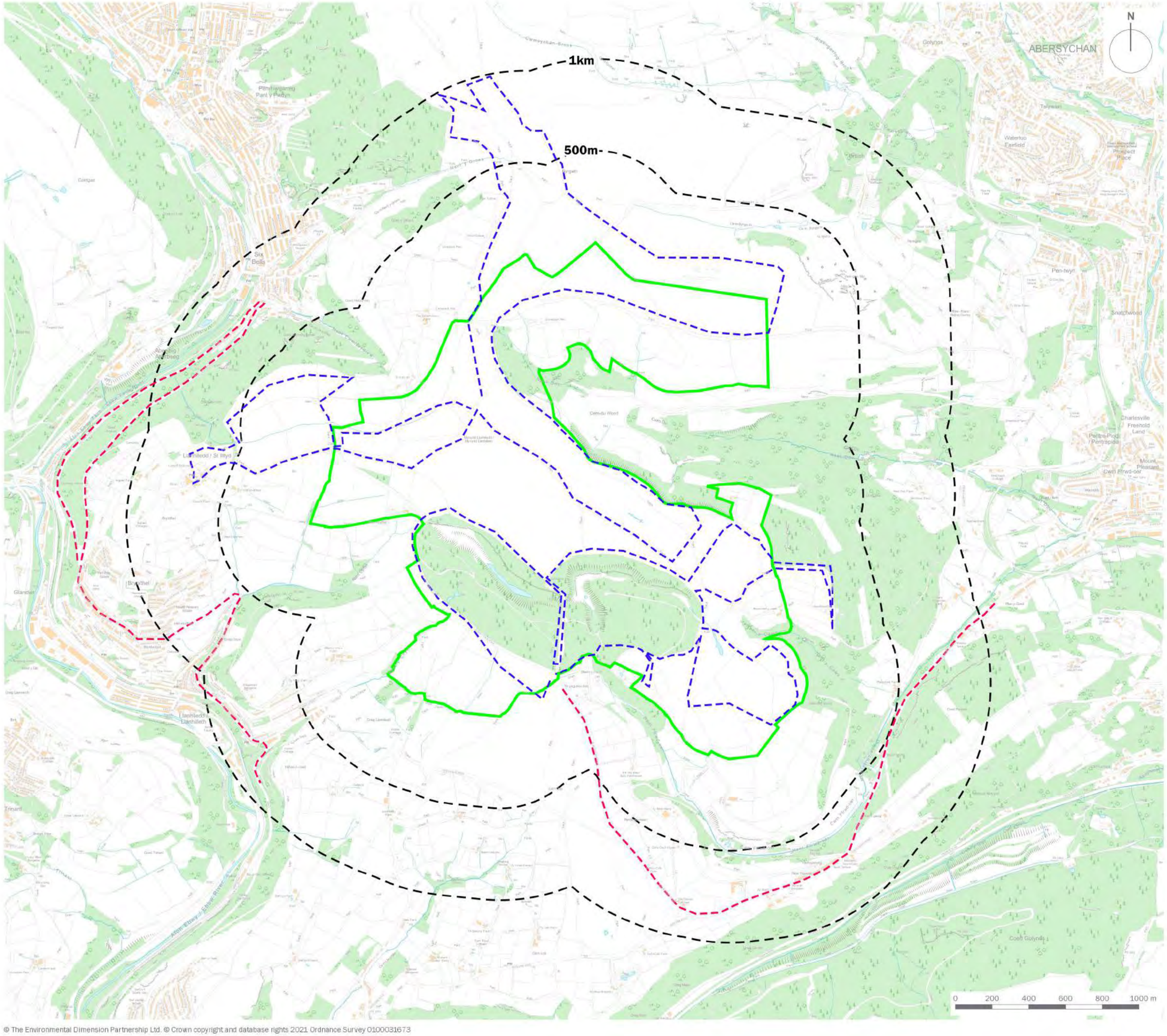
Appendix 6.4: Nightjar and Owl Transect Routes (edp6367_d010a 13 May 2021 MJC/RF)



Core Study Area

Range Rings (at 500m intervals)

Nightjar and Owl Survey Transect Routes

2021 - Driven Route

2020 and 2021 - Walked Route

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Nightjar/Owl Survey Routes

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d010a**	checked	**RF**
scale	**1:20,000 @ A3**	QA	**GY**

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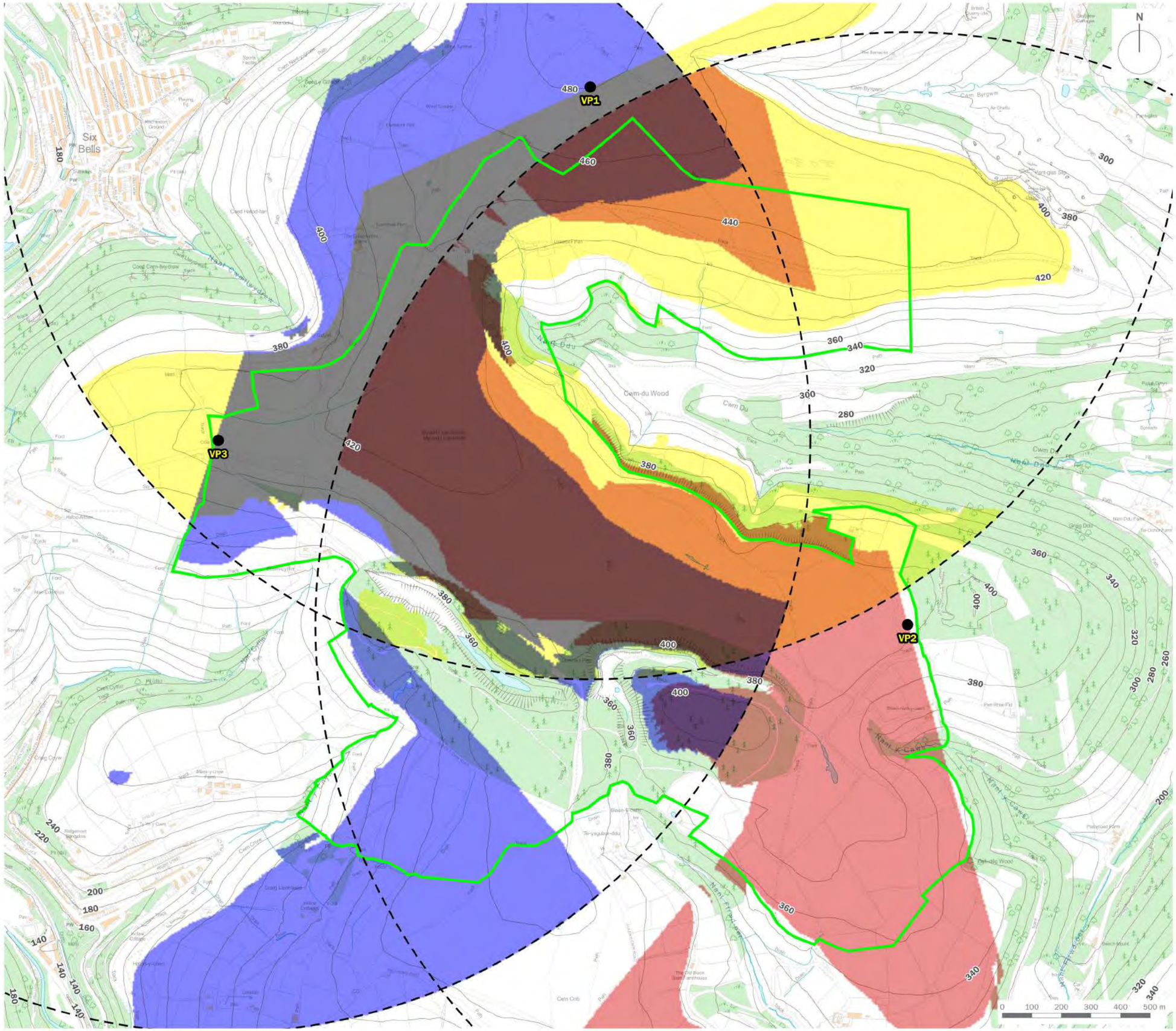
Appendix 6.5: Vantage Point Locations and Zones of Theoretical Visibility (edp6367_d001b 13 May 2021 MJC/RF)



Zone of Theoretical Visibility (ZTV) Parameters:

- Visibility at 25m Above Ground Level
- Observer height: 1.75m
- Woodland height: 18m
- 180° Field of View
- 5m Terrain Model

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Vantage Point Locations and Zones of Theoretical Visibility (ZTV)

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d001b**	checked	**RF**
scale	**1:12,500 @ A3**	QA	**GY**

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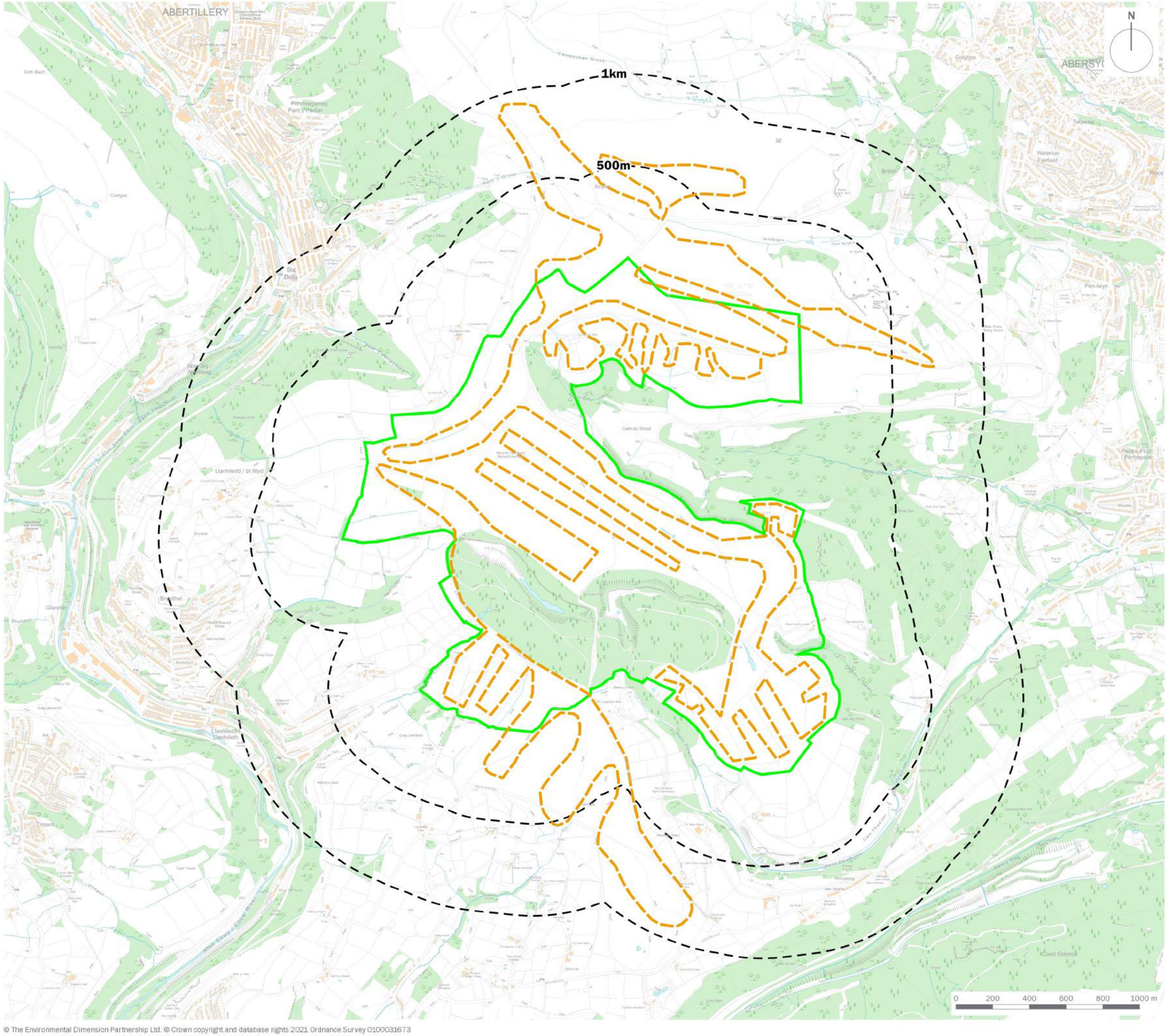
Appendix 6.6: Winter Transect Routes (edp6367_d043a 04 May 2021 MJC/RF)



Core Study Area

Range Rings (at 500m intervals)

Winter Bird Survey Transect Route

NB: Indicative route shown

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drawing title

Winter Bird Survey Transect Route

date	**04 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d043a**	checked	**RF**
scale	**1:20,000 @ A3**	QA	**GY**

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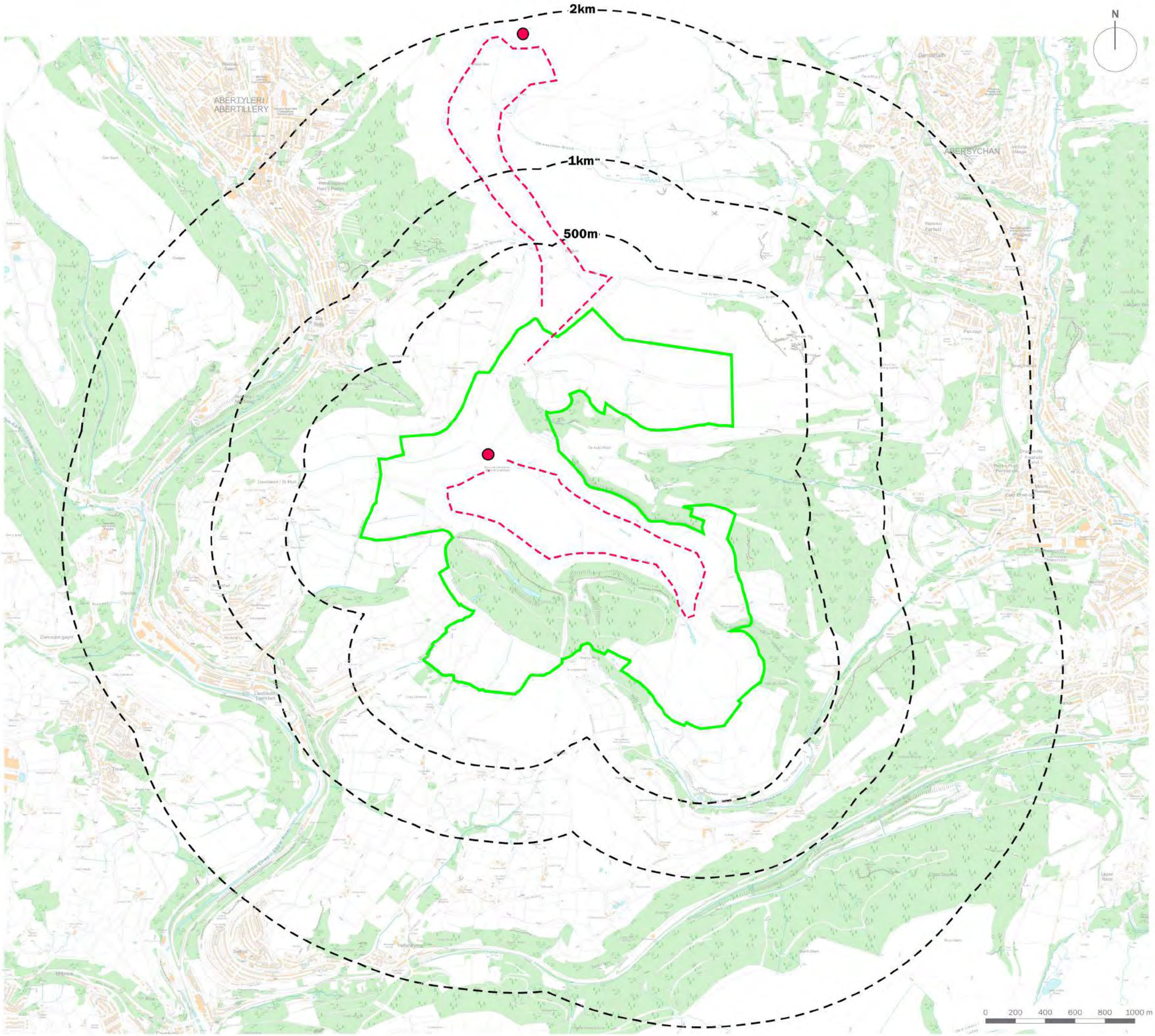
Appendix 6.7: Hen Harrier Vantage Points and Transects (edp6367_d044a 13 May 2021 MJC/RF)



Core Study Area

Range Rings (at 500m, 1km and 2km)

Hen Harrier Survey Route

Hen Harrier Vantage Points

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Hen Harrier Roost Survey

date	**13 MAY 2021**	drawn by	**MJC**
drawing number	**edp6367_d044a**	checked	**RF**
scale	**1:25,000 @ A3**	QA	**GY**

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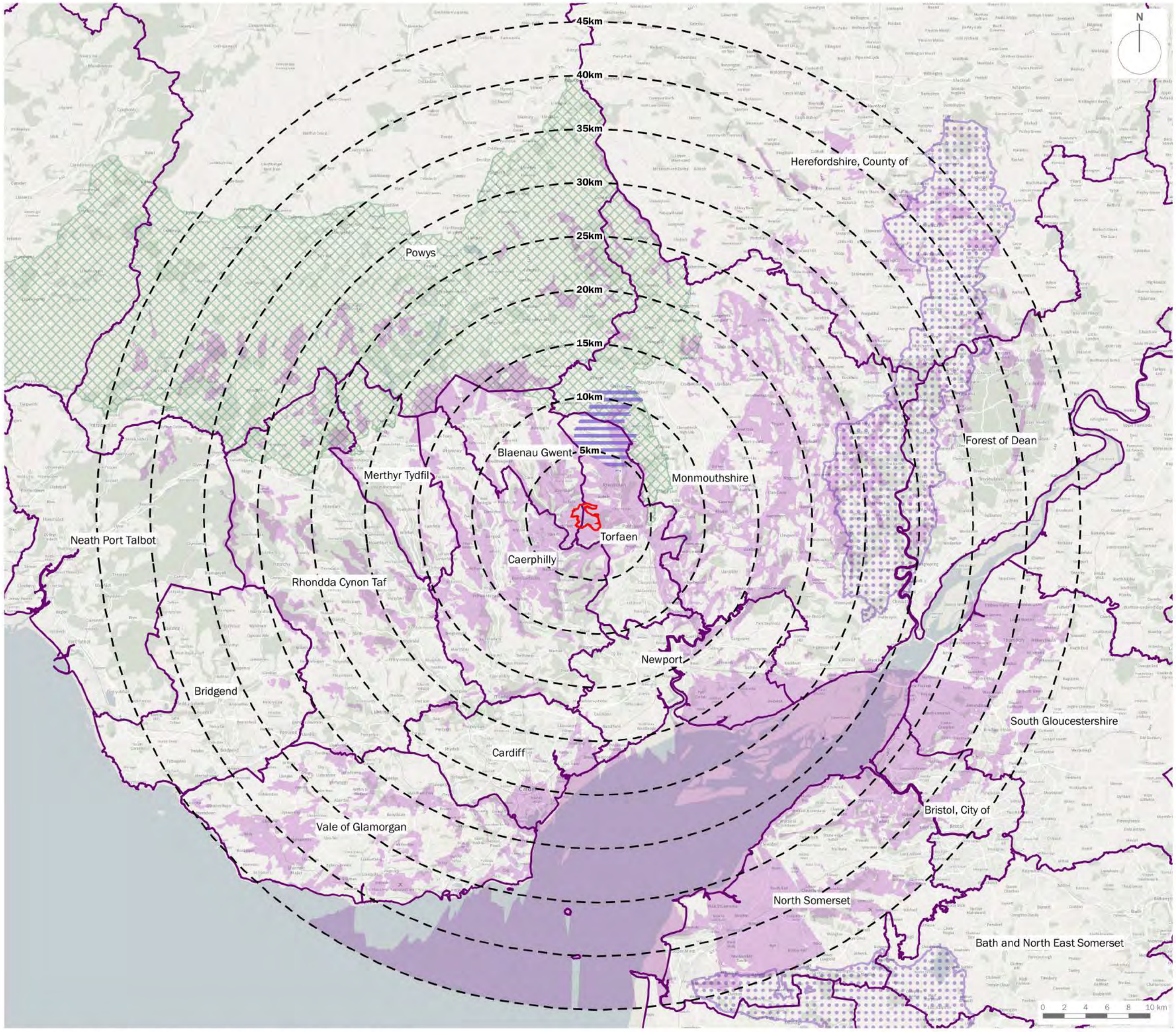
Appendix 7.1: ZTV 45km extent (edp6367_d027a 18 May 2021 JTF/MD)



Scoping Site Boundary

Range Rings (at 5km intervals)

Local Authority Boundaries

Wye Valley AONB

Brecon Beacons National Park

Blaenavon World Heritage Site

Zone of Theoretical Visibility

ZTV 180m Blade Tip Height

Zone of Theoretical Visibility (ZTV) was calculated using a spatial modelling algorithm which considers the following parameters:

- 1.6m Receptor Elevation (Observer Height)
- 180m Proposed Turbine Locations (Blade Tip Height)
- 360 Degree Field of View
- OS Terrain 50m Digital Terrain Model (DTM) (vertical accuracy of +/- 4m)

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project title

Mynydd Llanhilleth Wind Farm

drawing title

Zone of Theoretical Visibility (45km Extent)

date	**18 MAY 2021**	drawn by	**JTF**
drawing number	**edp6367_d027a**	checked	**MD**
scale	**Refer to scale bar @ A3**	QA	**GY**

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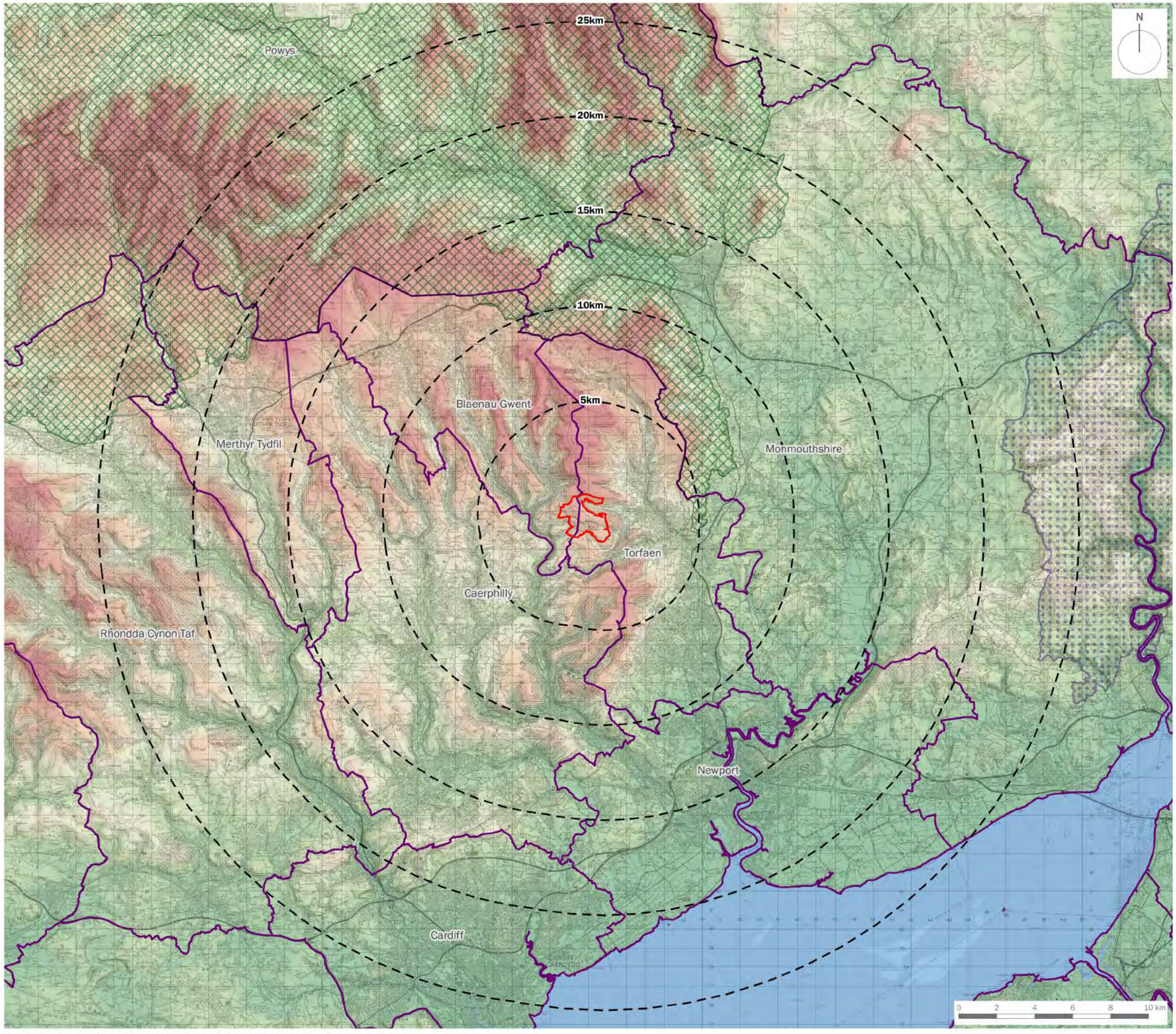
Appendix 7.2: Topography Plan with LPA boundaries (edp6367_d031a 18 May 2021 CLM/MD)



Scoping Site Boundary

Range Rings (at 5km intervals)

Local Authority Boundaries

Brecon Beacons National Park

Wye Valley AONB

Elevation (aOD)

0m
50m
100m
150m
200m
250m
300m
350m
400m
450m
500m

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

Topography Plan

date	**18 MAY 2021**	drawn by	**CLM**
drawing number	**edp6367_d031a**	checked	**MD**
scale	**Refer to scale bar @ A3**	QA	**GY**

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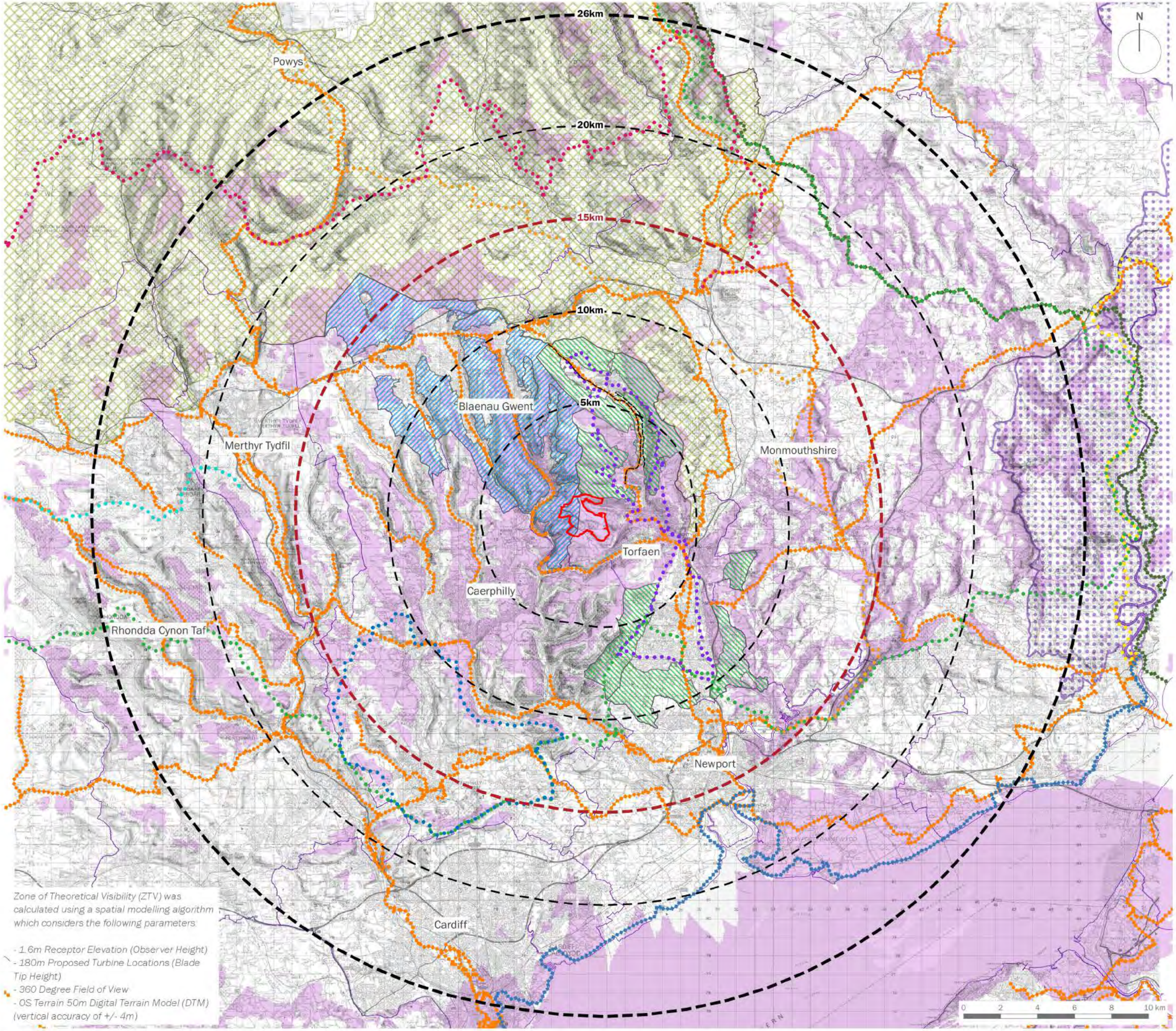
Appendix 7.3: ZTV with SLAs (edp6367_d034a 18 May 2021 CLM/MD)



Scoping Site Boundary

Range Rings (at 5km intervals)

Broad Study Area

Detailed Study Area

Local Authority Boundaries

Brecon Beacons National Park

Wye Valley AONB

Special Landscape Areas (SLA)

Blaenau Gwent SLA

Torfaen SLA

Torfaen Former Rail Routes Safeguarding

Promoted and Themed Routes

Brecon Beacon Way

Cistercian Way

Coedmorgannwg Way

Rhymney Valley Ridge Way

Torfaen Trail

Usk Valley Walk

Wye Valley Walk

National Trail

Coastal Path

National Cycle Route

Zone of Theoretical Visibility

ZTV 180m Blade Tip Height

Zone of Theoretical Visibility (ZTV) was calculated using a spatial modelling algorithm which considers the following parameters:

- 1.6m Receptor Elevation (Observer Height)
- 180m Proposed Turbine Locations (Blade Tip Height)
- 360 Degree Field of View
- OS Terrain 50m Digital Terrain Model (DTM) (vertical accuracy of +/- 4m)

client

Pennant Walters

project title

Mynydd Llanhilleth Wind Farm

drawing title

ZTV with SLAs

date	**18 MAY 2021**	drawn by	**CLM**
drawing number	**edp6367_d034a**	checked	**MD**
scale	**1:200,000 @ A3**	QA	**GY**

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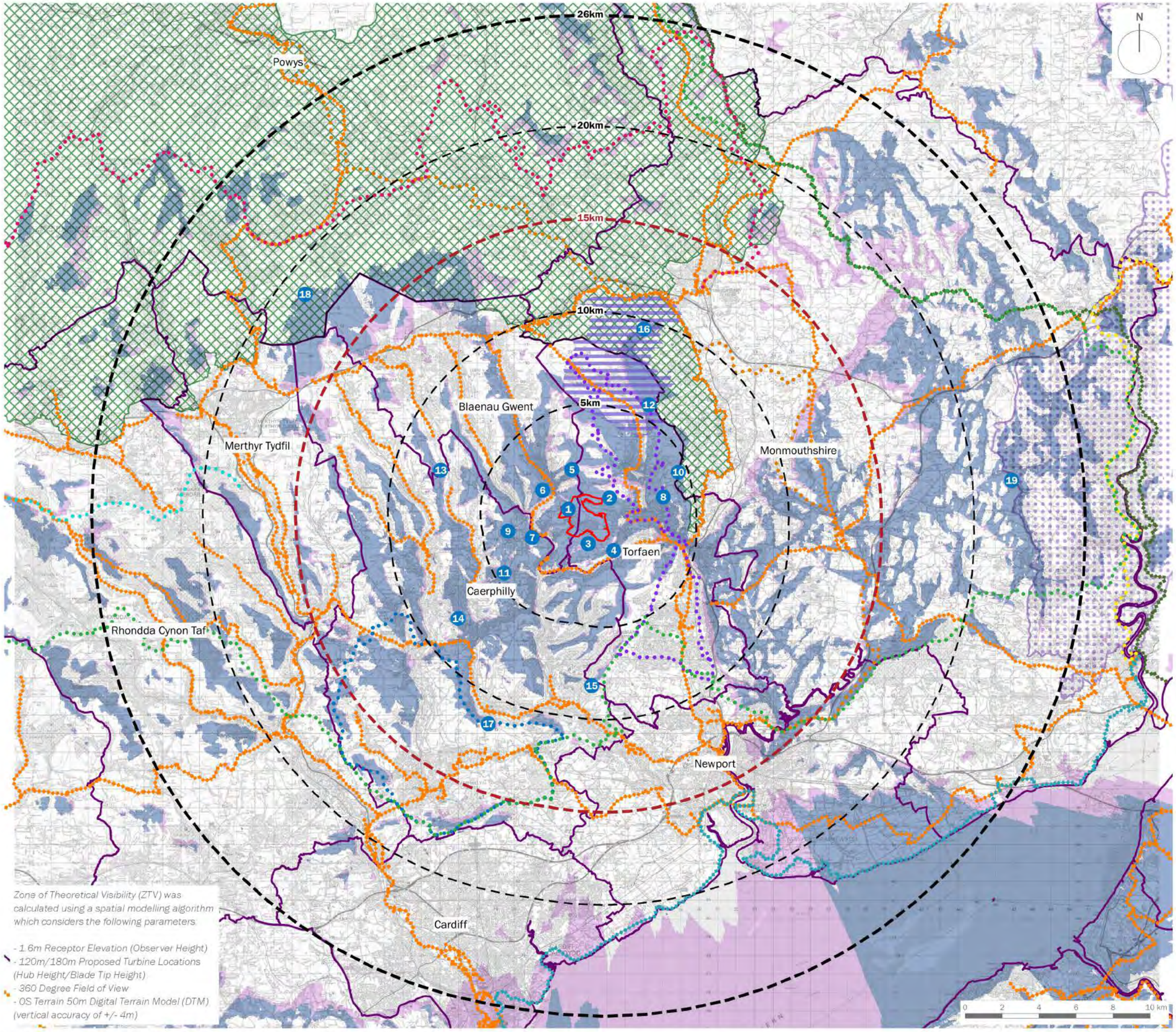
Appendix 7.4: Proposed Viewpoint Locations (edp6367_d035a 18 May 2021 CLM/MD)



Zone of Theoretical Visibility (ZTV) was calculated using a spatial modelling algorithm which considers the following parameters.

- 1.6m Receptor Elevation (Observer Height)
- 120m/180m Proposed Turbine Locations (Hub Height/Blade Tip Height)
- 360 Degree Field of View
- OS Terrain 50m Digital Terrain Model (DTM) (vertical accuracy of +/- 4m)

Scoping Site Boundary
Range Rings (at 5km intervals)
Broad Study Area
Detailed Study Area

PVP Locations

1. Public Footpath in Mynydd Common in Eastern Ridge & Mynydd James SLA
2. Public Footpath to the east in Western Uplands SLA
3. Blaen-y-cwm Road looking north
4. Public Footpath in Pantygasseg
5. Public footpath east of Abertillery
6. Public footpath west of Six Bells in Mynydd Carn-y-Cefn SLA
7. Llanerch Lane in Pen-tywn
8. Torfaen Trail east of Snatchwood
9. Residential view from Pontllanfraith
10. Brecon Beacons NP south-west view
11. Residential view from Croespenmaen
12. Blaenavon World Heritage Site in Eastern Uplands SLA
13. Rocking Stone Scenic Viewpoint west of Cwm in Mynydd Bedellty, Rhymney & Sirhowy Sides SLA
14. Residential view from Pontllanfraith
15. Twmbarlwn summit (aka The Pimple)
16. The Blorenge, Brecon Beacons NP
17. Rhymney Valley Ridge Walk
18. Cefn yr Ystrad, Brecon Beacons NP
19. Wye Valley AONB

Local Authority Boundaries

Zone of Theoretical Visibility
- ZTV 180m Blade Tip Height
- ZTV 120m Hub Height

Designations
- Blaenavon World Heritage Site
- Brecon Beacons National Park
- Wye Valley AONB

Promoted and Themed Routes
- National Trails
- Coastal Path
- National Cycle Routes
- Brecon Beacons Way
- Cistercian Way
- Coed Morgannwg Trail
- Rhymney Valley Ridge Way
- Torfaen Trail
- Usk Valley Walk
- Wye Valley Walk

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Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Photoviewpoint Locations

date	**18 MAY 2021**	drawn by	**CLM**
drawing number	**edp6367_d035a**	checked	**MD**
scale	**1:200,000 @ A3**	QA	**GY**

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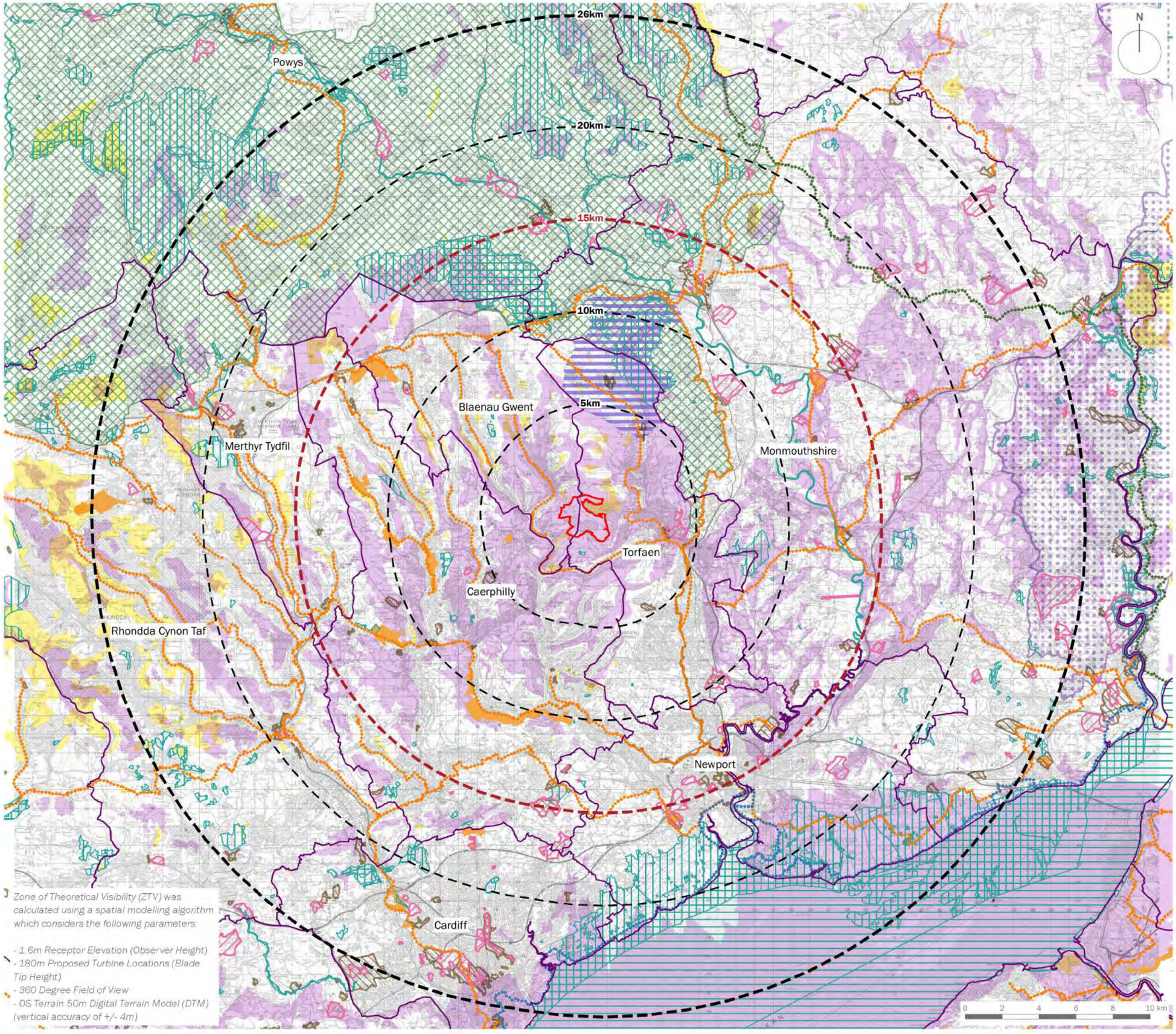
Appendix 7.5: Environmental Planning Considerations (edp6367_d036a 18 May 2021 CLM/MD)



Zone of Theoretical Visibility (ZTV) was calculated using a spatial modelling algorithm which considers the following parameters:

- 1.6m Receptor Elevation (Observer Height)
- 180m Proposed Turbine Locations (Blade Tip Height)
- 360 Degree Field of View
- OS Terrain 50m Digital Terrain Model (DTM) (vertical accuracy of +/- 4m)

Scoping Site Boundary
Range Rings (at 5km intervals)
Broad Study Area
Detailed Study Area
Local Authority Boundaries

Zone of Theoretical Visibility
ZTV 180m Blade Tip Height

Landscape
Brecon Beacons National Park
Wye Valley AONB
Country Parks
Open Access Land
National Cycle Routes
National Trails
Coastal Path

Ecology
SSSI
SAC

Heritage
Blaenavon World Heritage Site
Conservation Areas (CADW)
Registered Parks and Gardens

Notes
Designations omitted from this plan include: listed buildings; scheduled monuments; conservation areas; ancient woodland; and public rights of way. These designations are shown at edp6367_d037 at a range of 5km.

client
Pennant Walters

project title
Mynydd Llanhilleth Wind Farm

drawing title
Environmental Planning Considerations

date	**18 MAY 2021**	drawn by	**CLM**
drawing number	**edp6367_d036a**	checked	**MD**
scale	**1:200,000 @ A3**	QA	**GY**

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