

**GREEN
GEN
CYMRU**

SWECO 

Green GEN Rhiwlas Connection

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

March 2024

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1 Introduction

1.1 Overview

- 1.1.1 Sweco has been commissioned to produce an Environmental Impact Assessment (EIA) Scoping Report on behalf of Green Generation Energy Networks Cymru Limited (Green GEN Cymru) ('the applicant') for a proposed new 132 kilovolt (kV) grid connection in mid-Wales which will provide a connection between the proposed Banc Du and Rhiwlas Energy Parks to a collector substation adjacent to the proposed Llyn Lort Energy Park approximately 25 km to the northeast.
- 1.1.2 The grid connection has been the subject of a routeing appraisal process in line with Green GEN Cymru's Approach to Routeing Grid Infrastructure in Wales¹. The routeing appraisal process appraises up to three routes and seeks to ensure that the final selected route following the appraisal process minimises key environmental impacts and technical constraints. The routeing appraisal is documented within the Routeing Consultation Document (RCD), included as Appendix A. The RCD formed part of the consultation materials, for the consultation undertaken in November 2023 and January 2024 and evidenced the routeing appraisal process.
- 1.1.3 The output of the routeing appraisal process is a single preferred corridor, within which the route option for the grid connection will be developed. This is referred to as a 'Scoping Report Corridor' and this term is used in this EIA Scoping Report to represent the boundary of the land that may be subject to the proposed development.
- 1.1.4 The Banc Du and Rhiwlas Energy Parks will be consented separately from the proposed development.

1.2 Purpose of the EIA

- 1.2.1 This EIA Scoping Report accompanies Green GEN Cymru's request for a Scoping Direction which is being sought from Planning and Environment Decisions Wales (PEDW) in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017² (hereafter referred to as the 'EIA Regulations'). The Scoping Direction received from PEDW will set out any further matters to be assessed in the subsequent Environmental Statement (ES) for the proposed development.
- 1.2.2 The purpose of the EIA process is to ensure that the proposed development has due regard for the environment, minimising adverse environmental effects and identifying opportunities for environmental enhancement. The report prepared at the end of the EIA, the ES, will provide sufficient information to allow the Welsh Ministers to make an informed decision on the application for the proposed development, taking account of relevant environmental information.
- 1.2.3 This report explains the proposed approach to the EIA and provides a formal opportunity for PEDW to gather opinions and comments from stakeholders. It reviews the possible environmental impacts that may be associated with the proposed development, including those that could affect sensitive receptors. It subsequently identifies potential impacts which may result in significant environmental effects and would, therefore, need to be assessed within the EIA. This report also provides details of the methodologies that are proposed to assess those effects. It also seeks to identify categories of receptors where likely significant effects are not expected to arise, and accordingly can be scoped out of the EIA

1.3 Report Structure

- 1.3.1 The structure of the EIA Scoping Report is outlined in Table 1.1.

TABLE 1.1: STRUCTURE OF THE EIA SCOPING REPORT

Chapter	Title	Content
1	Introduction	Introduction to the objectives and structure of the EIA Scoping Report.
2	Scoping Report	A brief description of the Scoping Report Corridor (size,

¹ Green Gen Cymru. (n.d.). Approach to routeing grid infrastructure in Wales. Available at: <https://rhiwlasgen.wales/downloads/Approach%20to%20routeing%20Grid%20infrastructure%20in%20Wales.pdf>

² Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. Available at: <https://www.legislation.gov.uk/wsi/2017/567/contents/made>

	Corridor and Proposed Development	location, surrounding area) and the key elements of the proposed development.
3	The EIA Process and Scoping	Overview of the EIA process and the proposed methodology, including for the assessment of significance and cumulative effects. Overview of the methodology for the scoping of potential environmental effects and a summary of disciplines proposed to be included within the EIA scope.
4	Transport and Access	Chapters 4 to 18 provide technical information and preliminary analysis on each of the environmental disciplines. For each discipline, sensitive receptors are identified, and the likelihood of potentially significant effects considered. Where it is not considered likely that there would be a significant effect this discipline is 'scoped out' of the EIA. Where there is the potential for a significant effect this discipline is 'scoped in' to the EIA and the chapter further outlines the proposed methodologies for the assessment of potential effects associated with the discipline.
5	Air Quality	
6	Noise and Vibration	
7	Ecology	
8	Landscape and Visual Impact	
9	Cultural Heritage and Archaeology	
10	Land Quality	
11	Soils and Agriculture	
12	Material Assets and Waste	
13	Flood Risk, Hydrogeology and Hydrology	
14	Socioeconomics	
15	Health and Wellbeing	
16	Climate Change	
17	Electromagnetic Fields	
18	Major Accidents and Disasters	
19	Cumulative Effects Assessment	Description of the approach to cumulative assessment
20	Conclusions	Summary of key conclusions from the EIA Scoping Report, including proposed structure of the ES.

2 Scoping Report Corridor and Proposed Development

2.1 Introduction

- 2.1.1 This chapter provides an overview of the Scoping Report Corridor and surrounding area and outlines the proposed development.

2.2 Scoping Report Corridor

- 2.2.1 The Scoping Report Corridor was identified as the preferred corridor for the proposed development following the identification and appraisal of route corridors in November 2023, documented within the RCD and presented in Figure 2.1. Route corridor options were appraised in terms of environmental, technical, and economic considerations and the Scoping Report Corridor was presented to the public during consultation events from November 2023 to January 2024. and the Scoping Report Corridor currently represents a 'maximum parameter' of the proposed development for EIA Scoping. During the detailed routing process the width of the corridor will be reduced.
- 2.2.2 The Scoping Report Corridor is located within the county of Powys and commences approximately 2km northwest of Tan-y-Foel Quarry close to existing buildings known as Bryngwyn in central Wales; and extends south from this point then west, to the village of Llangurig. At its widest point, the Scoping Report Corridor is approximately 1690 m and at its narrowest point approximately 290 m. The Scoping Report Corridor crosses communities including Clatter, Trefeglwys and Llanidloes.
- 2.2.3 The Scoping Report Corridor is not located within an ecological designated site, part of the corridor is located within Clywedog Valley Registered Landscape of Outstanding and of Special Interest in Wales. There are several areas of Ancient Woodland and woodland recorded in the national inventory of woodland and trees within the Scoping Report Corridor. Ancient Woodland present includes semi natural, restored and plantation Ancient Woodland. The Scoping Report Corridor encompasses two Scheduled Monuments (Y Capel Stone Circle and Domen Glw Cairn), and two listed buildings, Ystradfaelog Grade II* and Pwllpridd Grade II listed buildings.
- 2.2.4 The River Severn and several tributaries cross the Scoping Report Corridor and some areas within the corridor are within flood zones 2 and 3. There are areas of surface water throughout the corridor at low, medium and high flood risk and small waterbodies.

2.3 Surrounding Area

- 2.3.1 The area surrounding the Scoping Report Corridor is predominantly rural with interspersed towns and villages.
- 2.3.2 As presented on Figure 2.2, there are several ecological designated sites located within 2 km of the Scoping Report Corridor. These include:
- Llyn Mawr Site of Special Scientific Interest (SSSI) which is located approximately 1 km east of the Scoping Report Corridor;
 - Gwaun Cilgwyn SSSI which is located approximately 800 m south of the corridor;
 - Coed Mawr SSSI which is adjacent to the north of the corridor;
 - Gwaun Bwlch Hafod-y-gog SSSI which is located approximately 350 m northwest of the corridor;
 - Coedydd y Beili, Malgwyn a Cribin SSSI which is located approximately 1.2 km north of the corridor; and
 - Caersws Basin Registered Landscape of Outstanding and of Special Interest in Wales which is located approximately 1.3 km east of the corridor.
- 2.3.3 There are areas of Ancient Woodland and forests surrounding the Scoping Report Corridor. Ancient Woodland present includes semi natural, restored and plantation Ancient Woodland. There are several listed buildings within 300 m of the Scoping Report Corridor, although there are no Scheduled monuments within 300 m of the Scoping Report Corridor.
- 2.3.4 The Banc Du and Rhiwlas Energy Parks are located to the southern extent of the Scoping Report Corridor, approximately 1.9 km from Llangurig with Banc Du to the north and Rhiwlas to the south-east.

The proposed Lynn Lort Energy Park is located approximately 20 km northeast of the Banc Du and Rhiwlas Energy Parks.

2.4 Proposed Development

- 2.4.1 The proposed development will consist of a new grid connection to connect the Banc Du and Rhiwlas Energy Parks to a proposed new 132kV collector substation (which is part of a different Green GEN Cymru scheme), which will collect the energy generated for all of Bute Energy's mid-Wales north sites. The connection of the two energy parks will commence at the Banc Du Energy Park whereby an underground cable of approximately 3.5 km will link to the proposed Rhiwlas Energy Park. A single 132kV overhead line (OHL) commencing at Rhiwlas Energy Park will then connect the energy parks to the final point of connection at the collector substation adjacent to the proposed Llyn Lort Energy Park to the north.
- 2.4.2 A search area location for the proposed collector substation has been identified near Rhyd-y-Biswal, approximately 4.5 km southeast of Cefn Coch. The collector substation, energy parks, potential underground connection and the potential OHL routes are located within the Powys County Council Local Authority area. The proposed development within this EIA Scoping Report refers to only the underground connection between the Banc Du and Rhiwlas Energy Parks and the single 132kV OHL connecting the energy parks to the collector substation adjacent to the proposed Llyn Lort Energy Park.

Overhead Line Infrastructure

- 2.4.3 The new 132kV OHL will comprise approximately 35 km of 132kV single circuit double wood poles between the proposed Rhiwlas Energy Park and the collector substation adjacent to the proposed Llyn Lort Energy Park.
- Wood poles*
- 2.4.4 Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structure integrity. New wood poles are dark brown in colour and weather over the years to a light grey.
- 2.4.5 Double (also known as 'H') poles are proposed to be used for the new connection. Three types of wood pole will be required:
- **Intermediate:** where the pole forms part of a straight-line section
 - **Angle:** where the OHL requires a change of direction. All angle structures will require to be back stayed.
 - **Terminal:** where the OHL terminates into the substation or onto the underground cable via a cable sealing end.
- 2.4.6 Maximum allowable angle deviations of up to 75° are permitted on 'H' pole line, subject to specific limitations.
- 2.4.7 'Trident' poles may be used in some locations, however H poles have been considered as part of the proposed development for the purposes of EIA Scoping as they are larger structures and therefore represent a 'worst case' in terms of potential environmental effects.

Pole heights and span lengths

- 2.4.8 The standard wood pole height is 15 m (including steelwork and insulators), and individual pole heights are determined to meet statutory clearance requirements. Pole height may be required to be increased where circumstances dictate, e.g., road and railway crossings, over elevated land, structures, or features. Pole sizes may also be slightly reduced where there are short spans or localised topography. Consequently, the heights of the poles (above ground to the top of the insulators mounted on the poles), typically range from 10 to 22 m with an average height of 15 m. For the purposes of the EIA, 22 m above ordnance datum (AoD) is determined as the maximum parameter.
- 2.4.9 The average span length between wood poles is approximately 85 m, although the length of individual spans can vary to suit localised conditions, depending on route alignment needs, landform / topography, existing infrastructure and environmental constraints, ownership boundaries conditions and the like.

Typically, a maximum possible span would be 120 -140 m. For the purposes of the EIA 85 m is determined as the maximum parameter ('maximum' as this would represent the greater number of poles).

Overhead line components

- 2.4.10 The OHL will carry one 3-phase circuit; therefore, the poles will support three conductors. Each conductor is made of aluminium alloy, with a nominal diameter of 22 – 25 mm².
- 2.4.11 Insulators attached to the pole cross arms support the conductors and prevent the electric current from crossing to the pole body. The insulators are likely to be made from a polymeric compound (grey plastic). The steelwork and insulators are between approximately 10 – 22 m in height. For the purposes of the EIA 22 m AoD is determined as the maximum parameter.

Ancillary development

- 2.4.12 In addition to the proposed wooden poles supporting the OHL conductors, ancillary development will be required to facilitate the construction of the OHL. Ancillary development will include construction working areas around individual poles, temporary access tracks, watercourse crossings, winching/pulling areas and construction compounds/laydown areas. This ancillary development will be temporary and will be removed and the ground re-instated following completion of construction of the OHL.

Underground cabling infrastructure

- 2.4.13 Underground cabling infrastructure (33kV) will be required between the Banc Du and Rhiwlas Energy Parks. Underground cabling (132kV) may also be required for other sections of the OHL route, in response to identifying environmental and/or technical constraints. This will be determined as the detailed routing and environmental assessment progresses.
- 2.4.14 The section of underground cabling between the Banc Du and Rhiwlas Energy Parks would be approximately 3.5km in length. The conductors would be encased in insulated material and buried in a backfilled trench, with an adjacent working area, resulting in a total excavation swathe of approximately 20m in width. Where the underground cables connect to the OHL, there would likely be the need for the construction of a permanent fenced area for the terminal supports and cable sealing ends.
- 2.4.15 Methods have been identified within the EIA Scoping Report discipline chapters to assess potential environmental impacts related to undergrounding and therefore if undergrounding is utilised for additional sections of the route, these methods will be employed to assess impacts. It is noted that potential impacts on some disciplines during construction and/ or operation may increase as a result of undergrounding (such as geology and soils), and potential impacts on some disciplines may reduce (such as landscape and visual).
- 2.4.16 As set out in paragraph 2.4.12 there will be similar elements of ancillary development required for underground cable installation (e.g. temporary access tracks, watercourse crossings and construction compounds/laydown areas).

2.5 Construction works

Overhead Line

Construction activities

- 2.5.1 The construction of the new 132kV OHL, will follow a well-established sequence of activities as outlined below:
 - Preparation of accesses and felling of woodland (where required but this will be minimised wherever practicable);
 - Delivery of pole, excavation of foundations and erection of poles;
 - Pole conductor 'stringing' and commissioning of the OHL; and
 - Removal of temporary infrastructure and reinstatement. The construction of OHLs can sometimes require temporary infrastructure such as temporary accesses to pole locations. All have minimal /

no maintenance requirements and will be subject to recognised procedures for dismantling/ decommissioning.

- 2.5.2 Methods of construction would be utilised to reduce environmental impacts as far as practicable and measures to reduce impacts will be included within a Construction Environmental Management Plan (CEMP) for the works.

Access

- 2.5.2 Prior to construction of the OHL, temporary accesses will be constructed, as needed, and laydown/ storage areas set up, usually mid-way along the route. The use of existing tracks and watercourse crossings will be used where possible, with the upgrading of these if needed.
- 2.5.3 The use of low ground pressure and plant when taking temporary access is preferred. If access is required to be taken through sensitive areas, identified during the EIA process, other less intrusive methods can be applied such as temporary steel matting, or timber roadways.
- 2.5.4 Any trees which may have an impact on safety clearances will be removed or lopped. Safety clearances, in the context of overhead lines and electrical installations, refer to the minimum distances that must be maintained between energized conductors, with other objects or people. Safety clearances help prevent accidental contact with live electrical components, which could result in electric shock, electrocution, or fires.
- 2.5.5 Following commissioning of the OHL, all equipment and temporary access of construction areas will be removed, with the land being reinstated to its prior condition in consultation with the relevant landowner(s).

Temporary working

- 2.5.6 Temporary working areas will be required for the duration of construction works. There is a requirement for temporary vehicular access to every pole location as well.
- 2.5.7 'H' Pole locations have a working area of approximately 15m x 15m for intermediate poles and 30m x 30m for angle/terminal poles. In certain circumstances, the shape/ size of the working area is controlled by the environmental/ land-use constraints that are located nearby.
- 2.5.8 The temporary working areas will be returned and restored to former conditions following the completion of the construction works.

Operation and maintenance

- 2.5.9 Most OHL components require minimal maintenance. The exposed elements which suffer from corrosion, wear, deterioration and fatigue, will require inspection and periodic maintenance over the lifespan of the OHL. OHL cables generally require refurbishment after approximately 40 years.
- 2.5.10 Any felled easement areas will also be managed to maintain the required clearances whilst the connection remains active. These measures will ensure that the necessary safety clearances are maintained to guarantee the safety and functionality of the active utility connections. Walkover surveys or flyovers will identify where there is requirement to clear wayleaves of new growth.

Decommissioning

- 2.5.11 When the operational life of the proposed development ends, it is possible the OHL may be re-equipped with new conductors, insulators and refurbished. However, the OHL may also be decommissioned fully. At this stage, it is anticipated that the operational lifespan of the Banc Du and Rhiwlas Energy Parks will be 40 years. There may be potential to extend the operational life of the energy parks or replace the turbines and electricity infrastructure, which would be subject to new planning consent(s) in the future. The need for the proposed development is therefore linked to the operational lifespans of the energy parks.

Underground Cabling Construction

- 2.5.12 Underground cable construction will be required between the Banc Du and Rhiwlas Energy Parks and may be required at other sections of the route, to be determined as the specific route option is developed.

Methods of construction would be utilised to reduce environmental impacts as far as practicable and measures to reduce impacts will be included within a CEMP for the works.

- 2.5.13 It is proposed that the underground cable that would utilise existing roads and access tracks between the two energy parks as shown within the corridor on Figure 1.1. It is understood that these access tracks are associated with the construction and operation of the Bryn Blaen wind farm.

Construction Timescales

- 2.5.13 Construction activities for the OHL and underground cabling are scheduled to commence in April 2027, to allow an intended operational date of February 2028.
- 2.5.14 Construction would be undertaken in phases, with each phase running consecutively. Phases would include:
- Installation of foundation blocks and assembly of poles;
 - Erection of poles;
 - Stringing of conductors; and
 - Reinstatement of poles working areas.

2.6 Form of application

- 2.6.1 The proposed development will meet the criteria of a Development of National Significance (DNS) as set out in the Planning (Wales) Act 2015. DNS are infrastructure development projects of national importance.
- 2.6.2 As outlined in Chapter 1, the application will be determined by the Welsh Ministers, taking into account recommendations from PEDW. Powys County Council will be a statutory consultee for the application.
- 2.6.3 An overview of the relevant planning policy, from a national to local level, which will be considered as part of the EIA process, is provided below.

2.7 Planning Policy Context

National planning policy

*Welsh Renewable Energy and Climate Change Policy Future Wales: The National Plan 2040 (February 2021)*³

- 2.7.1 Future Wales is the Welsh Government's National Development Framework and is the highest tier of the Development Plan in Wales. Applications for DNS must be determined in accordance with Future Wales.
- 2.7.2 Future Wales has primacy in the planning policy hierarchy, ensuring that planning decisions are consistent and support the delivery of Welsh Government strategic aims and policies (including those in Planning Policy Wales, the Wales Infrastructure Investment Plan and Regional Economic Frameworks). Future Wales has particular regard to the following Welsh Government policy and legislation:
- Planning Policy Wales (Edition 12 February 2024);
 - Well-being of Future Generations (Wales) Act 2015;
 - Environment (Wales) Act 2016;
 - Prosperity for All: A Low Carbon Wales (March 2019); and
 - Policy Statement: Local ownership of energy generation in Wales – benefitting Wales today and for future generations (February 2020).
- 2.7.3 Future Wales provides the spatial direction for development in Wales and the policy framework for Strategic and Local Development Plans. These plans are required to conform to Future Wales and planning decisions at every level must be taken in accordance with the Development Plan.

³ Future Wales: The National Plan. Available at: gov.wales/sites/default/files/publications/2021-02/future-wales-the-national-plan-2040.pdf

Planning Policy Wales (edition 12) (February 2024)⁴

- 2.7.4 In February 2024 the Welsh Government published Planning Policy Wales Edition 12 (PPW), which provides the key principles for the planning system in Wales, in terms of what development plans and decisions must be achieved and how development should deliver the best possible outcomes. PPW is a material consideration in the planning process.
- 2.7.5 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, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.
- 2.7.6 Section 5.7, paragraphs 5.7.8 -5.7.12 of PPW detail the policy in relation to the electricity grid network and that a positive approach to grid infrastructure should be taken to support low carbon emissions. The proposals of Green GEN Cymru and Bute Energy would make a significant contribution to these ambitions by both unlocking and delivering the renewable energy potential in areas that are not currently serviced by sufficient grid infrastructure.

Technical advice notes

- 2.7.7 Technical advice notes (TANs)⁵ are used to supplement the PPW. The ones that are relevant to the proposed development are:
- TAN 5: Nature Conservation and Planning (published 30th September 2009);
 - TAN 6: Planning for Sustainable Rural Communities (published 30th July 2010);
 - TAN 10: Tree Preservation Orders (published 31st October 1997);
 - TAN 11: Noise (published 31st October 1997);
 - TAN 13: Tourism (published 31st October 1997);
 - TAN 15: Development and Flood Risk (published 30th July 2004, but last updated 24th November 2021);
 - TAN 16: Sport, Recreation and Open Space (published 31st January 2009);
 - TAN 18: Transport (published 31st March 2007);
 - TAN 21: Waste (published 23rd February 2015); and
 - TAN 24: Historic Environment (published 30th May 2017).

Local planning policy

Powys County Council Adopted Local Development Plan (2011-2026) (April 2018)⁶

- 2.7.8 This document focuses on the Council's visions, objectives, policies and proposals for the sustainable development/ use of land in Powys during this time period. Policy RE1 within the development plan focuses on renewable energy. This policy supports the delivery of national policy and encourages renewable, low and zero carbon energy projects (and their associated infrastructure).

⁴ Planning Policy Wales 2024. Available at: <https://www.gov.wales/planning-policy-wales>

⁵ Technical Advice Notes. Available at: <https://www.gov.wales/technical-advice-notes>

⁶ Powys LDP. Available at: [Adopted_Powys_LDP_Written_Statement_April_2018.pdf](#)

3 The EIA Process and Scoping

3.1 Need for an EIA

- 3.1.1 For certain types of development, the EIA Regulations require that an EIA must be undertaken before consent can be granted. Since 1st April 2019 132 kV OHL developments are considered a DNS project and are included in the infrastructure to be subject to the DNS process. Appendix 3: Environmental Impact Assessment of the DNS Procedural Guidance⁷ states that DNS applications are subject to the EIA Regulations and therefore, the criteria and thresholds outlined in Schedules 1-3.
- 3.1.2 The proposed development does not fall under the description of a Schedule 1 development, as defined by the EIA Regulations, which would automatically require an EIA. The proposed development also does not fall under the description of a Schedule 2 development, whereby the development would have to meet specific criteria or exceed thresholds to require an EIA.
- 3.1.3 The proposed development has the potential to cause environmental impacts which in the absence of mitigation, could result in potential significant effects. In line with Schedule 3 of the EIA Regulations and Regulation 5 (2) (a) which allows an applicant to submit an ES when applying for planning permission regardless of the nature of their proposed development, Green GEN Cymru has decided to undertake an EIA for the proposed development.
- 3.1.4 Operation of infrastructure at 132kV voltage within England and Wales is classified as 'Electricity Distribution'. These assets are in the main owned and operated by licenced Distribution Network Operators (DNOs). However, to increase competition in the electricity distribution market, Ofgem, as the energy regulator for Great Britain, now licences Independent Distribution Network Operators (IDNOs). Once licenced by Ofgem, IDNOs are able to develop, operate and maintain electricity distribution networks. IDNOs connect their networks onwards into the local distribution network or transmission network.
- 3.1.5 Green GEN Cymru has applied for an IDNO Licence and are anticipating a determination on the application in early 2024. This will enable Green GEN Cymru to move forward with its plans to design, develop and construct the most appropriate solution for connecting the new energy parks, ensuring the best solutions for the local area. It would also enable Green GEN Cymru to deliver efficient and reliable grid infrastructure in Wales, opening broader opportunities for connections in the future.
- 3.1.6 As with DNOs, an IDNO holds an electricity licence under Section 6(1)(c) of the Electricity Act 1989⁸ (hereafter referred to as 'the Electricity Act'). DNO and IDNO licences also share the same Standard Licence Conditions. This places specific requirements on an IDNO, including "the development, maintenance, and operation of an efficient, co-ordinated, and economical system for the distribution of electricity".
- 3.1.7 With oversight of the development of both the connection infrastructure promoted by Green GEN Cymru as well as the energy parks, Bute Energy Group will be able to ensure effective coordination between these two elements, enabling collaboration regarding technical and environmental considerations and delivering the most appropriate solution. As a Welsh company, and a prospective IDNO licence holder, Green GEN Cymru will be able to play a proactive role in the progression towards achieving Net Zero. Bute Energy Group will support the development of proposed energy parks and, will also be able to support the efficient and timely connection of future renewable energy projects demonstrating the benefits of the IDNO framework.

3.2 The EIA Process

- 3.2.1 The EIA process, as set out in the EIA Regulations, aims to ensure that the competent authorities and the public properly understand the likely significant environmental effects, and the scope for reducing them, before a consent is determined.

⁷ The Planning Inspectorate. (2019). Developments of National Significance. Available at: <https://www.gov.wales/sites/default/files/publications/2019-07/developments-of-national-significance-guidance-environmental-impact-assessment.pdf>

⁸ The Electricity Act 1989. Available at: <https://www.legislation.gov.uk/ukpga/1989/29/contents>

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- 3.2.2 The EIA process consists of a number of defined steps, of which the Scoping stage forms one part. Diagram 3.1 illustrates this process.
- 3.2.3 As shown in Diagram 3.1, EIA is an iterative process. An initial impact assessment of the proposed development, or proposed development options, is undertaken, on the basis of which mitigation and enhancement measures are identified and incorporated into the design of the proposed development, where possible. Such measures that become incorporated into the design are termed 'design interventions'.
- 3.2.4 At the routeing options appraisal stage, an appraisal of three route options was undertaken to identify environmental constraints. A preferred corridor option (Scoping Report Corridor) was selected following the route options appraisal, therefore avoiding, or minimising, potential environmental impacts.
- 3.2.5 Upon selection of a final route within the Scoping Report Corridor during the design development process, the final route option will then undergo a further impact assessment and, on the basis of this, additional mitigation and enhancement measures will be identified. The ES will include an assessment of residual effects which are those likely to arise after the proposed mitigation and enhancement has been applied.
- 3.2.6 Route options appraisal and the evolution of design of the proposed development will be discussed as part of Chapter 4: Consideration of Alternatives within the ES, and within individual technical chapters of the ES as appropriate.
- 3.2.7 To inform the proposed methodologies and assessment areas of the EIA, consultation with stakeholders will be undertaken throughout the EIA process. Consultation is a statutory requirement and will form part of the planning process.
- 3.2.8 This EIA Scoping Report is submitted to PEDW and made available to statutory consultees for formal consultation. Comments received by PEDW and from consultees will be used to confirm the scope of the EIA and content of the ES.
- 3.2.9 Technical discipline chapters will provide commentary on:
- Identified receptors and a description of current baseline conditions;
 - Assessment of the sensitivity of the receptors to change; and
 - Assessment of the likely potential impacts associated with the proposed development
- 3.2.10 Chapters will conclude with a paragraph stating whether the discipline will be considered further in the EIA. If scoped into the EIA, the methodology will be set out.

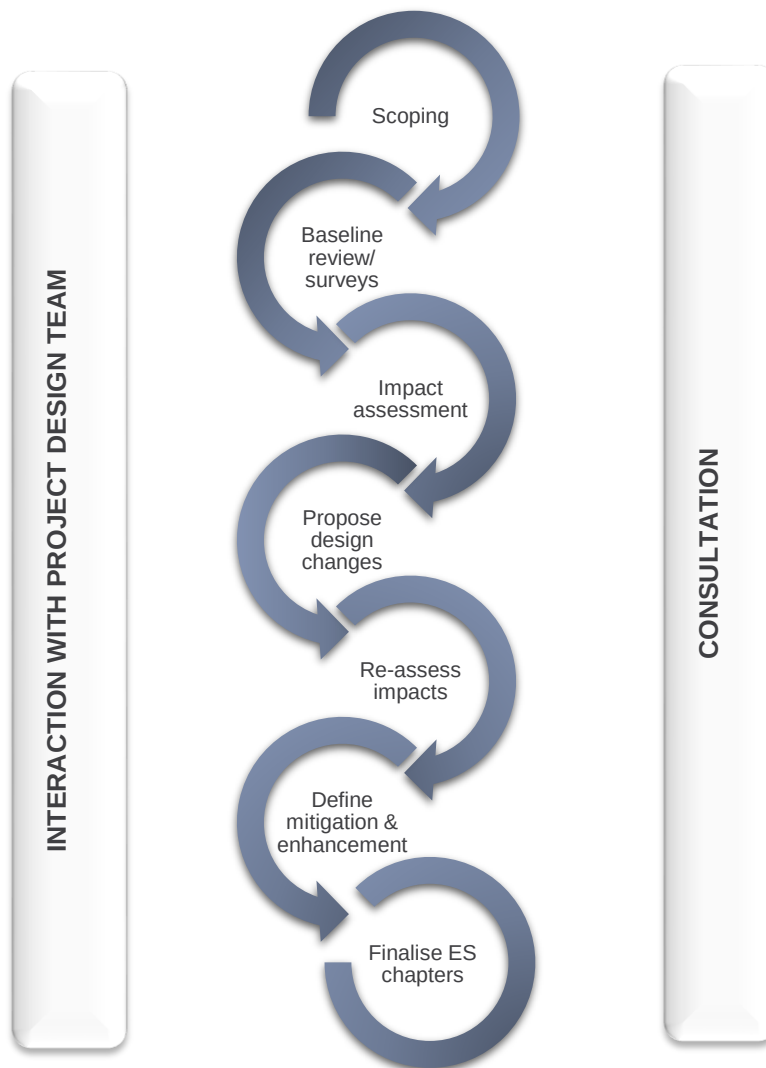


Diagram 3.1: EIA process

Maximum Parameters Approach

- 3.2.11 As consent for the proposed development is being sought for a final route that has not yet been finalised, this EIA Scoping Report will set out the potential for significant effects of each environmental discipline based on the Scoping Report Corridor.
- 3.2.12 The ES will assess the environmental effects associated with all phases collectively for the majority of the technical chapters where this represents a worst-case scenario. Where it is necessary to consider intervening scenarios as the proposed development is built out for a worst-case scenario, this is identified in the technical discipline chapter.
- 3.2.13 Maximum parameters have informed the approach proposed by this EIA Scoping Report. Such parameters will also form the basis for the EIA and will be set out in the ES. As design development continues the final assessed parameters may be subject to change.
- 3.2.14 Sensitive receptors for each technical discipline are specified within the respective chapters of this EIA Scoping Report. Receptors which are identified by multiple disciplines are as follows:
- Future site users;
 - Adjacent residents;
 - Adjacent commercial occupants;

- Construction workers;
- Controlled waters (surface water and underlying aquifers);
- Ecological designations and receptors; and
- Heritage assets.

- 3.2.15 This section sets out the significance criteria that have been applied by the technical disciplines in their assessment.
- 3.2.16 The EIA process is concerned with determining whether the likely impacts associated with the proposed development are deemed to have significant effects or not.
- 3.2.17 For some technical EIA disciplines, specific guidance exists, which details how the impact of a development should be assessed. In general, this involves an element of professional judgement with regard to the application of the guidance to the specific Scoping Report Corridor under consideration.
- 3.2.18 These guidance documents are often accepted as best practice and therefore will be used where available and appropriate in the EIA, along with professional judgement. The specific methodology to be adopted will be described within the relevant technical chapters within the EIA Scoping Report.

Assessing the Significance of effects in the EIA

- 3.2.19 This section sets out the significance criteria that have been applied by the technical disciplines in their assessment.
- 3.2.20 The EIA process is concerned with determining whether the likely impacts associated with the proposed development are deemed to have significant effects or not.
- 3.2.21 For some technical EIA disciplines, specific guidance exists, which details how the impact of a development should be assessed. In general, this involves an element of professional judgement with regard to the application of the guidance to the nature of the development under consideration.
- 3.2.22 These guidance documents are often accepted as best practice and therefore will be used where available and appropriate in the EIA, along with professional judgement. The specific methodology to be adopted will be described within the relevant technical reports.
- 3.2.23 Overall, the main approach will be based on the technical approach that significance reflects the relationship between two factors:
- The value or sensitivity of the affected receptor; and
 - The nature, magnitude or severity of the impact (i.e. the predicted change taking place to the environment).
- 3.2.24 The sensitivity, importance or value of the receptor is normally derived from:
- Its designated status within the land use planning system;
 - The number of individual receptors;
 - An empirical assessment on the basis of characteristics, such as rarity or condition; and
 - The ability of the receptor to absorb change.
- 3.2.25 In this report, 'impact' is used to describe the predicted magnitude or extent of environmental or social change as a result of the proposed development. The term 'effect' is used to describe the consequences of the impact in combination with the sensitivity of the affected receptor.
- 3.2.26 Therefore, 'effect' is based on two components: the magnitude of the impact multiplied by the sensitivity of the receptor. It is an important distinction that 'impact' is a constituent part of 'effect'.
- 3.2.27 The magnitude of an impact represents a level of certainty and the degree by which a particular receptor is compromised. Magnitude is often quantifiable in terms of, for example, the extent of land take, loss of biodiversity or predicted change in noise levels.
- 3.2.28 Thus, significant effects occur where valuable or sensitive receptors are subject to impacts of considerable magnitude. Effects are unlikely to be significant where low value or non-sensitive receptors are subject to minor impacts.

- 3.2.29 For all technical assessments where specific best practice guidance is not provided, the significance of the effects will be assessed based on the magnitude of the potential impact and the relative sensitivity of the identified receptors.
- 3.2.30 Table 3.1 sets out how impact magnitude and receptor sensitivity interact to provide the significance of the effect. Significant effects for the purposes of the EIA regulations are those predicted to be moderate or substantial.

TABLE 3.1: SIGNIFICANCE MATRIX- SIGNIFICANT EFFECTS HIGHLIGHTED IN BOLD

Receptor Sensitivity / Value	Impact Magnitude			
	Negligible	Minor	Moderate	Major
Low	Negligible	Negligible	Negligible	Slight
Medium	Negligible	Negligible	Slight	Moderate
High	Negligible	Slight	Moderate	Substantial
Very High	Slight	Moderate	Substantial	Substantial

- 3.2.31 The EIA Regulations stipulate that an ES should identify, describe and assess the likely significant effects of the proposed development on the environment, including the consideration of:
- Beneficial and adverse effects;
 - Short, medium and long term effects;
 - Direct and indirect effects;
 - Permanent and temporary effects; and
 - Cumulative effects and impact interactions.
- 3.2.32 The above considerations and terminology will be used when considering the significance of effects.
- 3.2.33 The assessment identifies and assesses the likely significant effects in relation to both the construction and operational phases of the proposed development. Environmental effects have been predicted with reference to definitive standards and legislation where available. Where it has not been possible to quantify effects, qualitative assessments have been carried out, based on available knowledge and professional judgement. Any associated limitations and uncertainties have been noted in the relevant assessment chapters.

Assessment of cumulative effects in EIA

- 3.2.34 The requirement to refer to the cumulative effects of the proposed development is included in Schedule 4(5) of the EIA Regulations, where it is stated, an ES should include: 'The description of the likely significant effects on the factors specified in regulation 4(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development'.
- 3.2.35 Chapter 18 describes in detail the proposed approach to assessment of cumulative effects.

3.3 EIA Scoping

Purpose of Scoping in the EIA Process

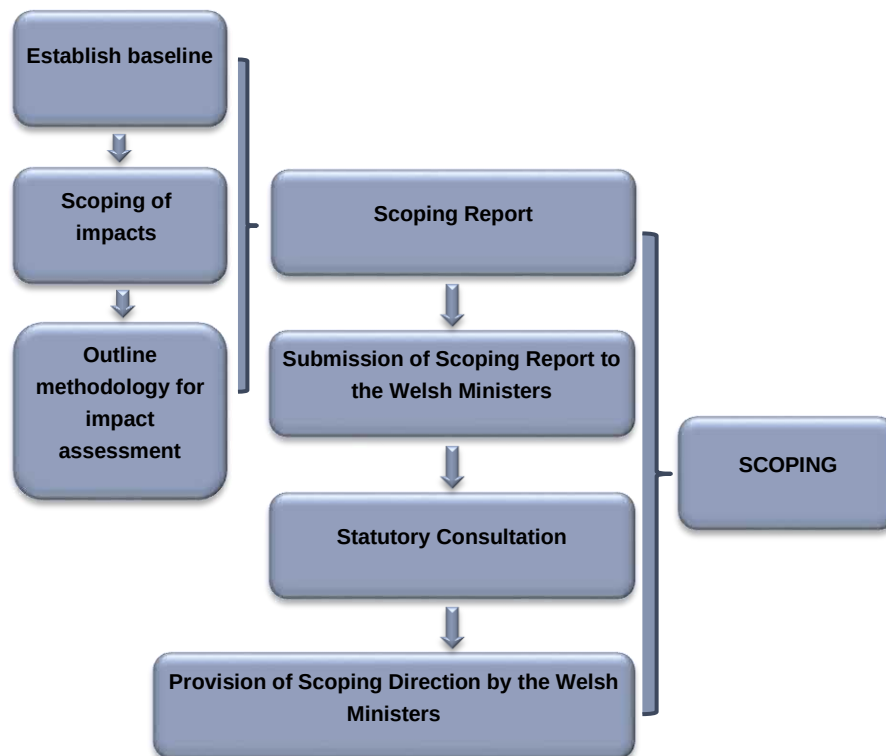
- 3.3.1 The primary purpose of the scoping stage is to define the extent of the subsequent EIA, ensuring that only potentially significant environmental effects are carried forward to the assessment. This enables the EIA to be focused on the most important environmental issues pertinent to the study area.
- 3.3.2 The scoping stage determines the topics or areas of potential likely impacts to be addressed, and the geographical area and timeframe over which they will be considered.
- 3.3.3 It also sets out the methods to be used by the EIA to determine the likely significant environmental effects, both temporary and permanent, that will arise during the project's construction and operation. The scoping process also enables certain potential impacts to be scoped out, as not being likely to give rise to significant environmental effects.
- 3.3.4 EIA Regulation 33 provides the applicant with the opportunity to seek a Scoping Direction from the Welsh Ministers, to confirm the information to be contained within the ES. This report sets out the proposed

scope of the ES, and will be submitted to PEDW and consulted upon, so that PEDW can provide a Scoping Direction. Therefore, this Scoping Report will form the basis for ongoing consultation on the EIA with statutory authorities and other relevant stakeholders. Its contents, having taken account of comments received during consultation, will be incorporated within the ES.

Scoping Methodology

- 3.3.5 The stages of EIA scoping are illustrated in Diagram 3.2 and the methodology for determining which impacts from the proposed development should be assessed in the EIA are described in subsequent sections.

Diagram 3.2: EIA Scoping Process



Establishing the Baseline

- 3.3.6 Initial baseline identification has been undertaken through the conduct of a desk-based study using all available information and surveys undertaken to date. A number of site walkovers and on-site surveys and investigations have also been undertaken. Sensitive receptors are also identified through this activity.

Scoping of Effects

- 3.3.7 Within this EIA Scoping Report, potential effects resulting from the proposed development have been identified on the basis of the following:
- Current understanding of the proposed development (including its operation and construction);
 - Site surveys and walkovers;
 - Review of readily available baseline information;
 - Reference to published guidance documents;
 - Reference to existing surveys and assessments undertaken to date; and
 - Knowledge, expertise and previous experience of the project team.
- 3.3.8 A qualitative assessment of the potential effects has been undertaken to determine which of the effects could be potentially significant and therefore, should be taken forward and assessed in the subsequent EIA.

- 3.3.9 The qualitative assessment has been undertaken in terms of the relationship between two factors:
- The magnitude of the potential impacts (direct or indirect), including the consideration of duration and reversibility; and
 - The importance of the receptor (the entity that is vulnerable to the effects of the impact), in terms of its value and sensitivity to the impact.
- 3.3.10 A list of sensitive receptors on which potentially significant effects could occur, as a result of the magnitude of the impact and the sensitivity of the identified receptor, is also provided as appropriate.
- 3.3.11 The sensitivity, importance or value of the receptor is normally derived from:
- Its designated status within the land use planning system; and
 - The number of individual receptors.
- 3.3.12 Where items have been scoped out of the EIA, a justification for this is provided.

Methodology for Impact Assessment

- 3.3.13 A summary of the proposed methodology to be used for each technical discipline scoped into the report is outlined, in line with relevant guidance documents, within each individual chapter. The temporal, spatial and technical scope of the assessment is defined and reference to consultation made (as appropriate), where this is proposed or has already been undertaken.

3.4 Topics addressed in EIA Scoping Report

- 3.4.1 The following technical disciplines are considered relevant to be addressed as part of this scoping exercise:
- Transport and Access
 - Air Quality
 - Noise and Vibration
 - Ecology
 - Landscape and Visual Impact
 - Cultural Heritage and Archaeology
 - Land Quality
 - Soils and Agriculture
 - Material Assets and Waste
 - Flood Risk, Hydrogeology and Hydrology
 - Socioeconomics
 - Health and Wellbeing
 - Climate Change
 - Electromagnetic Fields
 - Major Accidents and Disasters
 - Cumulative Effects

4 Transport and Access

4.1 Introduction

- 4.1.1 This chapter of the Scoping Report identifies potential impacts with regard to transport and access that may occur during the construction and operation of the proposed development and outlines whether these will be assessed further in the ES.

4.2 Baseline

- 4.2.1 The Scoping Report Corridor is located within the county of Powys and commences approximately 2km north west of Tan-y-Foel Quarry close to existing buildings known as Bryngwyn in mid Wales; and extends south from this point then west, to the village of Llangurig. At its widest point, the Scoping Report Corridor is approximately 1690 m and at its narrowest point approximately 290 m. The Scoping Report Corridor crosses communities including Clatter, Trefeglwys and Llanidloes.
- 4.2.2 The study area for the assessment comprises the area directly affected by the proposed development and will be finalised and presented in the ES once the proposals have progressed and pole locations have been identified. The study area will include all highways within the Scoping Report Corridor plus those providing connections to the wider highway network which are likely to experience increases in traffic flows. For the purposes of this Scoping Report, the study area is assumed to include the following highways:
- A roads:
 - A470 (T)
 - B roads:
 - B4569, B4518
 - C roads:
 - C2159, C2067, C2180, C2069, C2022, C2194, C2024, C2188, C2079, C2075
 - Unclassified local roads
 - U2330, U2554, U2555, U2577, U2766, U2768, U2769, U2781, U2784, U2785, U2765, U2759, U2758

4.3 Receptors

- 4.3.1 The key potential receptors that are sensitive to the potential impact of a traffic increase are identified as follows:
- People at home;
 - People in places of employment;
 - Sensitive groups such as children, elderly and disabled;
 - Sensitive locations such as hospitals, churches, schools, historical buildings;
 - People walking;
 - People cycling;
 - Open spaces, recreational sites, shopping areas;
 - Sites of ecological/nature conservation value; and
 - Visitor / tourist attractions.
- 4.3.2 The relevant receptors will be identified once details of construction generated traffic and access routes are confirmed.

4.4 Scoping of Impacts

- 4.4.1 Table 4.1 and Table 4.2 present a summary of the proposed scope of assessment. They identify which likely environmental effects, with respect to transport and access will be assessed in the ES (i.e.

considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out). Professional judgement has been used to decide what is to be scoped in/scoped out of the assessment.

TABLE 4.1: POTENTIAL TRANSPORT AND ACCESS IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Disruption to local traffic patterns	Yes	Implementation of traffic management arrangements to facilitate the formation of the temporary construction accesses which could increase driver delays on roads local to the Scoping Report Corridor.
Construction traffic	Yes	There may be noticeable traffic increases on roads local to the Scoping Report Corridor associated with the construction activities, which could result in short term increases in driver delays and potentially pedestrian severance.

TABLE 4.2: POTENTIAL TRANSPORT AND ACCESS IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Operational traffic	No	The traffic levels associated with the proposed development are anticipated to be very low being limited to the occasional visit by a routine maintenance/inspection vehicle. An assessment of the operational impacts will therefore be scoped out.

4.5 Methodology for Impact Assessment

Scope

- 4.5.1 The scope of this assessment is to illustrate the routes to be used and / or otherwise affected by generated traffic by the proposed development, estimate traffic volumes, and provide an assessment of the resulting environmental effects. It is anticipated that the only potentially significant generation of vehicle movements will occur during the construction phase.

Guidance

- 4.5.1 The environmental impacts of the proposed development generated traffic will be assessed with reference to the "Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (EATM)"⁹.
- 4.5.2 Reference will be made to guidance provided in the Design Manual for Roads and Bridges (National Highways, Welsh Government, 2020)¹⁰ and the Manual for Streets (Department for Transport, HMSO, 2007)¹¹, as required.

Consultation

- 4.5.3 The assessment will consider the potential impacts on a highway network of interest defined during the scoping discussions to be held with Powys County Council (PCC) and the Welsh Ministers where relevant. The consultation will cover the highway network of interest, access strategy, the future flows scenarios to be considered, consented and committed developments and trip distribution methodology and the cumulative impacts assessment in respect of any other development in the vicinity as agreed with PCC.

⁹Institute of Environmental Assessment. (2023). Environmental Assessment of Traffic and Movement

¹⁰ National Highways, Welsh Government. (2020). Design Manual for Roads and Bridges

¹¹ Department for Transport, HMSO. (2007) Manual for Streets

- 4.5.4 The assessment will consider the need for mitigation works and routeing options during the construction phase to be agreed with PCC.

Approach to assessment

- 4.5.5 As indicated, the environmental impacts of the proposed development generated traffic will be assessed with reference to EATM and using professional judgement, as appropriate. The data underpinning the assessment will be obtained from new traffic surveys as required. The need for, and scope of, traffic surveys will be discussed in consultation with the relevant local highways authorities as the project design progresses and further information on construction vehicle quantum and routeing becomes available.
- 4.5.6 In addition, several site-specific baseline studies will be undertaken to inform the assessment, including:
- Site visits to identify the key characteristics of the highway network of interest;
 - Details of public transport services;
 - Details of existing pedestrian, cycle and equestrian routes; and
 - Personal Injury Collision statistics for the highway network of interest.
- 4.5.7 The construction assessment year and the respective flow scenarios will be agreed with PCC as part of the scoping discussions. The assessment will take account of any agreed traffic flows for consented and committed developments likely to impact on the network of interest as agreed with PCC.

5 Air Quality

5.1 Introduction

- 5.1.1 This chapter of the Scoping Report identifies the potential for local air quality impacts that may occur during the construction and operation phases of the proposed development and outlines whether these will be addressed further in the ES.

5.2 Baseline

- 5.2.1 The Scoping Report Corridor is located in a rural area where air quality is expected to be good. There are no major industrial or combustion pollution sources within or near to the Scoping Report Corridor. There is an open-cut quarry (H V Bowen & Sons (Quarry) Ltd), located approximately 40 m from the north-eastern Scoping Report Corridor and may be a potential local source of fugitive dust.

Local Air Quality Management

- 5.2.2 PCC is responsible for the review and assessment of local air quality as part of the Local Air Quality Management (LAQM) framework set by the Environment Act 1995, as amended by the Environment Act 2021. The annual reviews by PCC enable PCC to report on local air quality within the context of relevant national air quality objectives set for the protection of human health and ecosystems, as contained in the Air Quality (Wales) Regulations 2000.
- 5.2.3 The pollutants and associated objectives that form the focus of this scoping chapter are presented in Table 5.1. Where an objective is met, the respective local authority must designate an Air Quality Management Area (AQMA).

TABLE 5.1: RELEVANT AIR QUALITY OBJECTIVES SET FOR THE PROTECTION OF HUMAN HEALTH AND ECOSYSTEMS

Pollutant	Averaging Period	Concentration ($\mu\text{g}/\text{m}^3$)	To be achieved by
Human Health			
Nitrogen Dioxide (NO₂)	Annual mean	40	31st December 2005
	1-hour mean	200 (not to be exceeded more than 18 times per year)	31st December 2005
Particulate Matter (PM₁₀)	Annual mean	40	31st December 2004
	24-hour mean	50 (not to be exceeded more than 35 times a year)	31st December 2004
Particulate Matter (PM_{2.5})	Annual Average	20	1st January 2020
Ecosystems			
Nitrogen Oxides (NO_x)	Annual mean	30	31st December 2000

- 5.2.4 The most recent Annual Status Report (ASR) of air quality published by PCC at the time of undertaking this assessment is the 2022 ASR12, which reports local air quality monitoring results up to the end of 2021. The ASR states that '...the monitoring data collected for 2021 did not identify any requirement to

¹² Powys County Council, 2024. *Air Quality* [Online] Available at: <https://en.powys.gov.uk/article/7201/Air-Quality>. (Accessed: 20 February 2024)

undertake a Detailed Assessment or for the declaration of an AQMA'. The report also confirmed PCC '...does not have any AQMAs'.

- 5.2.5 The nearest local air pollutant monitoring site operated by PCC is greater than 20 km to the east of the Scoping Report Corridor in Welshpool. The ASR states that '*...as Powys is a largely rural county Air Quality is generally good, and there are no policies or strategies that have been produced that specifically focus on Air Quality*'. In the absence of representative monitoring local to the proposed development, baseline air quality has been reviewed based on published data by the Department for Environment Food and Rural Affairs (Defra), as presented below.

Defra Background Air Pollution Data

- 5.2.6 The UK-AIR: Air Information Resource operated by Defra¹³ includes computer modelled predictions of background air pollutant concentrations over the whole of the UK with a grid resolution of 1 km². Background concentrations are those levels that would be observed away from specific sources such as roads and industry.
- 5.2.7 Defra data for NO_x, NO₂, PM₁₀ and PM_{2.5} relevant to the grid squares encompassing the Scoping Report Corridor are summarised in Table 5.2 for the current year (2024) and a future year (2028).

TABLE 5.2: DEFRA BACKGROUND ANNUAL MEAN CONCENTRATIONS AT THE SCOPING REPORT CORRIDOR (2024)

Pollutant	2024 Concentrations (µg/m ³)			2028 Concentrations (µg/m ³)		
	Average	Max	Min	Average	Max	Min
NO _x	3.7	5.6	3.4	3.4	5.2	3.2
NO ₂	3.0	4.5	2.7	2.8	4.2	2.6
PM ₁₀	8.3	10.4	8.1	8.1	10.3	7.9
PM _{2.5}	5.3	5.9	5.2	5.2	5.8	5.1

- 5.2.8 The current and future background air pollutant concentrations within and near to the Scoping Report Corridor are expected to remain well below the respective air quality objectives.

5.3 Receptors

- 5.3.1 Human receptors that are potentially sensitive to changes in local air quality include residential properties and other areas where the public might reasonably be expected to spend extended periods of time (e.g. open public spaces, schools, and health centres). The presence of sensitive receptors within 250 m of the Scoping Report Corridor was screened, primarily with respect to potential for dust emissions that could be generated during the construction phase, with reference to relevant Institute of Air Quality Management (IAQM) guidance¹⁴.
- 5.3.2 This identified a total of 501 residential dwellings or lodgings (i.e. caravan parks, holiday lets), and one school (Ysgol Dyffryn Trannon) within 250 m of the Scoping Report Corridor. Of those, 24 residential dwellings were identified within 250 m of the Scoping Report Corridor where underground cabling activities would occur specifically.
- 5.3.3 The receptors identified within 250 m of the Scoping Report Corridor are depicted in Figure 5.1. The receptors identified within 50 m of Scoping Report Corridor are depicted in Figure 5.2. This screening represents a conservative approach given the precise location of construction and operation activities associated with the proposed development are not known at this stage.
- 5.3.4 There are no air quality sensitive ecological receptors within 250 m of the Scoping Report Corridor.

¹³ DEFRA, 2018. *Background Mapping data for local authorities - UK-Air*. [Online]. Available at: <https://uk-air.defra.gov.uk/data/iaqm-background-maps?year=2018>. (Accessed: 14 February 2024).

¹⁴ IAQM, 2024. *Guidance on the assessment of dust from demolition and construction*. [Online]. Available at: <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>. (Accessed: 16th February 2024)

5.4 Scoping of Impacts

- 5.4.1 A summary of the scoping of impacts is presented in Table 5.3 and Table 5.4 for the construction and operational phases of the proposed development, respectively. Each table identifies which likely environmental effects will be assessed in the EIA (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 5.3: POTENTIAL AIR QUALITY IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Temporary emissions of dust and particulate matter from construction activities affecting human/ecological sensitive receptors in the vicinity of the Scoping Report Corridor.	No	Although the proposed construction works will include the erection of wooden poles 'H' poles to facilitate the overhead electric line, the potential for significant effects from fugitive dust emissions will be negligible and temporary in nature. Whilst part of the proposed development will require underground cabling, which will require relatively greater material disturbance and has a greater potential to release fugitive dust, there are a low number of sensitive receptors dispersed within the Scoping Report Corridor and standard best practice dust mitigation measures will ensure there are no significant air quality effects. A construction dust risk assessment will be appended to the CEMP to ensure the appropriate level of dust mitigation is applied to the construction activities. There are no air quality sensitive ecological receptors within 250 m of the Scoping Report Corridor. Therefore potential impacts on ecological receptors are scoped out.
Temporary impact on air quality from exhaust emissions from construction traffic and on-site plant affecting human/ecological receptors in the vicinity of the Scoping Report Corridor.	No	Given the nature of the proposed development and existing baseline conditions, exhaust emissions from the likely low number of construction vehicle movements will not result in a material impact on local air quality. Similarly, the number of on-site plant will be minimal and their use will be temporary and intermittent, thus will not result in a material impact on local air quality. Nonetheless, the draft CEMP will include measures to promote the use of low emission plant and construction vehicles that meet appropriate emissions standards.

TABLE 5.4: POTENTIAL AIR QUALITY IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Impact on air quality from exhaust emissions (NO ₂ , PM ₁₀ and PM _{2.5}) from operational traffic affecting sensitive human/ecological receptors in the vicinity of the Scoping Report Corridor.	No	Given the nature of proposed development and existing good air quality within and near to the corridor, traffic flows generated by the operational phase will not be material and the local air quality impact will be imperceptible.

- 5.4.2 On the basis of the scoping exercise in tables 5.3 and 5.4, air quality is scoped out of the EIA. However, a construction dust risk assessment will be undertaken and appended to the draft Construction Environmental Management Plan (CEMP), which will ensure the appropriate level of dust mitigation is applied during construction phase activities.

5.5 Methodology for Construction Dust Risk Assessment

- 5.5.1 Although Air Quality is scoped out of the EIA, a construction dust risk assessment will be completed to determine the appropriate construction phase dust mitigation measures to be included in the draft CEMP.
- 5.5.2 The dust risk assessment will be completed with reference to the Institute of Air Quality Management (IAQM) publication – Guidance on the assessment of dust from demolition and construction (January 2024, Version 2.2)¹⁴. Specifically, the assessment will consider the potential dust generating activities likely to be undertaken, including earthworks, construction and trackout activities, as well as the duration of those activities and the scale of the construction site. This will allow the potential dust emission magnitude for each activity to be identified.
- 5.5.3 This information will be reviewed along with the prevailing air quality and meteorological conditions and proximity of sensitive receptors to the construction activities (i.e. within 250 m) to define the sensitivity of the area to dust. The IAQM guidance provides matrices that allow the dust emission magnitude and sensitivity of the area to be used to assign the appropriate level of risk of dust impact from each activity type.
- 5.5.4 The identified level of dust risk is used to determine the appropriate level of site-specific mitigation, which will be included within the CEMP for the proposed development. The IAQM guidance states that “...for almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’.”
- 5.5.5 Given the nature and location of the proposed development, combined with the existing good air quality conditions, it is expected that the application of effective dust mitigation will ensure that the effect of construction activities on local air quality will be not significant.

6 Noise and Vibration

6.1 Introduction

- 6.1.1 This section of the Scoping Report identifies potential impacts with regard to noise and vibration that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the Environmental Statement (ES).

National Policy

- 6.1.2 Planning Policy Wales (PPW)¹⁵ sets out the land use planning policies of the Welsh Government, with its primary objective being to ensure the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. In context of the proposed development paragraph 6.7.6 states that:

“In proposing new development, planning authorities and developers must, therefore:

- *Address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors.*
- *Not create areas of poor air quality or inappropriate soundscape; and,*
- *Seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.”*

- 6.1.3 The guidance in PPW is supplemented by a series of Technical Advice Notes (TAN), of which TAN 1116 is relevant to Noise. This document was revised initially in 2015 (CL-01-15)¹⁷ with another proposed revision currently under review. The version referred to in this chapter is the 1997 document (with 2015 amendments) as it is the current adopted version.

- 6.1.4 TAN 11 sets out the approach to considering noise when planning a new development, be it noise-generating, or noise-sensitive.

- 6.1.5 The document states that ‘developers should, as a matter of course, follow all relevant codes of practice, guidelines and standards (e.g. BS 5228:2009+A1:2014^{21,22}) to prevent significant adverse impacts and minimise adverse impacts during the construction phase of any development project. Planning authorities should ensure the impacts associated with construction phases can be adequately controlled.’

- 6.1.6 The Welsh Government’s Noise and Soundscape Action Plan (2018 – 2023)²⁰ sets out aims to create appropriate soundscapes for health and acoustic comfort depending on context and location, with the intent of achieving national ‘well-being goals’ (paragraph 1.2.1 of the guidance). The document states that for construction noise ‘BS 5228:2009+A1:2014^{21,22} refers to the need for the protection against noise and vibration of persons living and working in the vicinity of, and working on, construction and open sites. Noise and vibration can cause serious disturbance and inconvenience to anyone exposed to them and to processes and activities in neighbouring buildings. In extreme circumstances vibration can cause or contribute to building damage.’

Local Policy

- 6.1.7 A consultation with PCC for the proposed assessment will be undertaken with Officers at PCC in relation to the construction noise assessment.

¹⁵ Planning Policy Wales, Edition 12, February 2024, Welsh Government, UK

¹⁶ Planning Guidance (Wales) Technical Advice Note (Wales) 11 Noise, 1997, Welsh Government, UK

¹⁷ Letter to all Local Authority Cabinet Members with Responsibility for Planning dated 25th November 2015 from Carl Sargent AC/AM Minister for Natural Resources., Available at <https://www.gov.wales/sites/default/files/publications/2018-11/cl0115-tan-11-noise.pdf>

¹⁸ BS 5228-1 ‘Code of practice for noise and vibration control on construction and open site – Part 1: Noise’ 2009 +A1:2014

¹⁹ BS 5228-2 ‘Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration’ 2009 +A1:2014

²⁰ Noise and soundscape action plan 2018-2023, 2018, Welsh Government, UK

²¹ BS 5228-1 ‘Code of practice for noise and vibration control on construction and open site – Part 1: Noise’ 2009 +A1:2014

²² BS 5228-2 ‘Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration’ 2009 +A1:2014

6.1.8 Planning policy for Powys is outlined in the Local Development Plan 2011 – 2026²³. This document sets out the overall planning policy and approaches to be undertaken when considering new developments.

6.1.9 In particular, Policy 4.10.13 states the following:

“All renewable energy proposals and associated infrastructure, such as power lines or battery storage facilities, must respect the existence and amenities of neighbouring residential and sensitive properties including approved development. This is particularly the case when it comes to ‘shadow flicker’, reflected light or noise from wind turbines, ‘glint and glare’ from solar developments, and odour associated with anaerobic digestion.”

6.2 Baseline

6.2.1 A desk study of the Scoping Report Corridor suggests that there won’t be one overall dominant noise source in terms of existing soundscape. The proposed development crosses the A470 twice, north-west of Clatter and north-east of Llanidloes and also crosses the B4569 north-west of Trefeglwys. At these locations, noise from road traffic will likely be the dominant noise source for nearby receptors. Larger villages will likely produce a small amount of industrial/commercial noise associated with local businesses; however, this is anticipated to be localised in any noise effects it may have. The local environment will also be made up of rural sources (for example associated with farming equipment and livestock) as well as the local road network and high-altitude aircraft noise.

6.2.2 A review of the DataMapWales²⁴ website, which presents predicted noise levels based on the requirements of the 2022 round of noise mapping²⁵, confirms that as stated above the dominant source of noise in the area is associated with road traffic. With regard to the scheme area, in the vicinity of trunk roads (i.e. A470) and main routes (i.e. B4569) the $L_{Aeq,16h}$ noise levels are predicted to be >50dB, however there are large areas where noise levels are predicted to be below 40dB $L_{Aeq,16h}$.

6.3 Receptors

6.3.1 As part of the desktop study, noise sensitive locations (such as individual or groups of dwellings) were identified and are listed in Table 6.1 below. Depending on the finalised route, this list of locations will all or in part be used in the noise assessment.

TABLE 6.1: POTENTIAL RECEPTORS AND CO-ORDINATE LOCATIONS

Receptor Description	Co-ordinates (Northing and Eastings)
Gwaun Y Maglau, Welshpool SY21 0AW	302457, 299953
Isolated dwelling	301439, 300399
Properties around the Nantg Dol-y-Llyn river in Caersws	297081, 298601
Properties around the A470/A489 north of Clatter	295212, 299635
Properties north of B4569 by the Nant Colwyn (Colwyn Stream)	292396, 298572
Properties west of Trefeglwys and the B4569	290707, 297871
Lower Bwlch-y-Llyn, located west of Llyn Ebyr (Lake Ebyr)	288380, 296769
Properties north and south of the A470, east of Llanidloes	285139, 298686
Properties by the B4518 south-east of Llanidloes	283025, 296547
Properties east of the A470 north of Langurig	280994, 294146
Properties North of Llangurig between the proposed Banc Du Energy and Rhiwlas Energy Park	281059, 291426

6.4 Scoping of Impacts

6.4.1 Table 6.2 and Table 6.3 identify which potential environmental impacts, with respect to construction and operational noise and vibration respectively, will be assessed as part of the EIA. Those impacts that are considered to have the potential for significant effects are scoped into the assessment.

²³ Powys Local Development Plan 2011 -2026, Adopted April 2018, Cyngor Sir Powys County Council, UK

²⁴ https://datamap.gov.wales/maps/new?layer=geonode:Environmental_Noise_Mapping_2022#/

²⁵ As required by The Environmental Noise (Wales) Regulations 2006 (<https://www.legislation.gov.uk/wsi/2006/2629/contents>)

TABLE 6.2: POTENTIAL NOISE AND VIBRATION IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Noise from demolition and construction activities	Yes	Construction and demolition activities and associated plant have the potential to generate high noise levels. These works would potentially cause noise disturbance given the close proximity to noise sensitive receptors.
Vibration from demolition and construction activities	Yes	Certain construction activities have the potential to generate vibration levels that could result in a disturbance at surrounding receptors.
Construction road traffic	Yes	Increased construction traffic noise as a result of HGV's has potential to affect receptors near the existing road links and site access routes.
Noise from operational activities	Yes	It is assumed that a limited level of noise could be produced by the overhead lines and so a tier 1 assessment outlined in the National Grid Policy Statement PS(T) 134 ²⁶ will be undertaken. The tier 1 assessment will determine whether a tier 2 assessment should be undertaken.

TABLE 6.3: POTENTIAL NOISE AND VIBRATION IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Noise from operational activities	Yes	It is assumed that a limited level of noise could be produced by the overhead lines and so a tier 1 assessment outlined in the National Grid Policy Statement PS(T) 134 ²⁷ will be undertaken. The tier 1 assessment will determine whether a tier 2 assessment should be undertaken.
Vibration from operational activities	Yes	Limited vibration is expected due to the nature of the operation of the development.
Noise and vibration from periodic maintenance	No	No noise or vibration effects are expected due to the periodic maintenance of the operational equipment.

6.5 Methodology for Impact Assessment

6.5.1 Consultation with PCC will be undertaken regarding proposed assessment methodology and noise survey prior to them commencing.

Determination of Baseline

6.5.2 Where appropriate, the baseline conditions at potential local sensitive receptors (see Table 6.1), and within the Scoping Report Corridor will be determined through noise measurements of baseline conditions and existing sources. This information will then be used inform a noise propagation model using the Datakustik Cadna/A sound propagation modelling software. The software carries out sound propagation predictions in accordance with ISO 961328.

6.5.3 Baseline noise surveys will be undertaken within the Scoping Report Corridor and these will be used to establish the existing noise levels in the vicinity of the proposed route and verify the modelling to support the construction noise assessment.

6.5.4 Up to 12 locations over the scheme area will be selected based on their proximity to areas that are noise sensitive (for assessment) or are locations where there are existing sources (such as roads, for source

²⁶ National Grid Policy Statement (Transmission) 134, "Operational Audible Noise policy for Overhead Lines (New Build, Reconductoring, Diversion and Upgrading)", Issue 2, June 2021, National Grid

²⁷ National Grid Policy Statement (Transmission) 134, "Operational Audible Noise policy for Overhead Lines (New Build, Reconductoring, Diversion and Upgrading)", Issue 2, June 2021, National Grid

²⁸ ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation' 1996.

noise measurements). Prior to the noise survey being undertaken, the proposed locations will be discussed with PCC. Depending on both the purpose of the measurements at the specified location and the outcome of the consultation with the local authority, the measurement duration could range from 24 hours up to seven days.

Construction Noise

- 6.5.5 Assessments of construction noise and vibration will be carried out in accordance with BS 5228 Parts 1 and 2. This standard gives advice on the assessment of construction noise and vibration levels and presents typical thresholds for levels of construction site noise and vibration at residential locations during construction working hours.
- 6.5.6 BS 5228 contains a number of example methodologies for identifying significant construction noise effects based on fixed thresholds or noise level changes. For the purposes of this assessment the 'ABC' method is proposed to be adopted. This will be clarified during consultation with PCC's Environmental Health department.

TABLE 6.4: EXAMPLE THRESHOLD OF POTENTIAL SIGNIFICANT EFFECT AT DWELLINGS

Assessment category and threshold value period	Threshold value, in decibels (dB) (LAeq,T)		
	Category A	Category B	Category C
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends (19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

- 6.5.7 Category A threshold values are to be used when ambient noise levels (when rounded to the nearest 5dB) are less than these values. The same approach is taken for Category B and C.

Construction Vibration

- 6.5.8 Although significant impacts are not anticipated, as no defined route for the overhead line or tunnel has been finalised, the need for an assessment of vibration due to the construction works cannot be scoped out at this point.
- 6.5.9 Vibration levels generated by construction activities have the potential to impact upon sensitive receptors within the scheme area. BS 5228: 2009+A1: 2014 Part 229 presents methodologies to assess and control vibration emission levels from a construction site. The standard also presents tables of historic measurement data which can be referenced.
- 6.5.10 Typical construction activities will be assessed by referring to typical distances at which vibration emissions become perceptible. Where possible, predictions of vibration emissions will be carried out, however methods are only available for compaction, vibratory rollers, and certain piling types.
- 6.5.11 The impact of vibration will be assessed in terms of the Peak Particle Velocity (PPV), as per the Table 6.5 below.

TABLE 6.5: CONSTRUCTION VIBRATION CRITERIA

Vibration Level, mms-1 PPV	Magnitude of Impact
>10.0	High
1.0 - 10.0	Medium
0.3 - 1.0	Low
>0.3	Very Low

²⁹ British Standards Institute, BS 5228:2009 +A1:2014 'Code of practice for noise and vibration control on construction and open sites –Part 2: Vibration', 2014, BSI

Operational Noise

- 6.5.1 Within the proposed development, operational noise is anticipated to result only from the new OHL and with noise from them occurring only in certain atmospheric conditions.
- 6.5.2 Noise from OHL is separated in to 'Dry noise' and 'Wet noise' which is defined clearly in the National Grid Technical Report TR(T)94³⁰ as the following:
- Dry noise is caused by the quality and cleanliness of the OHL and worsens when wind-borne debris sticks to the OHL. Dry noise, therefore, worsens during long spells of dry weather as the debris builds up and decreases again after heavy rain when the debris is washed away; and
 - 'Wet noise' is audible noise during wet weather when water droplets land on the energised conductors (the OHL) and distort under the electric field and causing localised enhancement of the electric stress, thus initiating corona discharge activity and, hence, creates an audible noise.
- 6.5.3 The assessment of potential operational noise impacts will be undertaken in accordance with National Grid Policy Statement PS(T) 134. Given the rural nature of the area covered by the Scoping Report Corridor it is anticipated that the assessment will be limited to a Tier 1 noise assessment.
- 6.5.4 The Tier 1 assessment is defined in PS(T) 134 as a primary screening step that considers noise levels at nearest receptors, based on propagation of 'worst-case' wet noise against pre-determined assessment criteria. These criteria are shown in Table 6.6 below.

TABLE 6.6: TIER 1 NOISE IMPACT CRITERIA (WET NOISE)

Use	No Adverse Impact	Further Assessment Necessary
	Screen Out	Tier 2 Assessment Required
Vulnerable Subgroups	<29dBA	≥29dBA
Residential	<34dBA	≥34dBA
Schools and Hotels	<39dBA	≥39dBA

- 6.5.5 Although it is not anticipated to do so, should further assessment be identified as necessary the methodologies set out in both PS(T) 134 and TR(T) 94 would be followed in order to predict the level of impact at nearby noise sensitive receptors.
- 6.5.6 There is also potential for limited levels of noise to be generated by the periodic maintenance of the operational equipment, however these events are likely to be very short in duration, unlikely to involve mechanised (noise generating) equipment for long periods of time and although scheduled, will occur infrequently. It is considered therefore that assessment of potential impacts from the periodic maintenance can be scoped out.

6.6 Climate Change Adaptation and Resilience

- 6.6.1 It is expected that climate change will not have a material impact on the significance of any noise and vibration effects.

³⁰ National Grid Technical Report TR(T) 94, Issue 1, "A Method for Assessing the Community Response to Overhead Line Noise", October 1993, National Grid Company, UK

7 Ecology

7.1 Introduction

- 7.1.1 This section of the Scoping Report identifies potential impacts with regard to ecology that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.

7.2 Baseline

- 7.2.1 The proposed development runs through a farmed, rural landscape comprising rolling hills and valleys (National Landscape Character Areas 19 (Severn Valley), 20 (Radnorshire Hills) and 21 (Cambrian Mountains³¹). A short stretch of the northern section runs through partially enclosed upland moorland, whilst the majority of the route passes through pastoral land with frequent woodlands and mature trees, together with a network of hedgerows and watercourses within the surrounding landscape.
- 7.2.2 No ecological surveys have yet been undertaken within the Scoping Report Corridor to inform the proposed development. However, information on DataMapWales³² and aerial imagery suggests that the dominant habitat types within the Scoping Report Corridor are likely to comprise improved and semi-improved grasslands in pastoral agricultural use.

Designated nature conservation sites

- 7.2.3 There are no statutory designated nature conservation sites within the Scoping Report Corridor, however nine are located within the maximum relevant zone of influence of the proposals (2 km):
- One Special Area of Conservation (SAC); River Wye / Afon Gwy SAC, located approximately 0.9 km from the Scoping Report Corridor at its closest point.
 - Eight Sites of Special Scientific Interest (SSSI), the closest being Coed Mawr SSSI, located approximately 20 m from the Scoping Report Corridor.
- 7.2.4 There are two non-statutory designated Wildlife Sites (WS) within the Scoping Report Corridor:
- Tan-Llwyn Bog, located adjacent to the A470 within the Scoping Report Corridor.
 - Prospect Wood, located at the edge of the Scoping Report Corridor, near Newchapel.
- 7.2.5 A further four WSs and three Road Verge Nature Reserves are located within 2 km of the Scoping Report Corridor.
- 7.2.6 Important Curlew Area 9 covers a large area of the Scoping Report Corridor.

Habitats of principal importance

- 7.2.7 An initial desk study has identified the following potential habitats of principal importance for the conservation of biodiversity in Wales (Section 7, Environment Wales Act (EWA), 2016) within the Scoping Report Corridor:

³¹ Natural Resources Wales. (n.d.). National Landscape Character Areas (NLCA) Available at: Natural Resources Wales / National Landscape Character Areas (NLCA)

³²Welsh Government. (n.d.). Data Map Wales. Available at: [Home | DataMapWales \(gov.wales\)](https://gov.wales/data-map-wales)

- Lowland dry acid grassland;
- Purple moor grass and rush pasture;
- Upland heathland;
- Wood pasture;
- Traditional orchards;
- Lowland fens and reedbeds;
- Hedgerows; and
- The Welsh Peatland Data Portal shows a number of potential small areas of deep peat within the Scoping Report Corridor, which may comprise peatland habitats.

Ancient woodland and veteran trees

- 7.2.8 Reference to DataMapWales data indicates the presence of numerous areas of ancient woodland, restored ancient woodland and plantation on ancient woodland within the Scoping Report Corridor.
- 7.2.9 Reference to the Woodland Trust Ancient Tree Inventory reveals a number of veteran and ancient trees within the Scoping Report Corridor.

Ponds and watercourses

- 7.2.10 An assessment of aerial imagery and OS maps identified 35 potential ponds within the Scoping Report Corridor and 0.3 km buffer.
- 7.2.11 There are numerous watercourses within the Scoping Report Corridor, including the Afon Trannon and Afon Hafren (River Severn).

7.3 Receptors

- 7.3.1 The likely key potential receptors have been identified as follows:
- Designated nature conservation sites (statutory and non-statutory);
 - Terrestrial habitats on the Scoping Report Corridor, including those of principal importance for the conservation of biodiversity in Wales (Section 7, EWA, 2016), ancient woodland, veteran trees and ground water dependent terrestrial ecosystems (GWDTEs);
 - Amphibians, including great crested newts (protected under Conservation of Habitats and Species Regulations 2017 and Wildlife and Countryside Act 1981);
 - Birds listed on Annex 1 of the Birds Directive and on Schedule 1 of the Wildlife and Countryside Act 1981;
 - Birds listed on the red and amber lists of Birds of Conservation Concern (BoCC) / Birds of Conservation Concern in Wales (BoCCW);
 - All breeding birds within the Scoping Report Corridor;
 - Bats (protected under Conservation of Habitats and Species Regulations 2017 and Wildlife and Countryside Act 1981) roosting within trees on the Scoping Report Corridor;
 - Bats utilising habitats within the Scoping Report Corridor for foraging / commuting;
 - Dormice (protected under Conservation of Habitats and Species Regulations 2017 and Wildlife and Countryside Act 1981) utilising habitats within the Scoping Report Corridor;

- Badgers (protected under the Protection of Badgers Act 1992) utilising habitats within the Scoping Report Corridor; and
- Otters (protected under Conservation of Habitats and Species Regulations 2017 and Wildlife and Countryside Act 1981) utilising habitats within or adjacent to the Scoping Report Corridor.

7.4 Scoping of impacts

- 7.4.1 Table 7.1 and Table 7.2 present a summary of the scoping. They identify which likely environmental effects, with respect to ecology will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).
- 7.4.2 Based on the information available at the time of preparing this report, examples of sources of potential effects on ecology and nature conservation receptors during site preparation and construction could include:
- Effects resulting from vegetation clearance to enable construction;
 - Effects resulting from cable undergrounding works;
 - Small areas of permanent land-take for the wood pole structures;
 - Modification of habitats including via effects on local hydrology;
 - Effects resulting from noise, vibration, air emissions (dust), air pollution from vehicles and presence of people associated with construction activities;
 - Effects on the water quality of aquatic habitats, potentially extending beyond the project boundary as a result of run-off during construction;
 - Introduction/ spread of invasive non-native species; and
 - Killing/ injury/ disturbance of species.
- 7.4.3 Overhead lines and buried cables are regarded as long-life assets, therefore very limited on-going remedial work is likely to be required. Examples of sources of potential effects on ecology receptors during operation and maintenance could include:
- Effects resulting from the introduction of new structures in the environment (e.g. wildlife collisions);
 - Effects arising from EMFs; and
- 7.4.4 Effects / disturbance arising from tree clearance / vegetation management along lines. The proposed development is at the scoping stage, therefore surveys will need to account for routing revisions and the fact that construction methodology, associated temporary accesses, laydown areas, compounds etc. have not yet been determined. However, when determining the scope for EIA consideration and required surveys and methodologies, it is important to consider the nature of the proposed development, including potential embedded mitigation. This may include, but not necessarily be limited to the maintenance of buffers from sensitive ecological receptors (e.g. watercourses and notable trees) and ability to micro-site wood pole locations and be flexible regarding laydown and compound locations. Furthermore, Precautionary Working Method Statements (PMWSs) are likely appropriate to mitigate the risk to a number of species. Including these measures will avoid extensive unnecessary surveys being undertaken.
- 7.4.5 Mitigation will consider relevant nature conservation legislation and good practice. Protected species licences will be applied for where required, to enable works that would otherwise be unlawful, in line with licence conditions and method statements.
- 7.4.6 A Construction Environment Management Plan (CEMP) will be developed and adhered to throughout the duration of the construction of the proposed development. The CEMP will set out guidance on compliance with nature conservation legislation, policy and best practice.

TABLE 7.1: POTENTIAL ECOLOGY IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Impact on statutory designated sites of nature conservation importance.	Yes	Potential for effects through pollution and temporary impact (e.g. disturbance through noise and construction lighting).
Impact on non-statutory sites of nature conservation importance.	Yes	Potential for effects through pollution and temporary impact (e.g. disturbance through noise and construction lighting).
Impact on terrestrial habitats within the application site, including those of principal importance and GWDTEs on, or within proximity to the application site.	Yes	Potential for direct and indirect effects through habitat loss, modification, pollution and temporary impact (e.g. disturbance through noise and construction lighting).
Potential impacts on ancient woodland and veteran trees on, or within proximity to the application site.	Yes	Potential for direct and indirect effects through habitat loss, modification, pollution and temporary impact (e.g. disturbance through noise and construction lighting).
Impacts on legally protected species including badgers, bats, dormice, GCN and otters.	Yes	Potential for permanent effects including killing/injury of individuals, habitat loss / severance / pollution and temporary impact (e.g. disturbance through noise and construction lighting).
Impacts on other protected / notable species, including water voles, reptiles and invertebrates.	No	These species will be considered, however due to the embedded mitigation (e.g. maintenance of watercourse buffers) there is limited potential for significant effects.
Impacts on breeding, wintering and passage birds.	Yes	Potential for permanent effects including killing/injury of individuals, habitat loss / severance / pollution and temporary impact (e.g. disturbance through noise and construction lighting).

TABLE 7.2: POTENTIAL ECOLOGY IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Impacts on breeding, wintering and passage birds.	Yes	Potential for the overhead line to pose a collision risk and provide predator perches.
It is considered that the potential for significant impacts to all other ecological receptors outlined in the table above during operation is negligible.	No	For the purpose of the EIA, it is not considered that the operational phase of the proposed development will have a significant effect on further ecological receptors.

7.5 Methodology for impact assessment

- 7.5.1 A summary of the proposed methodology to establish the ecological baseline for relevant receptors within the Scoping Report Corridor is provided below. All surveys will be undertaken in accordance with the most up to date relevant guidelines and only deviate from these when there is robust rationale to do so and the ecologist making the judgement has the relevant expertise.
- 7.5.2 The proposed approach to surveys has been informed by an analysis of data received from Aderyn (Wales' Biodiversity Information & Reporting Database), review of relevant data on DataMapWales, knowledge of the area and a site visit of the Scoping Report Corridor undertaken in January 2024. The Extended Phase 1 habitat survey will further inform on-going surveys. The initial proposed approach is outlined below.

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- 7.5.3 To define the total extent of the study areas for the assessment, the proposed development activities have been reviewed in order to identify the spatial scale at which ecological features could potentially be affected. The zone of influence is the area encompassing all predicted ecological impacts from the proposed development, including those which would occur by land-take and habitat loss, those which may occur through construction disturbance (e.g. noise) and those which may occur during operation of the development (e.g. wildlife collision, provision of raptor perches etc.). The proposed study area for relevant ecological receptors is outlined in Table 7.3.

TABLE 7.3: THE PROPOSED STUDY AREA

Ecological Survey	Study /	Proposed Study Area
Desk study		The Scoping Report Corridor*, plus the following buffers: • 10 km for Special Protection Areas (SPAs), potential SPAs (pSPAs) and Ramsar sites; • 2 km for Special Areas of Conservation (SACs) and candidate SACs (cSACs,) (there are no sites for which bats are a qualifying species within 20 km), nationally important statutory sites of nature conservation importance, such as SSSIs; • 2 km for non-statutory sites of nature conservation importance and protected or notable species; and • 250 m for Ground Water Dependent Terrestrial Ecosystems (GWDTE).
Extended Phase 1 habitat survey and in-depth botanical surveys (NVC) of relevant areas.		The Scoping Report Corridor*.
Hedgerow, bat tree, bat activity, dormice and any other protected / notable species if determined necessary following initial desk and field-based study.		The Scoping Report Corridor*. Where there are features of interest adjacent to the project boundary or features, such as hedgerows, continue beyond this area, these will also be assessed.
GWDTE		The Scoping Report Corridor*, plus 250 m.
Great crested newt		Ponds with the Scoping Report Corridor*, plus 300 m.
Badger		The Scoping Report Corridor*, plus 30 m.
Otter		The Scoping Report Corridor*, plus 100 m (where necessary).
Raptors and waders (activity / potential breeding)		The Scoping Report Corridor*, plus 500-800 m (where desk and field-based study suggests required).
Other birds (breeding)		The Scoping Report Corridor*, potentially beyond for certain species (e.g. those listed under Schedule 1 of the Wildlife and Countryside Act 1981).
* Alternatively, the finalised project boundary if determined		

Desk-based assessment

- 7.5.4 The desk study will provide data to inform field surveys. All standard data sources will be used and further data-holders or local expertise consulted where relevant. All appropriate modelling data will be used to inform survey and assessment (e.g. WOM21 GCN Potential Habitat layer on DataMapWales).

Surveys - Habitats

- 7.5.5 An Extended Phase 1 habitat survey will involve a walkover mapping habitats and evidence of, or potential for protected species (April – September).
- 7.5.6 Any notable habitats (including GWDTEs) will be subject to further in-depth botanical survey (National Vegetation Classification; June – September).

- 7.5.7 Hedgerows will be surveyed following a standard evaluation and grading system³³. Where surveys of hedgerows identified as potentially important under the Hedgerow Regulations 1997 have been undertaken outside of the optimum period further assessment will be undertaken during the appropriate time of year.

Surveys – Species

Bats

- 7.5.8 A daytime bat walkover (DBW) and further surveys as outlined below will be undertaken during 2024. These will provide an understanding of the bat species, roost suitability and bat activity levels within the Scoping Report Corridor. A full suite of all survey types at this stage is considered disproportionate to the value of data they would provide and to the risk to bats from the finalised route. There will be multiple years between the ecology field surveys undertaken as part of the EIA and the commencement of the construction phase. Therefore, considering the dynamic nature of tree roosts and that the majority of trees will be outside of the finalised project zone of influence, it is proposed that further tree roost surveys will be undertaken once potential impacts to specific trees are known. It is worth noting that impacts to other potential roost structures are extremely unlikely as the route is designed to maintain a significant buffer from buildings.
- 7.5.9 An initial desk-based habitat assessment will be undertaken to inform scoring of habitat features based on their potential to comprise an important commuting / foraging resource. The subsequent DBW will further inform and clarify the assigned scores. Linear features that score higher and which are likely to be affected during the construction of the proposed development, will be monitored using full spectrum static acoustic detectors. Static detectors will be deployed for at least five days per month, each month from May until October inclusive. If high levels of activity are recorded at features likely to be impacted as part of the proposed development, targeted vantage point / back-tracking surveys may be undertaken to establish direction and confirm surrounding features of high value.
- 7.5.10 Select ground level tree assessment (GLTA) surveys of trees will be completed to give an idea of roost resource within the Scoping Report Corridor. These will be undertaken in spring when bat features are identifiable due to the lack of foliage on trees. This data, together with general bat activity data (see below) and desk-based assessment will inform the design stage (i.e. aim to avoid sensitive locations). Once the route and construction methods / timescales have been finalised, further in-depth surveys will be carried out on potential roost trees at risk from the proposed development. This may include aerial inspections, emergence surveys with night vision aids (NVAs), motion activated trail cameras and / or advanced licence bat survey techniques (ALBST) where necessary.

Dormice

- 7.5.11 Where habitat is found to be suitable to support a population of dormice, further habitat assessment will be undertaken using a proforma based assessment. Where required, nest tubes and / or boxes will be installed and checked once per month during May and July to October inclusive. Nut searches will also be undertaken to inform presence / absence of the species.

Great Crested Newt

- 7.5.12 Ponds within the Scoping Report Corridor and approximately 300 m buffer will be subject to Habitat Suitability Index (HSI) survey. Environmental DNA (eDNA) analysis of pond water will be carried out where determined necessary (e.g. within 250 m, or less if there are significant barriers to amphibian dispersal). eDNA surveys will be undertaken between mid-April and mid-June. The need for further population size surveys will be assessed using GCN presence / absence data, surveys of terrestrial habitat and up to date proposals. A proportionate consideration will be given to the inclusion of ponds with negative eDNA that are in close proximity to ponds with confirmed GCN presence. Taking into account the nature of the scheme and embedded mitigation (e.g. it is extremely unlikely that any works will take place within 50 m of any ponds or impact good quality terrestrial habitat within 100 m of any ponds), it is considered that presence / absence data will likely be sufficient to inform any mitigation / licensing requirements.

³³ HEGS, Clements and Toft. (1993). Hedgerow Evaluation and Grading System.

Badgers

- 7.5.13 The status and activity of any sett recorded during the Extended Phase 1 habitat survey will be determined in accordance with the standard published descriptions and criteria. If required, setts will be subject to further monitoring.

Otter

- 7.5.14 Otter surveys will be undertaken on watercourses that have the potential to be utilised for holts and where there is a risk of disturbance impacts.

Birds

- 7.5.15 Vantage point (VP) surveys will be undertaken at locations with suitable breeding habitat to determine breeding and / or general activity levels / flight paths of raptors and waders. Eight VP locations have been identified based on known peregrine / goshawk breeding sites, presence of woodland blocks with mature trees (suitable for goshawk and other raptors) and known or suitable curlew and other wader breeding locations. At least 36 hours of surveillance will be carried out at each VP (approximately 2 days per month) between March – June/July.
- 7.5.16 Three walked breeding bird survey (BBS) transects (approx. 4-5 km) will be undertaken to cover areas with higher quality habitats for breeding passerines and waders (e.g. ancient woodland and large hedgerows) as well as a representative variety of habitats including hedgerows, woodlands (coniferous and deciduous), farmland and moorland. Moorland areas will be surveyed in line with Brown & Shepherd methodology. Each of the three transects will be subject to an early morning survey four times between early April and June.
- 7.5.17 Data will be analysed as the surveys progress and methods and survey locations will be adapted where necessary.

Impact assessment

- 7.5.18 The impact assessment will follow the Guidelines for Ecological Impact Assessment (EclA) in the UK and Ireland (CIEEM, 2018, updated 2022). The assessment will take into account all legal considerations and relevant national and local planning policies and will be in line with the British Standard BS42020:2013 'Biodiversity – Code of practice for planning and development'.
- 7.5.19 The approach to assessment will take account of existing guidance and published scientific literature in relation to ecology and powerline interactions, alongside professional judgement and experience of similar projects.
- 7.5.20 The project will adhere to the EclA key principles (e.g. avoid>mitigate>compensate) and the Welsh Government's Net Biodiversity Benefit (NBB) approach. The five attributes of ecosystem resilience (diversity, extent, condition and connectivity and adaptability (DECCA)) will be considered during the assessment and development of any mitigation / compensation measures required. Assessment and recommendations will consider Natural Resources Wales data regarding ecosystem resilience, for example Priority Habitat Networks (PENs).

Habitats Regulations Assessment

- 7.5.21 The ecological impact assessment will include sufficient information for the Welsh Ministers as the competent authority to undertake (if required) an appropriate assessment of likely significant effects of the proposed development on Natura 2000 designated sites and associated functionally linked land.

Consultation

- 7.5.22 The approach detailed above has been informed by initial feedback received from NRW's Senior Species Advisor and Specialist Advisor for Bats. In relation to bats, NRW's advice corroborated up-to-date evidence in relation to the often limited value of transect-type surveys. The Specialist Advisor indicated that transect-type surveys are only advised if there is specific reason to do so, not as standard as previous guidance has recommended.
- 7.5.23 NRW noted that woodland crosses the Scoping Report Corridor at a number of locations and that all alternatives to sensitive habitat loss must be considered prior to finalising project design. If there is no

alternative to loss or direct impact to habitats such as semi-natural woodland, these will require an appropriate level of elevated survey effort to assess potential impacts.

- 7.5.24 Further consultation will be undertaken through the scoping phase and with relevant statutory bodies and other organisations where appropriate.

8 Landscape and Visual Impact

8.1 Introduction

- 8.1.1 This chapter of the Scoping Report considers the potential landscape and visual effects that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the EIA for the project.
- 8.1.2 The Landscape and Visual Impact Assessment (LVIA) scoping chapter takes into account the current stage of the routing process to determine the study area for the assessment of potential landscape and visual effects. It outlines the proposed scope for the final ES that will be submitted as part of the DNS application.
- 8.1.3 The objective of preparing this LVIA scoping assessment is to consider:
- The likely impact on landscape character and value (this involves considering likely changes to landscape elements, aesthetic or perceptual qualities, and defining characteristics); and
 - The likely effects on the views and overall visual experience of visual receptors which may change due to the proposed development's influence on the landscape's appearance.
- 8.1.4 This scoping chapter sets out the proposed scope and methodology of the LVIA assessments that will be conducted to ensure that the development of the proposed development minimises adverse effects as far as possible. It will provide a framework for the comprehensive assessment of the proposed development and will facilitate the identification of key factors that require detailed study.
- 8.1.5 The following information sources will be used to inform the LVIA:
- Natural Resources Wales (NRW) National Landscape Character Areas (NLCAs);
 - Powys County Council (2022) Landscape Character Assessment;
 - NRW's LANDMAP maps and surveys (and associated guidance notes);
 - Ordnance Survey (OS) Maps;
 - Aerial photography, Google Earth and Google Maps Street View;
 - Powys Local Development Plan (2011-2026); and
 - National and local landscape designations and associated designation statements/management plans

8.2 Study area

- 8.2.1 The study area for the LVIA is a crucial component in understanding the potential impacts of the proposed development.
- 8.2.2 During the routing stage, a detailed analysis of existing information, including Ordnance Survey maps, Local Development Plans, LANDMAP, and national and local landscape assessments, was undertaken alongside consideration of the Holford rules. This led to the selection of a preferred corridor, chosen based on professional expertise and the potential impact of overhead line infrastructure on the landscape character and visual amenity. Further detail on the Holford Rules and the routing study can be found in Appendix A.
- 8.2.3 For the purposes of this Scoping Report, a wider 1km buffer is considered around the Scoping Report Corridor to form the initial study area, illustrated in Figure 8.1. This is to evaluate the potential visual impacts that the proposed approximately 15-metre-high OHL may have on the surrounding landscape and visual receptors. Once the final route alignment is established, the study area would be narrowed down.

- 8.2.4 Visual impacts at more distant locations and viewpoints are considered, particularly in areas of landscape importance or where the topography affords expansive views of the proposed development. Based on this, 18 viewpoints are selected which are discussed further in section 8.4 and Table 8.5 of this chapter. These viewpoint locations are determined through desk-based studies, field surveys and professional judgement and will be further refined through consultations with stakeholders.

Existing Condition

- 8.2.5 The Scoping Report Corridor passes through a landscape rich in natural and cultural elements. From south to north, commencing at the proposed Rhiwlas Energy Park and extending to Trefeglwys, the initial segment of the corridor lies east of Llanidloes, covering a varied topography. This section is distinguished by the steep wooded terrain ascending from the River Severn floodplain toward the vicinity of Llyn Ebyr. The remaining segment of the corridor to the north spans from Trefeglwys to the Collector Substation at Llyn Lort, positioned east of Carno. Here, the corridor passes through a terrain that poses greater challenges due to its steeper slopes. The corridor thus represents a range of environmental conditions, each with its distinct set of considerations for the scoping process.

8.3 Landscape Baseline

- 8.3.1 The study area extends across diverse Landscape Character Areas (LCAs), which have been identified at both national and regional scales:
- Based on NRW's National Landscape Character Assessment of Wales, the study area includes the following National Landscape Character Areas (shown on Figure 8.2) Montgomeryshire Hills and Vales NLCA 17;
 - Severn Valley NLCA 19;
 - Radnorshire Hills NLCA 20;
 - Cambrian Mountains NLCA 21; and
 - Upper Wye Valley NLCA 26
- 8.3.2 The Powys County Council Landscape Character Assessment provides a more detailed classification of the landscape within the Study Area (shown on Figure 8.3). This classification identifies the unique attributes of the local landscape, contributing to a better understanding of the area's landscape context. The Powys County Council landscape character assessment will be adopted as the principal spatial framework for the assessment of the landscape and visual effects of the proposed development:
- Esgair Cwmowen LCA 17;
 - Carno Valley LCA 19;
 - Trannon LCA 20;
 - Llyn Clywedog LCA 23;
 - Caersws Valleys LCA 25;
 - Llawr-y-glyn Hillsides LCA 26;
 - Upper Wye and Severn Valleys LCA 30;
 - Bwlch-y-sarnau Uplands LCA 31; and
 - Drysgol Uplands LCA 37
- 8.3.3 LANDMAP is an online resource tool for establishing the baseline landscape conditions within the provisional Study Area. As a comprehensive GIS-based resource covering Wales, LANDMAP records and evaluates landscape characteristics, qualities, and influences. It comprises five themed datasets, known as 'aspects', including the following:

- Geological Landscape;
- Landscape Habitat;
- Visual and Sensory;
- Historic Landscape; and
- Cultural Landscape.

- 8.3.4 Each aspect area includes an 'overall evaluation' rating, which ranges from 'low' (indicating little or no importance) to 'outstanding' (signifying national importance). The evaluations for the Scoping Corridor can be found in Figure 8.4.
- 8.3.5 The local landscape character assessment incorporates guidance from the Landscape Institute, Natural England, and NatureScot, as referenced by NRW.
- 8.3.6 The combined data from national and local landscape character assessments alongside LANDMAP offers a comprehensive overview of the landscape character of the study area. However, due to the varying scales and sources of these resources, a more detailed local landscape character assessment will be carried out specifically for the LVIA.

Nationally designated landscape

- 8.3.7 The Scoping Report Corridor does not pass through any nationally designated landscape.

Locally designated landscapes

- 8.3.8 The Scoping Report Corridor does not pass through any locally designated landscape.

8.4 Visual Baseline

- 8.4.1 The study area encompasses a significant number of visual receptors that are sensitive to changes in the landscape (shown on Figure 8.5). These receptors include:
- Settlements: Individuals living within settlements including Llanidloes Clatter, and Trefeglwys which are adjacent to the Scoping Report Corridor.
 - Standalone residences: Includes scattered residences, holiday lets etc.
 - Outdoor recreation: This group includes individuals using National Trails (Glyndwr's Way), Long distance footpath (Severn Way), Public Rights of Way (PRoW), National Cycle Network (NCN Route 81) routes, hill summits, and promoted viewpoints.
 - Visitors: People staying at campsites, caravan parks, and other holiday accommodations within the area.
 - Trails and Footpaths: All nationally and locally recognized trails and county walks within 1km of the final preferred alignment will be individually assessed. A general assessment of the impact on footpath users will be conducted, with a sample of key routes within each landscape character area evaluated.
 - Travelers: Those traveling along the road and rail network, with a focus on key routes such as the A470 and Cambrian Way that intersect the scoping corridor.
- 8.4.2 Through a combination of desktop and site assessment, provisional representative viewpoints have been identified along and adjacent to the identified Scoping Report Corridor. It is proposed that these viewpoints will be used to assess the visual effects of the final alignment of the proposed development. Consultations will be undertaken to agree the assessment viewpoints and positions are likely to require micro-siting or revision once the final alignment of the proposed development has been determined.

TABLE 8.1: PRELIMINARY PROPOSED REPRESENTATIVE VIEWPOINTS

VP No	Viewpoint Title	Coordinate reference	Powys County LCA	Reason for selection
1	South of Llyn Lort Energy Park PRow	52.6042°N 3.4678°W	LCA 17: Esgair Cwmowen	Viewpoint representative of users of the local public right of way network in particular PRow 236/28/2, 236/28/1 and 236/2/1 and users of the local rural road network.
2	North of Y Capel Stone Circle Scheduled Monument	52.5976°N 3.4755°W	LCA 17: Esgair Cwmowen	Viewpoint representative of visitors to the Scheduled Monument, users of Prow 236/77/2.
3	Maesypandy	52.5523°N 3.4879°W	LCA 19: Carno Valley	Viewpoint representative of residential properties in the vicinity of Maesypandy and users of the local rural road network.
4	Allt y Genlli forest trail	52.5413°N 3.4935°W	LCA 20: Trannon	Viewpoint representative of recreational users of Allt y Genli forest trail.
5	Clos Hen Dy Southwest of Clatter	52.5404°N 3.48079°W	LCA 19: Carno Valley	Viewpoint representative of residential properties in Clatter, users of PRow 244/40/1 and road users of Clos Hen Dy.
6	Colwyn Bridge, north of B4569	52.5174°N 3.4976°W	LCA 26: Llawr-y-glyn Hillside	Viewpoint representative of users of the local rural road network.
7	Meadow Springs Country and Leisure Park Caravan Site	52.5986°N 3.5045°W	LCA 25: Caersws Valleys	Viewpoint representative of visitors to the caravan park.
8	B4569 South of Trefeglwys	52.5004°N 3.5208°W	LCA 25: Caersws Valleys	Viewpoint representative of residential properties at Maes Trannon to the south of Trefeglwys and road users of the B4569.
9	B4569 Cerist	52.4813°N 3.5276°W	LCA 26: Llawr-y-glyn Hillside	Viewpoint representative of residential properties at Cerist and road users of the B4569.
10	National cycle network -Route 81	52.4691°N 3.5058°W	LCA 26: Llawr-y-glyn Hillside	Viewpoint representative of users of the National Cycle Network Route 81, the Severn Way Long Distance Path and users of the local road network.
11	North of Wigdwr Farm	52.4680°N 3.4859°W	LCA 26: Llawr-y-glyn Hillside	Viewpoint representative of users of the local rural road network.
12	South of Leylands Caravan Park	52.4529°N 3.4891°W	LCA 31: Bwlch-y-sarnau Uplands	Viewpoint representative of recreational users of the caravan park, residential properties in the vicinity of Rallt, and users of the local road network.
13	Glydwr's Way	52.4411°N 3.4983°W	LCA 31: Bwlch-y-sarnau Uplands	Viewpoint representative of the residential receptor northwest of Woodland View Caravan Park, users of the Glydwr's Way long distance footpath, and users of the local road network.

VP No	Viewpoint Title	Coordinate reference	Powys County LCA	Reason for selection
14	PRoW 220/135/1	52.4207°N 3.5009°W	LCA 31: Bwlch-y-sarnau Uplands	Viewpoint representative of users of the PRoW 220/135/1.
15	A470, south of Llanidloes	52.4373°N 3.5435°W	VP 30: Upper Wye and Severn Valleys	Viewpoint representative of users of the local road network in the town of Llanidloes.
16	Cefn-yr-Hafodau PRoW 231/22/2	52.4210°N 3.5461°W	VP 30: Upper Wye and Severn Valleys	Viewpoint representative of residents at Cefn-yr-hafodau farm and users of PRoW 231/22/2.
17	Bryn Mawr PRoW 231/118/3	52.4106°N 3.5457°W	VP 37: Drysgol Uplands	Viewpoint representative of users of PRoW 231/118/3.
18	Cae Celyn, north of Rhiwlas Energy Park PRoW 231/40/1	52.4058°N 3.5657°W	VP 37: Drysgol Uplands	Viewpoint representative of users of PRoW 231/40/1 and users of the local road network.

8.5 Future Baseline

- 8.5.1 The LVIA will account for the cumulative impacts that the proposed development would have when combined with other planned developments in the vicinity.
- 8.5.2 Projects will be incorporated into the cumulative baseline analysis if there is a likelihood of significant cumulative effects and if adequate information exists to inform the assessment. Additionally, the context of climate change and potential environmental changes are considered.

8.6 Scoping of Impacts

- 8.6.1 Table 8.2 and Table 8.3 present a summary of the scoping. They identify which likely environmental effects, with respect to landscape will be assessed in the EIA (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 8.2: POTENTIAL LANDSCAPE AND VISUAL IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Landscape	Yes	Potential significant effects
Visual	Yes	Potential significant effects

TABLE 8.3: POTENTIAL LANDSCAPE AND VISUAL IMPACTS – OPERATION

Potential Impact	To be assessed in EIA	Reason
Landscape	Yes	Potential significant effects
Visual	Yes	Potential significant effects

8.6.2 With regard to the above, and for the sake of clarity, it is confirmed that the potential effects on landscape and visual amenity should be scoped into the forthcoming EIA at both the construction and operational phases.

8.7 Methodology for Impact Assessment

Guidance and Best Practice

8.7.1 The LVIA would be undertaken in a systematic fashion based on the following guidance:

- Landscape Institute and the Institute of Environmental Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition ('GLVIA3');
- Landscape Institute (2019) Advice Note 01/11 Photography and photomontage in landscape and visual impact assessment;
- Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals;
- Landscape Institute (2019) Residential Visual Amenity Assessment (RVAA) Technical Guidance Note 2/19;
- NatureScot (2021) Assessing the cumulative impact of onshore wind energy developments;
- Natural Resources Wales (undated) Using LANDMAP in Landscape and Visual Impact Assessments GN46;
- Scottish Natural Heritage (2017) Visual Representation of Wind Farms, Version 2.2; and
- The Holford Rules: Guidelines for the Routeing of New High Voltage Overhead Transmission Lines (with National Grid Company plc (NGC) 1992 and Scottish Hydro-Electric Transmission plc (SHETL) 2003 Notes).

Data Collection

Data collection – Desk based

8.7.2 The information sources listed above will be the basis for desk-based data collection to support the LVIA.

Data collection – Field survey

- 8.7.3 Field survey will be conducted to evaluate the project site and its surroundings. The timing of these site visits will be determined in consultation stakeholders, including taking account of any responses as part of the EIA scoping process. The site surveys will be conducted from viewpoints that represent different receptor types and distances from the proposed development. These viewpoints will be agreed in collaboration with Powys County Council. This will involve capturing viewpoint photography that aids in generating wireframes and photomontages.

Visualisation

- 8.7.4 Wireframes and verified photomontages will be used to consider and illustrate changes to views during operation of the proposed development. We propose to produce Landscape Institute (LI) Type 4 verified photomontages and wireframes (as defined in LI Technical Guidance Note 'Visual Representation of Development Proposals').
- 8.7.5 The purpose of verified photomontages is to present an accurate representation of the proposed development which enables its potential visual effects to be evaluated, assessed, and reported in the Environmental Statement.
- 8.7.6 The methodology to be used for the production of wireframes and photomontages is based on current best practice and follows recommendations from:
- Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals;
 - Landscape Institute IEMA Guidelines for Landscape and Visual Impact Assessment - 3rd edition (GLVIA3); and
 - Scottish Natural Heritage (Nature Scot) – Visual Representation of Windfarms Version 2, 2014
- 8.7.7 Viewpoint photography will be undertaken in one season, likely winter.

Assessment of the effects

- 8.7.8 The LVIA follows the Guidelines for Landscape and Visual Impact Assessment (GLVIA3). It separately evaluates the effects on landscape and visual amenity.
- 8.7.9 The LVIA will assess:
- The impact on the landscape itself, including changes to its elements, aesthetic qualities, and character. The landscape's sensitivity is gauged by the value attributed to it and its susceptibility to the proposed changes.
 - The impact on views and visual experiences of people, based on alterations to the landscape's visual arrangement. The sensitivity of visual receptors is determined by the effect of the development on the observer's experience.
 - Assessing the significance of landscape and visual effects involves evaluating the sensitivity of receptors—based on their susceptibility to change and value—and the magnitude of impact, considering size, scale, geographic extent, duration, and reversibility. Sensitivity is recorded as high, medium, or low, while magnitude of impact is classified as high, medium, low, or negligible.
 - These judgements of sensitivity and magnitude are integrated to determine the overall significance of the effect. Landscape or visual effects are categorized as major, moderate, minor, or negligible, with 'moderate' and 'major' effects regarded as significant under EIA Regulations. Effects are also described as positive (beneficial), neutral, or negative (adverse).

9 Cultural Heritage and Archaeology

9.1 Introduction

- 9.1.1 This chapter of the Scoping Report identifies potential impacts with regard to cultural heritage that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.

Legislation, Policy and Guidance

- 9.1.2 The assessment will be carried out with due regard to the following:

- The Ancient Monuments and Archaeological Areas Act 1979 (1979 Act)³⁴
- Historic Environment (Wales) Act 2016³⁵
- Planning (Listed buildings and Conservation Areas) Act 1990³⁶
- Future Wales: The National Plan 2040 (February 2021)³⁷
- Planning Policy Wales (Edition 12, February 2024)³⁸
- Technical Advice Note (TAN) 24: The Historic Environment, 2017³⁹
- Local Development Plans⁴⁰
- Cadw 'Conservation Principles for the sustainable management of the Historic Environment in Wales' (2011)⁴¹
- Cadw Setting of Historic Assets in Wales (2017)⁴²
- Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs)⁴³
- Guidelines for digital archives⁴⁴
- Standard and Guidance for Desk-Based Assessment⁴⁵

9.2 Baseline

- 9.2.1 The area that surrounds the Scoping Report Corridor is largely a landscape of pasture and woodland with scatterings of isolated settlements, usually agricultural in nature. Within the vicinity of the Scoping Report Corridor there are heritage assets dating from the prehistoric, including several designated assets, through to post-medieval agricultural and industrial assets. This area was one of the most productive

³⁴ Ancient Monuments and Archaeological Areas Act 1979. Available at: <https://www.legislation.gov.uk/ukpga/1979/46/contents>

³⁵ Historic Environment (Wales) Act 2016. Available at: <https://www.legislation.gov.uk/anaw/2016/4/contents>

³⁶ Planning (Listed Buildings and Conservation Areas) Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/9/contents>

³⁷ Welsh Government. (2021). Future Wales: The National Plan 2040. Available at: <https://www.gov.wales/future-wales-national-plan-2040>

³⁸ Welsh Government. (2024). Planning Policy Wales. Available at: <https://www.gov.wales/planning-policy-wales>

³⁹ Welsh Government. (2017). Planning Policy Wales. Technical Advice Note (TAN) 24: The Historic Environment, May 2017. Available at: <https://www.gov.wales/technical-advice-note-tan-24-historic-environment>

⁴⁰ Powys County Council. (2018). Powys Local Development Plan. Available at: <https://en.powys.gov.uk/article/4898/Adopted-LDP-2011---2026#:~:text=The%20Powys%20Local%20Development%20Plan,the%20Brecon%20Beacons%20National%20Park>

⁴¹ Cadw. (2011). Conservation Principles for the sustainable management of the Historic Environment in Wales' Cardiff: Cadw. Available at: <https://www.thenbs.com/publicationindex/documents/details?Pub=WAG&DocId=298923>

⁴² Cadw. (2017). Setting of Historic Assets in Wales. Cardiff: Cadw. Available at: <https://cadw.gov.wales/sites/default/files/2019-05/Setting%20of%20Historic%20Assets%20in%20Wales%20EN.pdf>

⁴³ The Welsh Archaeological Trusts. (2022). Guidance for the Submission of Data to the Welsh Historic Environment Records (HERs). Available at:

⁴⁴ RCAHMS. (2021). RCAHMS Guidelines for Digital Archives. Available at: <https://rcahms.gov.uk/wp-content/uploads/2016/09/RCAHMS-Guidelines-for-Digital-Archives.pdf>

⁴⁵ Chartered Institute for Archaeologists. 2020. Standard and guidance for historic environment desk-based assessment. Reading

parts of Europe for lead mining in the 19th century but was also known previously for its silver mines and latterly for its textile production. A search of all of the non-designated sites within a study area surrounding the Scoping Report Corridor will be undertaken as a part of the Desk-based assessment, the size of which will be agreed in advance with the Clwyd-Powys Archaeological Trust Development Control (CPAT-DC) as archaeological advisors to PCC.

- 9.2.2 The Scoping Report Corridor skirts the eastern boundary of the Clywedog Valley (HLW (P) 6) and lies less than 1 km to the west of Caersws Basin (HLW (P) 5), both Registered Historic Landscape of Special Historic Interest which are noted as containing evidence of human activity from the late prehistoric to the recent past.
- 9.2.3 The Scoping Report Corridor does not lie within any Conservation Areas or Registered Parks and Gardens.
- 9.2.4 A 3km study area has been applied surrounding the Scoping Report Corridor following the advice within Schedule 4 of The Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016⁴⁶. Within the 3 km study area there are four Conservation Areas, Cwm Elan, Llangurig, Llanidloes and Llanwnnog.
- 9.2.5 Within the 3 km study area there are 26 Scheduled Monuments. The majority of these (20 sites) relate to prehistoric assets. Within the bounds of the Scoping Report Corridor there are three Scheduled Monuments. These are Y Capel Stone Circle (MG179), Nant Cwm Gerwyn Cairns (MG278) and Domen Glw Cairn (MG267), all likely Bronze Age date.
- 9.2.6 Within a 3 km study area there are 269 Listed Buildings, these comprise one Grade I, eleven Grade II* and the remaining 257 are Grade II. Four of these lie within the Scoping Report Corridor, one Grade II* and three Grade II (Figure 1).

9.3 Receptors

- 9.3.1 The key potential receptors which lie within the Scoping Report Corridor have been identified as follows:
- HLW (P) 6 – Clywedog Valley Registered Historic Landscape
 - MG179 – Y Capel Stone Circle
 - MG278 – Nant Cwm Gerwyn Cairns
 - MG267 – Domen Glw Cairn
 - Grade II* Listed Building 7584 Ystradfaelog
 - Grade II Listed Building 17781 Milestone W of Maesyderwyn Lane
 - Grade II Listed Building 83240 Chapel House and Sunday School
 - Grade II Listed Building 83246 Pwllpridd
- 9.3.2 Further non-designated receptors are likely to be identified during the desk-based assessment.

9.4 Scoping of Impacts

- 9.4.1 Table 9.1 and Table 9.2 present a summary of the scoping. They identify which likely environmental impacts, with respect to Cultural Heritage will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 9.1: POTENTIAL CULTURAL HERITAGE IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
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⁴⁶ Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. Available at: <https://www.legislation.gov.uk/wsi/2016/59/schedules/made>

Destruction or damage of known heritage assets designated and non-designated	Yes	Groundworks relating to the construction works have the potential to directly impact the heritage assets. With sensitive routing of the alignment and/or appropriate mitigation the effect can be reduced or avoided.
Destruction or damage of previously unknown heritage assets	Yes	Groundworks relating to the construction works have the potential to directly impact the heritage assets, appropriate mitigation can be put in place to reduce the impact on the heritage resource.

TABLE 9.2: POTENTIAL CULTURAL HERITAGE IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Impact to the setting of designated assets	Yes	The impact of the proposals must be assessed to be within reasonably acceptable limits, or the impacts mitigated.

- 9.4.2 A Cultural Heritage assessment will be undertaken by Archaeology Wales and will be included as a chapter within the ES. The impact of the proposed connection works on the setting of the designated assets will need to be assessed. This will include the Scheduled Monuments, Listed Buildings and potentially the Conservation Areas and Registered Landscape.
- 9.4.3 Initial consultation with Cadw has been carried out and in their response have detailed their requirement for a Stage 1 assessment of the settings of a number of designated historic assets as set out in Setting of Historic Assets in Wales (Cadw 2017). The Stage 1 assessment will determine the requirements for Stages 2 to 4 to be carried on specific assets. Further consultation will be undertaken with Cadw to determine the assets to be included in assessment.
- 9.4.4 Cadw have clarified that an ASIDOH2 will not be required in relation to the Registered historic Landscapes however these are to be considered within the Setting Assessment.
- 9.4.5 The impacts, both direct and indirect, will need to be assessed for the non-designated assets following a search of the Regional Historic Environment Records (HER) and National Monument Records (NMR) and mitigation recommended where necessary.
- 9.4.6 A site visit will be carried out to assess the potential direct impact on hitherto unknown heritage assets where groundworks will be required. A site visit will also be required to assess the indirect impact on the known non-designated assets within the vicinity of the Scoping Report Corridor (which will be further refined through the iterative EIA process).

9.5 Methodology for Impact Assessment

- 9.5.1 A review of designated heritage assets was undertaken during the routing process which identified key heritage constraints and the most sensitive receptors to be factored in when identifying the initial route corridors. This was taken into consideration when the Scoping Report Corridor was identified (during the routing stage, referred to as the 'preferred corridor' within the Routing Consultation Document (Appendix A)) in seeking to minimise potential effects on the most sensitive receptors.

Desk-based Assessment

- 9.5.3 The first stage in assessing the impact of the proposals is to carry out a Desk-based Assessment (DBA) which will provide the scheme with a more detailed baseline. This will help inform future decision making, design solutions and potential mitigation strategies. The aim is to make full and effective use of existing information in establishing the heritage/archaeological significance of the site encompassed by the Scoping Report Corridor and surrounding areas to elucidate the presence or absence of heritage/archaeological material, its character, distribution, extent, condition and relative significance.

- 9.5.4 The work will include a comprehensive assessment of regional context within which the heritage/archaeological evidence resides and aims to highlight any relevant research issues within the Research Framework for the Archaeology of Wales⁴⁷.
- 9.5.5 The Research Framework for Wales sets out the knowledge base of past research and sets out a rationale for future studies. Some of the key areas relevant to the proposed development include burial and ceremonial sites in relation to the Bronze Age and Post-medieval woollen industry sites within the Scoping Report Corridor.
- 9.5.6 The DBA will provide information of sufficient detail to allow informed planning decisions to be made which can safeguard and /or seek to minimise harm to the heritage/archaeological resource. Preservation in situ is advocated where at all possible, but where engineering or other factors could result in the loss of archaeological deposits, preservation by record is recommended.
- 9.5.7 The DBA will consider the following:
- a) The nature, extent, and degree of survival of heritage/archaeological sites, structures, deposits and landscapes within the study area through assessment of various readily available primary sources:
 - Collation and assessment of all relevant information held in the regional HER at the Clwyd-Powys Archaeological Trust within an agreed study area around the proposed development.
 - Collation and assessment of the impact on all designated heritage/archaeological sites (Scheduled Monuments, Listed Buildings, Historic Parks & Gardens, Landscapes and Conservation Areas) within a 3 km study area around the proposed development area.
 - Assessment of all available excavation reports and archives including unpublished and unprocessed material affecting the site encompassed by the Scoping Report Corridor and its setting.
 - Assessment of aerial photographic (AP) and satellite imagery evidence.
 - Assessment of archive records held at the County Archive in the National Library of Wales (NLW) and the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW).
 - Records held by the developer e.g., bore-hole logs, geological/geomorphological information, aerial photographs, maps, plans and ZTV data.
 - Map regression analysis using all relevant cartographic sources e.g., all editions of the Ordnance Survey County Series, Tithe, and early estate maps (as available).
 - Place-name evidence.
 - Historic documents (e.g., charters, registers and estate papers).
 - b) The significance of any remains in their context both regionally and nationally and in light of the findings of the desk-based study.
 - c) The history of the site.
 - d) The potential impact of any proposed development on the setting of known sites of heritage/archaeological importance.
 - e) The potential for further heritage/archaeological remains to be present, which have not been identified in pre-existing archaeological records.
 - f) The potential for further work, with recommendations where appropriate for a suitable investigative and/or mitigation methodology.

⁴⁷ Research Framework for the Archaeology of Wales, 2017, <https://archaeoleg.org.uk/>

- 9.5.8 A site visit will be carried out as a part of the desk-based assessment. This will be a visual walked search of the accessible development area where groundworks are proposed. The ground surface will be visually inspected for all earthworks, structures and finds. The location of any environmental archaeological deposits, or areas which may have a potential for such deposits, will also be taken into account along with the visible archaeology.
- 9.5.9 The site visit will also assess the visual impact of the proposed development on the setting of known sites of archaeological importance. Photographs will be taken from within the Scoping Report Corridor to help illustrate and assess this visual impact. Designated sites within the study area will also be visited with photographs taken towards the proposed development Scoping Report Corridor to help illustrate and assess this visual impact on these sites.
- 9.5.10 In assessing the value of heritage/archaeological assets, and the potential impacts upon them by the proposed development, the terms and guidance used in the Design Manual for Roads and Bridges, Volume 11, Section 3 (Highways England 2007) will be utilised. Values are given as detailed in Table 9.3:

TABLE 9.3: ASSET VALUE CRITERIA

Value	Description
Very High	Assets of international importance
High	Assets of national importance. Assets that contribute to regional research objectives.
Medium	Assets of regional importance. Assets that contribute to regional research objectives. Assets with lower levels of preservation
Low	Assets of local importance. Includes locally listed buildings and assets of limited value or poor preservation
Negligible	Assets with little surviving archaeological, architectural, or historic interest.
Unknown	The importance of the resource has not been ascertained

- 9.5.11 The magnitude of the potential impact on the heritage/archaeological assets (which can be either positive or negative) is given as detailed in Table 9.4:

TABLE 9.4: MAGNITUDE OF IMPACT CRITERIA

Magnitude	Description
Major	Change to most or all key heritage/archaeological materials, such that the resource is totally altered; comprehensive changes to setting
Moderate	Changes to many key heritage/archaeological materials, such that the resource is clearly modified; considerable changes to setting that affect the character of the asset
Minor	Changes to key heritage/archaeological materials, such that the asset is slightly altered; slight changes to setting
Negligible	Very minor changes to heritage/archaeological materials, or setting
None	No loss or alteration. Change not distinguishable or does not result in loss of heritage significance

Assessment of Significance

- 9.5.12 The significance of effect is determined by the interaction between the sensitivity of the receptor or resource and the magnitude of the impact. Table 9.5 is a matrix that will be used during the assessment stage. A significance of effect of only moderate, moderate/large, large/very large or very large effects are considered 'significant' in the context of the EIA Regulations.

- 9.5.13 Where likely significant adverse effects are identified, mitigation measures to prevent or reduce them will be proposed, and the likely residual effects remaining after mitigation will be ascertained.

TABLE 9.5: SIGNIFICANCE MATRIX

Environmental Value (Sensitivity)	Magnitude of Impact (degree of change)					
		No change	Negligible	Minor	Moderate	Major
	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

Mitigation

- 9.5.14 In the event that ground works cannot be avoided in the location of known surviving assets, a programme of archaeological mitigation will be required. This could take the form of Strip, Map, Excavate (SME) or Archaeological Monitoring and Recording (AM&R) determine the extent of the archaeological remains and preserve by record any assets that will be impacted.
- 9.5.15 Where the proposed development may have indirect impacts on heritage assets mitigation can be utilised to reduce the effects such as the use of natural topography and screening,

Consultation

- 9.5.16 As a part of the assessment the consultations detailed in Table 9.6 will be undertaken.

TABLE 9.6: CONSULTATIONS

Consultee	Reason
Clwyd-Powys Archaeological Trust – Development Control (CPAT-DC)	To obtain approval for a Written Scheme of Investigation (WSI) for the DBA to ensure quality and scope
Clwyd-Powys Archaeological Trust (CPAT) -HER	To obtain baseline heritage data within the study area from the regional Historic Environment Record.
Royal Commission of the Ancient and Historical Monuments of Wales (RCAHMW)	To obtain baseline heritage data within the study area from the National Monument Record
Cadw	To be consulted regarding the designated assets within the study area including the Registered Historic Landscapes and Scheduled Monuments Initial consultation with Cadw has been carried out regarding the designated assets and they have provided feedback on their expectation for the ES Reporting which includes an assessment on the setting of specific assets.

10 Land Quality

10.1 Introduction

- 10.1.1 This section of the Scoping Report identifies potential impacts with regard to Land Quality that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.
- 10.1.2 A scoping assessment has been undertaken which assesses effects on both human health and environmentally sensitive receptors from the presence of contaminated land (soil and groundwater) including ground gases and vapours, with the aim of ensuring that suitable and safe conditions are achieved for the proposed development. Consideration will be given to the information currently available and any necessary to further develop the outline site conceptual models including geology, hydrology, hydrogeology and the geo-environmental conditions (including issues associated with soil gases, chemicals within soils and groundwater). Further details of the hydrology and hydrogeology are presented in Chapter 13 Flood risk, hydrogeology and hydrology. A range of possible impacts associated with the design, construction and operation of the proposed development will be considered.

Legislation and Policy

- 10.1.3 The key guidance, standards and best practice documents have been considered in the Land Quality chapter:
- Environmental Protection Act 1990 (as amended by the Environment Act 1995);
 - Contaminated Land Risk Assessment – A Guide to Good Practice C552 (CIRIA, 2001);
 - Land contamination: risk management (Environment Agency, October 2020);
 - The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017;
 - BS 10175 Investigation of potentially contaminated sites. Code of practice;
 - Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, (Department for Environment, Food and Rural Affairs (Defra), 2009); and
 - A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, February 2022).

10.2 Baseline

- 10.2.1 This section summarises our current understanding of the baseline conditions at the site encompassed by the Scoping Report Corridor. Data has been drawn from available published sources and from other technical reports prepared in relation to the proposed development or parts thereof.
- 10.2.2 Information on material assets and waste, including those that might be potential sources of land contamination, is addressed in Chapter 12 Material Assets and Waste. If present, these land uses and potential contamination sources may require management, treatment and disposal during construction.
- 10.2.3 The following key data sources have been utilised:
- Historical mapping;
 - British Geological Survey (BGS) mapping;
 - MAGIC Environmental database; and
 - Publicly available records.

Site Setting

- 10.2.4 The Scoping Report Corridor is located in an area of predominantly rural land use with interspersed towns and villages. The Scoping Report Corridor runs mainly through agricultural fields, crosses several

hedgerows and two unnamed roads. Full details of the Scoping Report Corridor are presented in Chapter 2 Scoping Report Corridor and the Proposed Development.

Environmental Setting

Geology

- 10.2.5 The BGS mapping does not indicate any areas of artificial ground (made ground) within the Scoping Report Corridor.
- 10.2.6 Superficial deposits are noted to be generally present in valleys bottoms and along the routes of surface water courses where these are present along the route. These superficial deposits tend to be absent in elevated locations along the route corridor. The superficial deposits, where present, vary and as recorded by the BGS comprise:
- Peat;
 - Till;
 - Alluvium;
 - Head;
 - Hummocky (moundy) Glacial Deposits;
 - Glaciofluvial Fan Deposits;
 - Glaciofluvial Deposits; and
 - River Terrace Deposits.
- 10.2.7 Solid geology along the scheme comprises the following units:
- Penstrowed Grits Formation;
 - Nant-ysgollon Mudstone Formation;
 - Dolgau Mudstones Formation;
 - Glanyrafon Formation;
 - Pysgotwr Grits Formation;
 - Caerau Mudstones Formation; and
 - Rhayader Mudstones Formation.
- 10.2.8 No statutory, non-statutory, or nationally designated geological sites (including SSSIs, UNESCO sites, rare, national or locally important geology) are recorded within the Scoping Report Corridor.

Hydrology

- 10.2.9 A series of rivers and associated tributaries are present along the Scoping Report Corridor including the Afon Hafren/River Severn.
- 10.2.10 The rivers are classified in accordance with the Water Framework Directive (WFD) (River Basin Management Plan) for their chemical and ecological status. Most of the rivers within the Scoping Report Corridor display good classifications, with some displaying moderate.
- 10.2.11 The Scoping Report Corridor is not within a drinking water (surface water) protected area).
- 10.2.12 Further details of the hydrology are presented in Chapter 13 Flood risk, hydrogeology and hydrology.

Hydrogeology

- 10.2.13 The Scoping Report Corridor is located within the Severn Uplands – Lower Palaeozoic WFD groundwater body. The overall WFD classification of this groundwater body is poor as assessed in the WFD Cycle 3 assessment.
- 10.2.14 The superficial deposits are classified as Secondary A, Secondary B and Secondary Undifferentiated aquifers. The predominant classification is Secondary A.
- 10.2.15 The solid geology is classified as Secondary A, Secondary B and Secondary Undifferentiated aquifers with the Secondary Undifferentiated aquifers present only in the north of the Scoping Report Corridor.
- 10.2.16 The Scoping Report Corridor is not within a source protection zone (SPZ) or groundwater drinking water protected area.
- 10.2.17 A more detailed description of the hydrogeology is presented in Chapter 13 Flood risk, hydrogeology and hydrology.

Ground gas

- 10.2.18 The presence of made ground is not anticipated and is unlikely to be encountered across the Scoping Report Corridor given the location and historical activities within the Scoping Report Corridor. No significant sources have been identified therefore potential for gas generation from made ground is currently considered to be negligible.
- 10.2.19 Peat horizons have been identified in parts of the Scoping Report Corridor. Given the small footprint of the pylons, potential for gas generation from the peat and creation of preferential pathways is considered negligible. Within the area of proposed underground cabling peat is generally absent and therefore the risk of gas generation from peat is considered negligible.

Ground contamination

- 10.2.20 Current guidance on contaminated land assessment uses the principal of a Conceptual Site Model (CSM) to establish pollutant linkages using the source-pathway-receptor methodology. For a source of contamination (or hazard) to present a risk to a receptor (such as construction workers or groundwater), there must be a viable exposure pathway.
- 10.2.21 Based on a review of available information by Sweco and with regards to the typical past and current use of land in the Scoping Report Corridor, no potentially significant contaminant sources have been identified associated with the Scoping Report Corridor.

10.3 Receptors

- 10.3.1 The key potential receptors have been identified as follows:

- Human health
 - Construction and maintenance workers for the proposed development
 - Users of public open space
 - Off-site residents
- Groundwater
- Flora and fauna

- 10.3.2 Remaining receptors have been excluded due to the short timespan of the construction of each location minimising the risk of exposure.

- 10.3.3 Surface water has been excluded from assessment as the pylons and below ground cables are unlikely to interact with surface water in any significant manner minimising the potential for negative impacts.

10.4 Scoping of Impacts

- 10.4.1 Table 10.1 and Table 10.2 present a summary of the scoping. They identify which likely environmental effects, with respect to the proposed development will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 10.1: POTENTIAL LAND QUALITY IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Presence and disturbance of contaminated ground and associated effects as a result of construction	No	Made ground is not anticipated to be present across the Scoping Report Corridor given the location and historical activities within the Scoping Report Corridor and no significant sources have been identified. Potential for made ground to be encountered is very low. The design of foundations does not require significant disturbance of the soil. On this basis, the likely presence and subsequent disturbance of contaminated ground is limited. A Construction Environmental Management Plan (CEMP) will set out controls to ensure the very low risks associated with contamination are appropriately managed and further minimised during construction. Additionally, this will set out appropriate measures for dealing with the unlikely presence of unidentified contamination. Mitigation measures within the CEMP shall include best practice environmental management procedures and appropriate waste management. The application of a CEMP during construction mitigates any potential risks sufficiently that it is not necessary to consider this potential impact further within the EIA process.
Potential for ground gas and vapour migration	No	Made ground is unlikely to be present across the Scoping Report Corridor given the location and historical activities in the vicinity and no significant sources have been identified. Potential for gas generation is currently considered to be negligible. Peat horizons have been identified in parts of the Scoping Report Corridor, however, given the design of the 'H' poles and location of the underground cabling risks are considered negligible. Potential risks to human health receptors are limited to those during construction and potential risks can be mitigated via application of the construction phase health and safety measures within the CEMP.
Potential effect of contaminated land run-off into adjacent surface water or leaching/migration into groundwater	No	Made ground is unlikely to be present across the development area given the location and historical activities in the vicinity and no significant sources have been identified. A CEMP will set out controls to ensure the very low risks associated with contamination are appropriately managed and minimised during construction. Additionally, this will set out appropriate measures for dealing with unidentified contamination. Mitigation measures within the CEMP shall include best practice environmental management procedures and appropriate waste management. The application of a CEMP during construction mitigates any potential risks sufficiently that it is not necessary to consider this potential impact further within the EIA process.
Is the project likely to affect designated geological sites (statutory or non-statutory)?	No	No statutory or non-statutory or nationally designated geological sites (includes SSSIs, UNESCO sites, rare, national or locally important geology) recorded within the Scoping Report Corridor.
Is the project likely to introduce significant	No	The proposed development will be constructed with regards to relevant legislation and designed in such a way as that construction will not introduce new sources of contamination.

Potential Impact	To be assessed in EIA	Reason
sources of contamination?		

TABLE 10.2: POTENTIAL LAND QUALITY IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Use of proposed development by workers and general public	No	The proposed development will not introduce contaminated material with limited surface disturbance required. The installed infrastructure will be managed with regards to relevant environmental standards. Consequently, no significant impacts are anticipated and the assessment of impacts during operation is scoped out.
Is the project likely to affect designated geological sites (statutory or non-statutory)?	No	No statutory or non-statutory or nationally designated geological sites (includes SSSIs, UNESCO sites, rare, national or locally important geology) recorded within the proposed scheme's boundary.

10.5 Mitigation

Primary and Tertiary Mitigation

10.5.1 Mitigation that will apply to the proposed development and activities associated with it irrespective of the EIA process can be divided into two broad categories:

- Primary i.e. in the form of prevention or reduction of adverse effects through the resource efficient design, construction and lifetime operation of the proposed development.
- Tertiary (or inexorable) that are in place due to legislative drivers and are typically enforced by regulators, irrespective of the EIA process.

Legislation

10.5.2 The following legislation, standards and best practice guidelines are considered relevant to the proposed development. Their application to minimise risks and impacts of any potential land contamination would provide mitigation:

- Environment Agency. Land Contamination Risk Management (LCRM). How to assess and manage the risks from land contamination, October 2020;
- Environmental Protection Act 1990, Part II, Section 34 - sets out the legal framework for 'duty of care';
- DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, September 2009;
- Environmental Protection (Duty of Care) Regulations 1991 (as amended 2003);
- Contaminated Land Risk Assessment – A Guide to Good Practice C552 (CIRIA, 2001); and
- Construction (Design & Management) Regulations (CDM 2015) relating to the management of health, safety and welfare associated with construction projects and includes requirements to prepare Pre-construction Information (PCI) and a CPP.

Best Practice

- 10.5.3 The implementation of a Construction Environmental Management Plan (CEMP) would set out controls to ensure potential risks to the environment are appropriately managed and minimised. Mitigation measures within the CEMP would include best practice environmental management procedures and appropriate waste management, such as:
- Ensuring adequate space for storage of topsoil and subsoil which must be segregated during excavation;
 - Protection of watercourses from entry of polluting matter;
 - Stripping, storing and reinstating of soils using best practice measures to minimise the risk of degradation to soils;
 - Suppression of odour and dust using best practice measures; and
 - Procedures for managing unknown contamination.
- 10.5.4 The application of an CEMP and Materials Management Plan (MMP) (see Chapter 12 Material Assets and Waste) along with best practice for site operations, such as bunded fuel storage tanks and appropriate materials storage, will mitigate associated risks. To protect construction workers on site, Personal Protection Equipment (PPE) will be supplied, and considerate construction practices will be used and applied to further reduce risks to human health both onsite and offsite. The construction phase health and safety plan (CPP) will contain details of risk management procedures, including emergency response plans.
- 10.5.5 Risk of spillages or leakages during construction is not considered to be significant but this risk will be managed as a priority during the works through the appropriate management plans and specific construction mitigation measures, such as appropriate works methodologies for the proposed works, appropriate storage of materials, strategic placing of spill kits and emergency response procedures included in the CEMP.
- 10.5.6 Construction activities typically include the use of heavy plant and machinery and suitable measures will be in place to minimise noise and air emissions for the duration of the works.
- 10.5.7 Excavation works associated with the proposed development have the potential to directly damage any underlying geological features. However, since the proposed development is not located within a geologically protected site, and there are no important geological deposits present on site, it is anticipated that there would be no significant direct impacts upon the geology during construction.
- 10.5.8 The design of the double wood 'H' poles is such that the foundations are shallow and therefore will not significantly interact with geology. Similarly, the below ground section of cable will not be at significant depth and therefore the potential interaction with geology is limited.
- 10.5.9 Further to the aspects considered in the foregoing sections it is considered that in relation to ground conditions and contaminated land the extent of primary and tertiary mitigation measures:
- Will be sufficiently in place to mitigate any potential impacts;
 - The approaches are commonplace and no unique or novel approaches will be necessary;
 - There is sufficient evidence that adverse effects will be precluded; and
 - It is our professional opinion that the development does not have the potential to result in significant adverse environmental impacts upon ground conditions and contaminated land.
- 10.5.10 The assessment of land quality during the operational phase of the proposed development has been scoped out. Significant environmental effects that might cause ground contamination are unlikely during the operation of the proposed development.
- 10.5.11 A CEMP will be prepared prior to commencement of construction in parallel to the development of the proposed development design and construction methodologies. Measures and procedures in the CEMP

will include design and construction mitigation, which will be developed in more detail in later stages of the design and implemented during construction. It will include the adoption and implementation of industry standard practice and measures for controlling any adverse residual impacts of the proposals on land quality.

- 10.5.12 Therefore, it is considered that all potential impacts associated with land quality should be scoped out for both construction and operational stages of the proposed development.

11 Soils and Agriculture

11.1 Introduction

- 11.1.1 This chapter of the Scoping Report identifies potential impacts with regard to Soils, Agriculture and Peat that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.

11.2 Baseline

- 11.2.1 The following sources of information have been reviewed during desk-based research to inform this Scoping Report:
- Soil Survey of England and Wales Sheet 2 Wales (part of National 1:250,000 scale soil map) and accompanying legend;
 - British Geological Survey (BGS) online mapping for bedrock and superficial geology⁴⁸;
 - The Predictive Agricultural Land Classification Map 2 with respect to the potential location of Best and Most Versatile (BMV) Agricultural Land⁴⁹;
 - Peatlands of Wales⁵⁰;
 - Meteorological Office. (1989). Climatological Data for Agricultural Land Classification; and
 - OS mapping and aerial photography with respect to current land use⁵¹.
- 11.2.2 The study area for soils and agriculture will cover the site encompassed by the Scoping Report Corridor (as shown in Figure 1.1). This will be sufficient to identify risks to soils and agriculture and the measures potentially required to mitigate any otherwise negative effects caused by the proposed development.
- 11.2.3 No consultation regarding soils and agriculture has been undertaken to date. A significant amount of information has been obtained about soil types, soil quality, climate and land use from published sources.

Land use and climate

- 11.2.4 The ALC climatic data for the Scoping Report Corridor indicates the area as wet and warm. The ALC climatic grade varies from 2 to 5; the 2 being west of Caersws and between Llandinam and Llanidloes along the River Severn valley. The climatic limitation to soil and land use is high rainfall. Generally, over the corridor the soil will be above field capacity for more than 250 days so the number of days the land will be suitable for cultivation in the spring and autumn will be limited. This limits the potential of the land for growing arable and horticultural crops even if the soil was suitable. Aerial photography and OS mapping indicate the agricultural land use within the Scoping Report Corridor to be predominantly grass for grazing and conservation. There is an area of approximately 100 hectares of land in arable production to the west and south-west of Llandinam and several small areas of woodland distributed throughout the Scoping Report Corridor.

Soil types

- 11.2.5 There are a number of soil associations mapped along the Scoping Report Corridor. These are described in Table 11.1. The soils range from well drained soils over rock e.g. Parc, Manod, Hafren and Denbigh associations to slowly permeable soils with seasonally waterlogging e.g. Brickfield 1, Brickfield 3 and Wilcocks 2 associations. Overall, there is a relatively similar area of seasonally waterlogged slowly permeable soils and well drained soils over rock within the Corridor. The well drained soils over rock are

⁴⁸ British Geological Survey. Available at: <https://bgs.ac.uk/map-viewers/bgs-geology-viewer/>

⁴⁹ Data Map Wales. Predictive Agricultural Land Classification (ALC) Map 2. Available at: https://datamap.gov.wales/layers/inspire-wg:wg_predictive_alc2

⁵⁰ Data Map Wales. (2022). Peatlands of Wales Maps. Available at:

⁵¹ Google Earth Pro. (2024)

predominately found to the south and north-east of Llanidloes, south of Trefeglwys and Caersws. There are small areas of soil associations formed in river alluvium (Conway and Teme), particularly along the River Severn valley between Trefeglwys and Caersws.

- 11.2.6 Peat deposits are mapped within the Scoping Report Corridor, including around Rhyd, Bwlch y Garreg, Cwmbelan and Llangurig.
- 11.2.7 It is noted that some of the soil associations (Wilcocks 1, Wilcocks 2, Hafren and Brickfield 1) are described as having a peaty surface horizon.
- 11.2.8 Descriptions of the soil associations likely to be encountered within the Scoping Report Corridor are given in Table 11.1 below. The information is taken from the legend for the 1:250,000 scale National Soil Map. British Geological Survey (BGS) online mapping would indicate the geology as mostly Palaeozoic mudstones to the south of the Scoping Report Corridor, mudstones and siltstones in the central area, and mudstones and sandstones to the north.

TABLE 11. 1: SOIL ASSOCIATIONS MAPPED WITHIN THE SCOPING REPORT CORRIDOR

Soil Association	Geology	Soil characteristics and site characteristics
MANOD (611c)	Palaeozoic slate, mudstone and siltstone	Well drained fine loamy or fine silty soils over rock. Shallow soils in places. Bare rock locally. Steep slopes common.
BRICKFIELD 3 (713g)	Drift from Palaeozoic sandstone and shale	Slowly permeable seasonally waterlogged fine loamy, fine loamy over clayey and clayey soils.
TEME (561b)	River alluvium	Deep stoneless permeable silty soils. Some similar soils variably affected by groundwater. Gravelly subsoil in places. Flat land. Risk of flooding.
BRICKFIELD 1 (713e)	Drift from Palaeozoic sandstone and shale	Slowly permeable seasonally waterlogged fine loamy and fine silty soils, some with wet peaty surface horizons.
WILCOCKS 2 (721d)	Drift from Palaeozoic sandstone, mudstone and shale	Slowly permeable seasonally waterlogged loamy upland soils with a peaty surface horizon. Some very acid peat soils.
HAFREN (654a)	Palaeozoic slaty mudstone and siltstone	Loamy permeable upland soils over rock with a wet peaty surface horizon and bleached subsurface horizon, often with thin iron pan. Some peat on higher ground. Rock and scree locally.
CONWAY (811b)	River alluvium	Deep stoneless fine silty and clayey soils variably affected by groundwater. Flat land. Risk of flooding.
DENBIGH 1 (541j)	Palaeozoic slaty mudstone and siltstone	Well drained fine loamy and fine silty soils over rock. Some similar soils with slowly permeable subsoils and slight seasonal waterlogging. Shallow soils and some bare rock locally.
RHEIDOL (541v)	Glaciofluvial or river terrace gravel	Well drained fine loamy soils over gravel, shallow in places. Some related soils affected by groundwater in hollows.
WILCOCKS 1 (721d)	Drift from Palaeozoic sandstone, mudstone and shale	Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey upland soils with a peaty surface horizon. Coarse loamy soils affected by groundwater in places. Very acid where not limed.

Agricultural Land Quality

- 11.2.9 Land quality is determined using the Agricultural Land Classification (ALC) of England and Wales revised guidelines (MAFF, 1988).
- 11.2.10 Welsh Government's Predictive Agricultural Land Classification Map 2 depicts the majority of land within the Scoping Report Corridor to be subgrade 3b or poorer quality (i.e. not BMV land). BMV land (grade 2 and subgrade 3a) is predicted along river valleys in the vicinity of Trefeglwys, Caersws and Llanwnnog (grade 3a with small areas of grade 2); and from the south-west of Llanidloes adjacent to the River Severn to the north of Llandinam (grade 2 and 3a).
- 11.2.11 The predominate grade of land is predicted to be grade 4 in the southern half of the Scoping Report Corridor and subgrade 3b in the northern half. The predicted grade 4 land appears to be predominantly on land mapped as Manod and Brickfield 1 associations. Land predicted to be BMV (grade 2/3a) is mostly on land mapped as Conway association, soils developed in river alluvium. Based on the predictive ALC map, approximately 8% of the land within the Scoping Report Corridor is likely to be BMV.

11.3 Receptors

- 11.3.1 The key potential receptors have been identified as follows:
- The presence of BMV (as defined in the ALC guidance published by MAFF in 1988 as land comprising Grades 1, 2 and 3a;
 - The soil resources and the soil ecosystem services they provide (which relates to the health of the soil and the soil functions); and
 - Peat soils

11.4 Scoping of Impacts

- 11.4.1 Table 11.2 and Table 11.3 present a summary of the scoping. They identify which likely environmental effects, with respect to Soils, Agriculture and Peat will be assessed in the EIA (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 11.2: POTENTIAL SOILS AND AGRICULTURE IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
BMV agricultural land use and permanent loss of agricultural land	Yes	During construction there would be potential temporary effects on agricultural operations due to disturbance (in particular where livestock are present), fragmentation, access restrictions or disruption to water supplies or land drainage. The footprint of the pylons will result in some permanent land loss. Also, depending on the location of pylons in fields, pylons have the potential to slow field machinery operations by having to manoeuvre around them. If the project includes other permanent infrastructure such as substations or access tracks to pylons, this would also result in some permanent loss of land The measures set out within the Construction Environmental Management Plan (CEMP) would

		reduce the effects to agricultural land use. Effects on land drainage are covered in Chapter 13 Flood Risk, Hydrology and Hydrogeology. By the end of the construction phase, all land required temporarily would be reinstated. As the footprint of the permanent infrastructure is limited it is considered that, on completion of the reinstatement of the land required temporarily, there would be no significant effects on agricultural landholdings. As there is the potential for disruption to land use during construction and some permanent loss of land to agricultural use, the effects are scoped into the ES.
Soil quality and associated ecosystem services	No	During construction, there would be disturbance to soils due to the excavation and soil stripping from associated working areas for the underground cable and overhead line installation and associated infrastructure. Therefore, there is the potential for effects on the ecosystem services that the soils provide. The good practice measures which will be set out within the CEMP and the good practice soil management measures which will be set out within the Soil Resource Management Plan (SRMP) for soil handling, storage and reinstatement, would reduce the effects on soils. By the end of construction, all land required temporarily would be reinstated and no significant long-term effects on soil are expected. It is therefore proposed to scope this aspect out of the ES.
Peat soils	Yes	The Unified Peat Map of Wales and BGS data indicate the presence of potential peat deposits within the Scoping Corridor. As the Project design evolves, suitable peat surveys will be undertaken and the findings used to inform the design of the Project. However, the potential for significant effects on peat cannot be ruled out at this scoping stage. Therefore, peat is proposed to be scoped into of the EIA during the construction phase.

TABLE 11.3: POTENTIAL SOILS AND AGRICULTURE IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Temporary BMV agricultural land use	No	All temporary construction infrastructure will have been removed and the land restored prior to the operation phase, with only small areas of

		land around overhead line pylons temporarily lost to agriculture during this phase. Therefore, no likely significant effects are expected and operational effects on land use are scoped out of the ES.
Soil quality and ecosystem services	No	Maintenance and repair works that may result in the disturbance of soils during operation would be undertaken in accordance with standard good practice soil handling methods (see above). Therefore, no likely significant effects are expected during the operational phase and it is proposed to scope this matter out of the ES.
Peat soils	No	Once project infrastructure has been installed and temporary construction areas restored, there are not expected to be any further significant impacts upon peat.

Mitigation

- 11.4.2 Mitigation measures would primarily focus on following guidance set out in a SRMP produced for soil handling across the corridor particularly during the construction phase. The SRMP should be produced using guidance set out in Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Other sources of information such as that contained in the Good Practice Guide for Handling Soils In Mineral Works produced by the Institute of Quarrying may also be helpful. The SRMP would cover handling of soil during stripping and reinstatement.
- 11.4.3 Soil surveying for the SRMP would be carried out at appropriate detail so that it can also be used for ALC classification. ALC data would be used to assess the significance of any land loss against the criteria set out in the Institute of Environment Management and Assessment (IEMA, 2022), A New Perspective on Land and Soil in Environmental Impact Assessment.
- 11.4.4 Mitigation may also involve production of a Construction Environmental Management Plan (CEMP).
- 11.4.5 A stand-alone Peat Management Plan (PMP) will be prepared using guidance set out in Countryside Council for Wales (CCW): Guidance note assessing the impact of wind farm developments on peatlands in Wales (2010) and the Scottish Environmental Protection Agency (SEPA): Peatland development documents (in the absence of Welsh guidance). The PMP will outline mitigation measures to be implemented during construction to minimise effects on peat.

11.5 Methodology for Impact Assessment

Legislation and guidance

- 11.5.1 Relevant guidance specific to the assessment of soils and agriculture that will inform the assessment comprises:
- A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022)⁵²;
 - Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land (MAFF 1988);

⁵² IEMA. (2022). A New Perspective on Land and Soil in Environmental Impact Assessment. Available at: <https://www.iema.net/resources/blog/2022/02/17/launch-of-new-eia-guidance-on-land-and-soils>

- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites Defra (2009)⁵³;
- Welsh Government. Agricultural Land Classification Guidance and Services (web link: <https://gov.wales/agricultural-land-classification>);
- The Second State of Natural Resources Report (SoNaRR) Assessment of the achievement of sustainable management of natural resources: Land use and soils Natural Resources Wales (2020)⁵⁴.

Proposed Assessment Method

- 11.5.2 A desk study of published information covering geology, climate, flooding risk, soils, agricultural land classification and current agricultural use will be carried out.
- 11.5.3 Following the desk study an on-site survey soil survey of the pylon corridor will be carried out according to criteria set out in Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land (MAFF 1988) and the Welsh Government (web link: <https://gov.wales/agricultural-land-classification>).
- 11.5.4 The results of the on-site soil survey together with the climatic and flooding risk information from the desk study will allow the land to be accurately ALC graded to confirm (or otherwise) the Wales ALC2 predictive grades. The ALC grading can then be used to assess the significance of any permanent or temporary land loss against criteria set out in A New Perspective on Land and Soil in Environmental Impact Assessment (IEMA, 2022). The effect of different routes for the pylon corridor could also be assessed.
- 11.5.5 Importantly the on-site soil survey work will provide the baseline information for producing the SRMP.
- 11.5.6 The study area used for scoping may be revised to reflect subsequent project route amendments and additional proposed infrastructure as the proposals are refined.

⁵³ Defra. (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at: <https://assets.publishing.service.gov.uk/media/5b2264ff40f0b634cfb50650/pb13298-code-of-practice-090910.pdf>

⁵⁴ Natural Resources Wales. (2020). State of Natural Resources Report (SoNaRR) for Wales 2020. Available at: <https://naturalresources.wales/evidence-and-data/research-and-reports/state-of-natural-resources-report-sonarr-for-wales-2020/?lang=en>

12 Material Assets and Waste

12.1 Introduction

- 12.1.1 This chapter of the Scoping Report identifies potential impacts with regards to Material Assets and Waste that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.
- 12.1.2 This scoping exercise has been undertaken using professional judgement, alongside guidance produced by the Institute of Environmental Management and Assessment (IEMA) "Materials and Waste in Environmental Impact Assessment: Guidance for a proportionate approach" (IEMA 2020)⁵⁵.

12.2 Baseline

- 12.2.1 In accordance with IEMA 2020 guidance, this scoping chapter documents the initial baseline to make recommendations on the scope for assessment if required.

Study Areas

- 12.2.2 Two study areas are proposed for materials and waste:
- The proposed development study area comprises the Scoping Report Corridor, which includes any areas required for temporary access, site compounds, working platforms and other temporary working areas; and
 - The expansive study area extends to the availability of construction materials, and capacity of waste management infrastructure and remaining landfill void within Wales and the Powys sub-region. There are no hazardous waste landfill sites in Wales. Using the proximity principle, the study area for the management of hazardous wastes is the south west England region.

Primary (Virgin) Aggregates

- 12.2.3 Collation of the results of the 2019 Aggregate Minerals Survey for England and Wales⁵⁶ reported:
- 737.8 million tonnes of total reserves of primary aggregates in Wales; and
 - Total primary aggregate sales of 14.6 million tonnes in 2019, with 11.1 million tonnes consumed in 2019.
- 12.2.4 The Powys Adopted Local Development Plan (LDP) 2011 to 2026⁵⁷ notes that the Council as Minerals Planning Authority (MPA) must maintain a minimum land-bank (permitted reserves) of 10 years for crushed rock aggregates throughout the Plan Period at the agreed rate of 2.51 million tonnes per annum for its contribution to the South Wales regional aggregate supply. The MPA has no requirement to contribute sand and gravel to the regional supply.

Alternative (Secondary and Recycled) Aggregates

- 12.2.5 Natural Resources Wales (NRW) Construction and Demolition Waste Survey for 2019⁵⁸ reported:
- Approximately 3.40 million tonnes of construction and demolition (C&D) waste generated in Wales in 2019;

⁵⁵ IEMA (2020). Materials and Waste in Environmental Impact Assessment, March 2020. Available online at:

<https://www.iema.net/resources/reading-room/2020/03/30/materials-and-waste-in-environmental-impact-assessment>

⁵⁶ British Geological Survey (2021) Collation of the Results of the 2019 Aggregate Minerals Survey for England and Wales. Decarbonisation and Resource Management Programme Open Report OR/21/024, 2021. Available online at:

https://assets.publishing.service.gov.uk/media/627e67e6d3bf7f053b9b627f/AM2019_National_Collation-Final.pdf

⁵⁷ Powys County Council (2017) Adopted Powys Local Development Plan 2011 to 2026 (adopted April 2017). Available online at: <https://en.powys.gov.uk/article/4898/Adopted-LDP-2011---2026>

⁵⁸ Construction and Demolition Waste Survey for 2019 Available online at: <https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/construction-and-demolition-waste-survey-2019/?lang=en#:~:text=An%20estimated%20116%20thousand%20tonnes,for%2049kt%20and%2048kt%20respectively>

- Of the C&D waste approximately 45% comprised mixed wastes (which included mixed aggregates) whilst approximately 7% was specifically segregated aggregates. The segregated aggregates represented approximately 260,000 tonnes; and
- Overall approximately 75% of C&D waste (2.6 million tonnes) was recycled.

Concrete, Steel and Timber

- 12.2.6 The Mineral Products Association⁵⁹ reported 52.7 million tonnes of ready-mix concrete was produced in the UK's 1,062 concrete and mortar plants during 2021.
- 12.2.7 The Welsh Government⁶⁰ reported approximately 373,000 tonnes of steel were produced in Wales during 2022.
- 12.2.8 NRW's Timber Sales and Marketing Plan 2021 to 2026⁶¹ states that during this period they will offer a consistent and sustainable timber supply to the market. This complements the sustainable management of the Welsh Government Woodland Estate (WGWE) whose general duty is afforestation, production and supply of timber. The volume of timber brought to market each year is anticipated to be between 735,000m³ to 835,000m³.
- 12.2.9 NRW's management of the WGWE is externally audited each year to international standards of forest certification, as set out in the UK Woodland Assurance Standard (UKWAS). Certification against UKWAS is a verification of their sustainable management of the WGWE, reaching Forest Stewardship Council® (FSC®) and Programme for the Endorsement of Forest Certification (PEFC) international standards.

Mineral Safeguarding

- 12.2.10 Several Mineral Safeguarding Areas (MSA) have been designated for sand and gravel, sandstone, limestone, igneous rocks and surface coal on and in the vicinity of the Scoping Report Corridor as detailed in the Powys LDP. Although there are twelve existing mineral sites within Powys (anticipated to be operational after 2024), no existing mineral sites lie within the Scoping Report Corridor. The closest (H V Bowen & Sons (Quarry) Ltd Tan y Foel Quarry) is located 40 m east of the Scoping Report Corridor at Brynllugan.
- 12.2.11 The Powys LDP indicates that it is not considered necessary to allocate new sites for coal, hard rock or sand and gravel.

Landfill Capacity

- 12.2.12 Landfill capacity⁶² is considered and not the capacity of all waste management infrastructure as disposal to landfill and use of available landfill capacity is, overall, a permanent, irreversible impact. Impacts on other types of waste management infrastructure (for example material recovery facilities) are temporary, with such waste management infrastructure better placed to react to demands of the waste management market.
- *Non-hazardous Landfill:* There are twelve non-hazardous landfill sites in the combined regions of Wales with a total remaining capacity of approximately 8,290,000m³.
 - *Inert Landfill:* There are six inert landfill sites in the combined regions of Wales with a total remaining capacity of approximately 1,840,500m³.

⁵⁹ MPA (2023) Profile of the UK Mineral Products Industry (2023). Available online at: https://www.mineralproducts.org/MPA/media/root/Publications/2023/Profile_of_the_UK_Mineral_Products_Industry_2023.pdf

⁶⁰ Stats Wales. Available online at: <https://stats.wales.gov.wales/Catalogue/Business-Economy-and-Labour-Market/Economic-Indices/Indices-of-Production-and-Construction/ironandsteelproduction-by-year-measure-area>

⁶¹ Natural Resources Wales, Timber Sales and Marketing Plan 2021-2026. Available online at: <https://naturalresources.wales/about-us/what-we-do/strategies-and-plans/timber-sales-and-marketing-plan-2021-2026/?lang=en>

⁶² Remaining Landfill Void in Wales, Natural Resources Wales, published 2020. Available online at: <https://datamap.gov.wales/documents/3249>

- *Stable Non-reactive Hazardous Waste (SNRHW) cell⁶³ within a Non-hazardous Landfill:* Wales landfill capacity data dated 2012⁶⁴ reported a remaining capacity of 3,221,000m³ at that time. No information on the remaining capacity of SNRHW cells in Wales is provided in NRW's remaining landfill void data (published 2020).
- *Hazardous Landfill:* There are no hazardous landfills in Wales. Using the proximity principle, the closest hazardous waste landfills are located in the south west region of England which had a remaining capacity of 1,179,836m³ at the end of 2022⁶⁵.

12.3 Receptors

12.3.1 The key potential receptors have been identified as follows:

- Consumption of materials and products from primary, recycled or secondary, and renewable sources, the use of materials offering sustainable benefits, and the use of excavated and other arisings that fall within the scope of waste exemption criteria;
- Sterilisation of mineral reserves; and
- Production and disposal of waste.

12.4 Scoping of Impacts

12.4.1 Table 12.1 and Table 12.2 identify which potential environmental impacts, with respect to construction and operation, will be assessed as part of the EIA. Those impacts that are considered to have the potential for significant effects are scoped into the assessment.

12.4.2 The proposed development will be undertaken in consideration of the Welsh Government's Technical Advice Note 21: Waste (February 2014)⁶⁶ states:

"... [this document] provides advice on how the land use planning system should contribute towards sustainable waste management and resource efficiency, reflecting the new waste management drivers at a European Union and Wales level. The Welsh Government's overarching waste strategy for Wales, 'Towards Zero Waste - One Wales: One Planet', sets out a long-term framework for resource efficiency and waste management in Wales up until 2050, taking into account social, economic and environmental outcomes. Achieving the aims in Towards Zero Waste relies on a suite of waste sector plans. These provide details on how the outcomes, targets and policies in Towards Zero Waste are to be implemented."

12.4.3 The tables include details of mitigation that is mentioned in earlier sections and can be classified, as described in IEMA's guidance, into:

- Primary i.e. in the form of prevention or reduction of adverse effects through the resource efficient design, construction and lifetime operation of a development; and
- Tertiary (or inexorable) that are in place due to legislative drivers and are typically enforced by regulators, irrespective of the EIA process.

⁶³ Some non-hazardous sites can accept some SNRHW into a dedicated cell, but this is usually permitted as a small part of the overall capacity of the site.

⁶⁴ Wales Waste Data 2012, Natural Resources Wales. Available online at: <https://naturalresources.wales/evidence-and-data/research-and-reports/waste-reports/wales-waste-data-information-2012/?lang=en>

⁶⁵ Environment Agency Remaining Landfill Capacity: England as at End 2022. Available online at: <https://www.data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity>

⁶⁶ Welsh Government (2014) Technical Advice Note 21: Waste (February 2014). Available online at: <https://www.gov.wales/sites/default/files/publications/2018-09/tan21-waste.pdf>

TABLE 12.1: POTENTIAL MATERIAL ASSETS AND WASTE IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Changes in demand for materials	No	The proposed development is not considered to require significant quantities of materials. Of the materials required for construction those that are natural resources are not considered to be in short supply. The proposed development would be designed to avoid and minimise the environmental impacts of natural resources. Throughout the design process, a number of embedded mitigation features would be included with the potential to reduce consumption of natural resources. Specific mitigation measures may include, amongst others: • Proposed development designed to optimise a cut fill balance with minimal materials requiring import. • Application of the 'Principles of Designing Out Waste' to reduce the demand for resources. • Prioritising the use of secondary, recycled or site-won resources in accordance with the relevant legislation, standards and specification for the proposed development. • Implementing the principles of local and responsible sourcing of key resources. • A Construction Environmental Management Plan (CEMP) and where applicable, a Materials Logistics Plan (MLP), Site Waste Management Plan (SWMP) and Materials Management Plan (MMP) would be prepared and implemented. Through good construction practice and the local and regional availability of secondary and recycled aggregates it is considered that a high percentage of secondary and recycled aggregates could be achieved where technically appropriate and economically feasible.
Changes in baseline waste arisings	No	Due to the nature of the proposed development, which largely comprising driven timber poles with a localised section of open-cut service trenches, the volume of waste arisings are considered negligible in relation to the 3.40 million tonnes of C&D waste generated in Wales in 2019.
Changes in available landfill capacity	No	Due to the nature of the proposed development, significant quantities of waste arisings are not anticipated to be generated. The proposed development would be designed to avoid and minimise the environmental impacts of waste. Throughout the design process, a number of embedded mitigation features would be included with the potential to reduce waste generation. Specific mitigation measures may include, amongst others:

Potential Impact	To be assessed in EIA	Reason
		- The applicant will deal with waste materials in accordance with Waste (Miscellaneous Provisions) (Wales) Regulations 2011.⁶⁷ - Proposed development design optimised to maximise a cut-fill balance. - Application of waste hierarchy principles (prevent, re-use, recycle, recover) to the management of any waste that is generated (irrespective of total volume). - Construction waste: including cut-offs and excess concrete and bricks, etc will be managed by the contractor(s) in line with current local and national legislation and best practice such as WRAP's Achieving Good Practice Waste Minimisation and Management, Guidance for Construction Clients, Design Teams and Contractors⁶⁸. - The 'Principles of Designing Out Waste'⁶⁹ will be implemented. - Where C&D wastes and excavation arisings cannot be re-used within the proposed development, opportunities will be sought to re-use them on other construction projects or if this is not possible they will be diverted from landfill to another off-site development or sent to an appropriately licenced recovery, treatment and recycling facility. - Compliance with all relevant waste legislation relating to waste handling, storage, transport and disposal. - A CEMP and where applicable an MLP, SWMP and MMP will be prepared and implemented. If, in a worst-case-scenario, all waste generated from the project had to be disposed to landfill it would have to be an exceptionally large quantity to have a greater than 1% impact on the local regions inert/non-hazardous landfill capacity of circa 10,130,500m³. This is considered highly unlikely. However, through good construction practice and the local and regional availability of waste processing, treatment and recovery facilities, it is considered that the recovery and recycling of generated wastes (either on or off the proposed development) could be achieved where technically appropriate and economically feasible. Given the predominantly rural nature of the Scoping Report Corridor, it is unlikely that hazardous waste materials will be encountered and if so the quantity would probably be small to negligible. Moreover, if

⁶⁷ Waste (Miscellaneous Provisions) (Wales) Regulation 2011. Available online at: <https://www.legislation.gov.uk/wsi/2011/971/contents/made>

⁶⁸ WRAP (undated) Achieving Good Practice Waste Minimisation and Management, Guidance for Construction Clients, Design Teams and Contractors. Available online at: https://www.ciria.org/Resources/REK/Guidance/Achieving_good_practice_waste.aspx

⁶⁹ WRAP Designing Out Waste: A Design Team Guide for Civil Engineering (Part 1: Design Guide). Available online at: <https://www.ciria.org/CIRIA/Resources/REK/Guidance/Designing%20out%20waste%20guidance%20a%20design%20team%20guide.aspx>

Potential Impact	To be assessed in EIA	Reason
		encountered they would likely be processed, treated or recovered within the region at a non-landfill facility licenced to accept hazardous waste. Waste arisings requiring disposal to landfill would be expected to decline in the future in line with waste management targets and a drive to a more circular economy.
Changes to an allocated mineral site	No	Whilst available mapping shows there are several MSA within or close to the Scoping Report Corridor, in accordance with the Powys LDP, there are no allocated mineral sites within the region. Therefore, the proposed development is not considered likely to further constrain future extraction of deposits along the Scoping Report Corridor. There are no operational quarries within or close to the Scoping Report Corridor except the adjacent Tan y Foel quarry. There is currently a planning application (22/2217/FUL) pending consideration that relates to the proposed extension of this quarry eastwards, away from the Scoping Report Corridor. Any other future long term development proposals are not known for this quarry. Given the width of the Scoping Report Corridor, which allows considerable leeway of the final alignments of the OHL, it is considered unlikely that the proposed development will impact the quarry and its future operation.

TABLE 12.2: POTENTIAL MATERIAL ASSETS AND WASTE IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Changes in demand for materials	No	Significant environmental effects are considered unlikely during the operational phase (i.e. post-construction). This phase should only involve small-scale, routine or ad-hoc maintenance activities that would have minimal materials requirements and generate insignificant volumes of waste.
Changes in baseline waste arisings	No	
Changes in available landfill capacity	No	

12.4.4 In accordance with Table 12.1 and Table 12.2, it is considered appropriate for Material Assets and Waste to be scoped out of the EIA.

13 Flood Risk, Hydrogeology and Hydrology

13.1 Introduction

- 13.1.1 This chapter of the Scoping Report identifies potential impacts and the associated sources, pathways, and receptors modelled with regards to flood risk, hydrogeology, and hydrology that may occur during the construction and operation phases of the proposed development and outlines whether these will be addressed further in the Environmental Statement (ES) depending on their expected significance.

Legislation and Guidance

- 13.1.8 The assessment will be carried out according to the principals contained within the following legislation:
- The EU Water Framework Directive (2007/60/EC);
 - Groundwater Directive (2006/118/EC);
 - Land Drainage Act 1991;
 - Water Resources Act 1991;
 - Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- 13.1.9 The assessment will be conducted in accordance with the principles contained within the following guidance documents:
- Planning Policy Wales Technical Advice Note 15: Development and Flood Risk, 2004;
 - NRW Flood Estimation: Technical Guidance Reference number: GN008. 2017; and
 - CIRIA Report C692 – Environmental Good Practice Onsite. 3rd Ed. 2010.

13.2 Baseline

- 13.2.1 This section outlines the flood risk, hydrological, hydrogeological and drainage baseline information relative to the site encompassed by the Scoping Report Corridor. The work to date has been based on desk information.

Topography

- 13.2.2 The site encompassed by the Scoping Report Corridor consists of variable topography, covering several valley ranges, with elevations ranging from approximately 440m AOD in the northern section between Clatter and the proposed Llyn Lort Energy Park, to 130m AoD at the River Cerist floodplain near Trefeglwys.

Hydrogeology

- 13.2.3 The Scoping Report Corridor is located within the Severn Uplands – Lower Palaeozoic Water Framework Directive (WFD) groundwater body, which has an overall WFD Groundwater Bodies – Cycle 3 poor classification. This is the result of Good Quantitative and Poor Chemical classifications within the WFD Cycle 3 assessment⁷⁰.
- 13.2.4 The Scoping Report Corridor is underlain by secondary A, B and undifferentiated designated bedrock aquifers (BGS GeoIndex)⁷¹. The secondary undifferentiated aquifers are only present in the northern most extent of the application site.

⁷⁰ Water Watch Wales (2024) Water Framework Directive cycle 3 Rivers and Water bodies. Available: <https://waterwatchwales.naturalresourceswales.gov.uk/en/>

⁷¹ British Geological Survey (2024d) BGS Geology - 50k (DiGMapGB-50) Bedrock version 8. Available at: <https://www.data.gov.uk/dataset/214e7ef3-a1c2-4166-a4b6-0f365e9f88e5/bgs-geology-50k-digmapgb-50-bedrock-version-8>

- 13.2.5 The Scoping Report Corridor is predominantly underlain by secondary A superficial drift aquifers, with some secondary B and secondary undifferentiated superficial aquifers also present⁷².
- 13.2.6 Bedrock groundwater vulnerability within the Scoping Report Corridor, is of low, medium and high classified secondary aquifers^{73,74}.
- 13.2.7 Superficial groundwater vulnerability was found to have low, medium and high classifications^{75,76}.
- 13.2.8 The Scoping Report Corridor comprises low productivity aquifers, in which flow is virtually all through fractures and other geological discontinuities^{77,78}.
- 13.2.9 Within the Scoping Report Corridor, there are three identified water wells; two northwest of Clatter which exceed 30 m in depth, and a third east of Trefeglwys approximately 15 m in depth⁷⁹. Water wells are indicated on Figure 13.2. Superficial and bedrock geology are also shown. It is not currently known whether the wells are currently active, or whether additional active currently unidentified supplies exist. Consultation with NRW will be undertaken prior to drafting the ES to confirm the status of the wells and presence of any additional active wells.
- 13.2.10 A single granted Environmental Discharge Permit (BB3492FM) appears to be present within the Scoping Report Corridor⁸⁰. Consultation with NRW will be undertaken prior to drafting the ES to confirm the location of any discharges.
- 13.2.11 No documented Source Protection Zones (SPZ's), Groundwater Dependent Terrestrial Ecosystems (GWDTE's), Drinking Water Protected Lakes or Rivers are present within the Scoping Report Corridor^{81,82}.

Hydrology

- 13.2.12 The Scoping Report Corridor encompasses several main rivers and watercourses as listed below (Data Map Wales, 2022):

⁷² British Geological Survey (2024e) BGS Geology – 50k (DiGMapGB-50) Superficial version 8. Available at: <https://www.data.gov.uk/dataset/f2f96865-4ad5-4adc-b0f6-3e79e71f10c0/bgs-geology-50k-digmapgb-50-superficial-version-8>

⁷³ British Geological Survey (2024d) BGS Geology - 50k (DiGMapGB-50) Bedrock version 8. Available at: <https://www.data.gov.uk/dataset/214e7ef3-a1c2-4166-a4b6-0f365e9f88e5/bgs-geology-50k-digmapgb-50-bedrock-version-8>

⁷⁴ British Geological Survey (2024f) Groundwater Vulnerability Data for Wales. Available: <https://www.data.gov.uk/dataset/f9587ecd-9faf-483d-8473-b5f92f678aba/groundwater-vulnerability-data-for-wales>

⁷⁵ British Geological Survey (2024e) BGS Geology – 50k (DiGMapGB-50) Superficial version 8. Available at: <https://www.data.gov.uk/dataset/f2f96865-4ad5-4adc-b0f6-3e79e71f10c0/bgs-geology-50k-digmapgb-50-superficial-version-8>

⁷⁶ British Geological Survey (2024f) Groundwater Vulnerability Data for Wales. Available: <https://www.data.gov.uk/dataset/f9587ecd-9faf-483d-8473-b5f92f678aba/groundwater-vulnerability-data-for-wales>

⁷⁷ British Geological Survey (2024f) Groundwater Vulnerability Data for Wales. Available: <https://www.data.gov.uk/dataset/f9587ecd-9faf-483d-8473-b5f92f678aba/groundwater-vulnerability-data-for-wales>

⁷⁸ British Geological Survey (2024g) Hydrogeological Map of the United Kingdom and Isle of Man. Available: <https://www.data.gov.uk/dataset/5f4185d4-8b9e-4d3e-b4d0-6f8f7ab7599d/hydrogeological-map-of-the-uk-and-isle-of-man>

⁷⁹ British Geological Survey (2024b) Map Based Index (GeoIndex) Water Wells <https://www.data.gov.uk/dataset/6d0f1bf5-b055-4211-9ec6-1c3a4956698c/map-based-index-geoindex-water-wells>

⁸⁰ Data Map Wales (2024b) Permitted Discharges to Controlled Waters with Conditions. Available: https://datamap.gov.wales/layers/geonode:nrw_water_quality_permits

⁸¹ Water Watch Wales (2024) Water Framework Directive cycle 3 Rivers and Water bodies. Available: <https://waterwatchwales.naturalresourceswales.gov.uk/en/>

⁸² Data Map Wales (2023b) Source Protection Zones (SPZ) Merged. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_Source_Protection_Zones

- Afon Carno;
- Afon Trannon;
- Afon Cerist;
- Afon Hafren/ River Severn; and
- Unnamed watercourses associated with these water bodies.

13.2.13 Locations of the identified surface water bodies and unnamed watercourses within the Scoping Report Corridor are displayed in Figure 13.1.

13.2.14 The identified water bodies and unnamed watercourses within the Scoping Report Corridor fall within the Severn Uplands WFD Catchment⁸³. A summary of the WFD surface water body characteristics is provided below, based on the 2022 Cycle 3 status:

- Afon Carno - conf Afon Cwm-llwyd to conf R WFD water body (WBID: GB109054049250) has an overall good classification;
- Afon Trannon - source to nr Argoed WFD water body (WBID: GB109054049230) has an overall good classification;
- Afon Cerist – source to conf Afon Trannon WFD water body (WBID: GB109054044720) has an overall poor classification; and
- Severn - conf Afon Dulas to conf R Camlad WFD water body (WBID: GB109054049310)) has an overall moderate classification.

13.2.15 No WFD Lake water bodies are present within the Scoping Report Corridor, however a number of surface water features within the Scoping Report Corridor have been observed on aerial imagery and Ordnance Survey mapping^{84,85}. Their hydraulic connectivity with the water environment is currently unknown and will be considered where potentially relevant to the proposed development.

Flood Risk

13.2.16 Several areas of Flood Zone 2 and 3 associated with main rivers were identified within the Scoping Report Corridor (see Figure 13.1)⁸⁶. Flood Zone 2 is classified as areas with 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from rivers in a given year, including the effects of climate change. Flood Zone 3 is classified as areas with more than 1% (1 in 100) chance of flooding from rivers in a given year, including the effects of climate change.

13.2.17 There are multiple instances of Flood Zone 2 and 3 associated with surface water and small watercourses identified within the Scoping Report Corridor (see Figure 13.1). Flood Zone 2 is classified as areas with 0.1% to 1% (1 in 1000 to 1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change. Flood Zone 3 is classified as areas with more than 1% (1 in 100) chance of flooding from surface water and/or small watercourses in a given year, including the effects of climate change. Areas of flood risk are concentrated within low topography areas, at the confluences of multiple water bodies and of particular relevance to the proposed development are the areas of floodplain around Trefeglwys and the River Severn which are crossed by the Scoping Report Corridor.

⁸³ Water Watch Wales (2024) Water Framework Directive cycle 3 Rivers and Water bodies. Available: <https://waterwatchwales.naturalresourceswales.gov.uk/en/>

⁸⁴ Water Watch Wales (2024) Water Framework Directive cycle 3 Rivers and Water bodies. Available: <https://waterwatchwales.naturalresourceswales.gov.uk/en/>

⁸⁵ Data Map Wales (2022) Main Rivers. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_MAIN_RIVERS

⁸⁶ Data Map Wales (2023a) Flood Map for Planning Flood Zones 2 and 3. Available at: <https://datamap.gov.wales/layergroups/inspire-nrw:FloodMapforPlanningFloodZones2and3>

13.2.18 There are no historic flood events recorded within the Scoping Report Corridor⁸⁷.

13.2.19 A Flood Consequence Assessment (FCA) is likely to be required due to the presence of flood risk areas.

Designated Sites

13.2.20 No designated Ramsar, Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Sites of Special Scientific Interest (SSSIs) are present within the Scoping Report Corridor^{88,89}.

13.3 Receptors

13.3.1 The following key potential receptors have been identified:

- Four WFD water bodies and respective floodplains: Afon Carno, Afon Trannon, Afon Cerist, Afon Hafren/ River Severn;
- Unnamed watercourses; and
- Potential active private water supplies and discharges.

13.4 Scoping of Impacts

13.4.1 Table 13.1 and Table 13.2 present a scoping summary with respect to Flood Risk, Hydrology and Hydrogeology; this identifies environmental effects that will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 13.1: POTENTIAL FLOOD RISK, HYDROGEOLOGICAL AND HYDROLOGICAL IMPACTS - CONSTRUCTION

Potential Impact	EIA Assessed	Reason
Obstruction and changes in the flow direction and flow pathway of groundwater	Yes	Potential changes in the flow direction and flow path of local groundwater will be low due to the minimal excavation required. Perceived low risk further evident from the lack of sensitive receptors including important water resources or GWDTEs identified within the Scoping Report Corridor. Remaining risk will be mitigated through implementing best working practices, detailed within a Construction Environment Management Plan (CEMP). Perceived risk to active private water supplies and discharges to ground is low due to minimal anticipated excavations and subsequently negligible impact to groundwater quality and groundwater flow. Excavations for underground cabling is assumed to be shallow and any impact on groundwater expected to be minimal and construction impacts mitigated through the CEMP. In summary, perceived impacts to identified groundwater abstractions are believed to be minimal, but this is subject to confirmation of abstraction status and capabilities from each of

⁸⁷ Data Map Wales (2023c) Flood Alert Areas. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_FLOOD_WATCH_AREAS

⁸⁸ Water Watch Wales (2024) Water Framework Directive cycle 3 Rivers and Water bodies. Available: <https://waterwatchwales.naturalresourceswales.gov.uk/en/>

⁸⁹ Data Map Wales (2023b) Source Protection Zones (SPZ) Merged. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_Source_Protection_Zones

		the identified abstractions, hence this element has been scoped in.
Changes in the quality of groundwater at a localised level due to contamination.	Yes	Excavation and placement of poles below the water table may cause groundwater contamination due to direct contact between groundwater and construction materials. Perceived impacts are subject to further assessment and therefore Scoped in. The implementation of best practice measures detailed within the CEMP and the selective pole placement to areas of low groundwater impact or risk, will prevent the formation of contaminant pathways and mitigate this perceived risk. Excavations for underground cabling is assumed to be shallow and any impact on groundwater is expected to be minimal and construction impacts mitigated through the CEMP.
Increase or redirection of flood risk due to working within the flood plain or changes to flood flow pathways	Yes	Flood Zones 2 and 3 are present across the Scoping Report Corridor, which in combination with the ground profile and condition changes resulting from the installation of the poles and associated construction activities/storage, may result in increased or redirected flood risk. This could also be a potential risk for construction workers working in the floodplain. It is likely an FCA will be required to assess the risks to and from the proposed development and provide mitigation where required. Therefore, flood risk is scoped in. Flow pathways and floodplains may be altered due to working within, on or near water bodies and water courses. Surface water management should be provided as part of the CEMP, and permits and consents may be required, however this will be determined at the ES stage following the assessment.
Surface water contamination due to accidental spillages and reduction in water quality on receiving watercourses.	Yes	Risk of accidental spillages possibly polluting surface water during the construction phase, such as diesel fuel or lubricant oil from the mechanised machinery used during the construction phase. Alongside routine runoff, this could result in the deterioration of water quality in receiving receptors without adequate or appropriate mitigation, to be determined at the ES stage following the assessment. Therefore, this element is scoped in.

TABLE 13.2: POTENTIAL FLOOD RISK, HYDROGEOLOGICAL AND HYDROLOGICAL IMPACTS - OPERATION

Potential Impact	EIA Assessed	Reason
Increase or redirection of flood risk due to proposed redevelopment	No	The placement location of the posts is unknown at this stage and may result in an increase or redirection of flood risk. However due to the sizing of the poles the risk is considered to be minimal. Flood risk is scoped out, - however if an FCA is included as a planning condition it will be undertaken regardless, to assess the risks to and from the proposed development and provide mitigation where required. Climate change has the potential to increase the volume and peak rate of rainfall-runoff and thus surface water flood risk to areas within the Scoping Report Corridor and its surroundings, this will also be considered within the FCA in accordance with the Welsh Government's prevailing climate change allowance guidance.
Deterioration of groundwater quality	No	Due to the minimal size of the wooden posts, there are no identified operational hydrogeological or groundwater risks or impacts arising from the proposed development. This element is scoped out.
Deterioration of groundwater flow	No	Due to the minimal size of the wooden posts, there are no identified operational hydrogeological or groundwater risks or impacts arising from the proposed development. This element is scoped out.
Deterioration of surface water quality	No	Due to the minimal size of the wooden post structure, there are no identified operational hydrological risks or impacts arising from the proposed development. This element is scoped out.

13.5 Methodology for Impact Assessment

Flood Risk

- 13.5.1 An FCA will be submitted as part of the DNS application. A desk-based FCA will be prepared in accordance with the requirements of the Planning Policy Wales (PPW) document and associated Technical Advice Note 15: Development, flooding and coastal erosion (TAN 15).
- 13.5.2 Section 12 of the PPW TAN 15 document states that an FCA is required for any new development proposal located fully or partly within Flood Zones 2 and 3 for surface water and small watercourses, as well as for development with the potential to affect surface water flow pathways despite lying outside of these zones.
- 13.5.3 The FCA will consider both the risk of flooding to and from the proposed development from all sources, as well as the impact of climate change over the lifetime of the development. The assessment will be a desk-based study using existing data sources from NRW unless specific issues require further investigation for example through hydraulic modelling.
- 13.5.4 Further consultation with both the local authority and NRW, will be conducted to verify the collated data in addition to obtaining guidance and agreement on the methodology for the Flood Risk Assessment process.

Groundwater

- 13.5.5 An assessment of groundwater will be carried out to identify all abstractions and discharges that are susceptible to flow and quality impacts. Consultation with the local authority and NRW will be required to confirm these. The assessment will take into account the construction activities that are likely to affect groundwater and will identify whether they have potential to have an impact, using a “source – pathway – receptor” approach. The assessment will be used to identify any impacts and these will be mitigated through the CEMP. The CEMP will also provide control measures to minimise impact. Chapter 10, Land Quality, provides further information on consideration of groundwater contamination.

Surface Water

- 13.5.6 An assessment would be undertaken to assess potential impacts of accidental spillages on water quality in the receiving waterbodies. This assessment will also establish the requirements for mitigating measures, through the CEMP. The CEMP will also provide control measures to minimise impact.
- 13.5.7 The significance of effects will be determined by considering criteria relating to the value of the water environment receptor and the significance of the impact.

Additional Data Collection

- 13.5.10 In addition to the desk-based data collated to date, the baseline conditions will be identified using a review of available information including:
- Flood model data from NRW;
 - Drainage and flood data from Local Authority Surface Water Management Plans and Strategic Flood Risk Assessments;
 - Data defining surface water catchment areas and hydrological properties (e.g., rainfall, slopes, and soil permeability) from the Flood Estimation Handbook webservice;
 - NRW Flood Risk Data; and
 - WFD Cycle 3 data.

14 Socioeconomics

- 14.1.1 This section of the Scoping Report identifies potential impacts with regard to Socioeconomics that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.
- 14.1.2 In this context “social impacts” refer to the consequences to human populations of any actions that relate to ways in which people live, work, play and relate to each other.
- 14.1.3 The term “economic impacts” refers to issues such as employment, direct and indirect spending associated with the proposed development.

14.2 Introduction

- 14.2.1 The type of structure and location of the proposed development would suggest the following key stakeholders to be considered in the socio-economic assessment:
- Tourism - particularly camping and caravan sites;
 - Local recreation users – users of public rights of way (PRoW) in the area; and
 - Residents – particularly in Trefeglwys, Newchapel and Llanidloes, including impacts of construction traffic (see Chapter 4 for details of traffic assessment).
- 14.2.2 The study area, or zone of influence, for the assessment will vary according to the impact type and the stage of the proposed development being assessed. There are two geographical scales at which effects are reported. Lower Super Output Areas (LSOAs) are designed to improve the reporting of small area statistics and are the lowest geographical level at which census estimates are provided. Therefore, they will be used in the ES on the Scoping Report Corridor assessment. Table 14.1 presents the socio-economic study areas and the focus during construction and operation.

TABLE 14.1: SOCIO-ECONOMIC STUDY AREAS

Study Area	Baseline Measured By	Construction	Operation
Within 2km of the proposed development (based on professional judgement and designed to complement the visual assessment)	Lower Super Output Areas	✓	✓
The Local Authority Area	Powys Local Authority	✓	✗

14.3 Baseline

- 14.3.1 The Scoping Report Corridor is within the geographic boundary of Powys. There are 3 super-output areas that are within a substantial proportion of the route:
- W0100043 – Powys 006A
 - W01000429 – Powys 010A
 - W01000477 – Powys 012D
- 14.3.2 The Scoping Report Corridor at its most northern point is at the proposed Llyn Lort Energy Park. The Scoping Report Corridor then proceeds south towards Trefeglwys, then located to the east of Llanidloes until it reaches the proposed Rhiwlas Energy Park (Section 2). The remaining section from the proposed Rhiwlas Energy Park to the Banc Du Energy Park will be an underground cable.
- 14.3.3 Powys is a largely upland and rural county in the centre of Wales covering over 5,000 sq km (approximately a quarter of the land mass in Wales). The rural character of Powys is further illustrated by the nature of Powys’ towns, which by national standards, are comparatively small. The majority of the

population of Powys is located in towns and large villages. The largest town is Newtown which has a population of 11,357, followed by Ystradgynlais, Welshpool and Llandrindod Wells that have populations of 8,092, 6,664 and 5,309 respectively. Large villages typically have populations of between 200 and 600, whereas the Small Villages usually have populations of less than 300, with many being less than 10090.

- 14.3.4 Powys has a population density of approximately 26 persons per square kilometre. The average population density in Wales is approximately 150 persons per square kilometre. In Powys the population size has increased slightly (0.2%) from around 133,000 in 2011 to 133,200 in 2021. This is lower than the overall increase for Wales at 1.4%. There has been an increase of 22.3% in people aged 65 years and over in 2021 compared to 2011, a decrease of 5.8% in people aged 15 to 64 and a decrease of 9.3% in children aged under 15 years⁹¹.
- 14.3.5 Table 14.2 presents the population numbers for the Lower Super Output Areas and confirms that the areas are not densely populated.

TABLE 14.2: DATA AREA AND POPULATION NUMBERS [LOWER SUPER OUTPUT AREAS & COUNTY]⁹²

Potential Impact	To be assessed in EIA	All ages
Lower Super Output Areas		
Powys 010A	W01000429	2,318 persons
Powys 006A	W01000433	2,264 persons
Powys 012D	W01000477	1,498 persons
County level		
Powys		128,832 persons

- 14.3.6 In Powys approximately 77% of the population were economically active from October 2022 to September 2023 and unemployment is at 3.4% (compared to 3.8% in Wales). 18.3% of persons in Powys are retired compared to 13.1% in Wales. In Powys, 92.6% of businesses are micro businesses (0 to 9 employees) the Welsh average of micro businesses is 89.2%⁹³.
- 14.3.7 With its sparsely populated upland landscape and poor connectivity, Powys has very few large employers (i.e. businesses with 250+ employees) outside the public sector. Tourism is a key economic sector in Powys and further tourism development has the potential to support local communities and rural holdings both in economic and social terms. Agriculture, including intensive forms of, continues to be the largest primary production industry in Powys, mainly through small, family-run, upland farms. Much of the land is classified as being of very poor agricultural quality¹.

14.4 Receptors

- 14.4.1 The key potential receptors have been identified as follows:

- Residential properties;
- Businesses;
- Tourist accommodation;
- PRoW or areas of land with environmental and / or land designations (where they are used for recreational purposes);
- Tourist attractions (including festivals); and

⁹⁰ Powys County Council. (2018). Powys Local Development Plan 2011 – 2026. Available at: <https://powys.moderngov.co.uk/mgConvert2PDF.aspx?ID=26190>

⁹¹ Office for National Statistics. (2021). How the population changed in Powys: Census 2021. Available at: <https://www.ons.gov.uk/visualisations/censuspopulationchange/W06000023/>

⁹² Office for National Statistics. Lower Layer Super Output Area Population Estimates (supporting information) Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareamidyearpopulationestimates>

⁹³ Nomis.(2022/2023). Labour Market Profile. Powys. Available at: <https://www.nomisweb.co.uk/reports/lmp/la/1946157389/report.aspx>

- Community facilities (including health centre / GP surgeries, religious / faith buildings, schools, village halls and sports facilities).

14.4.2 There are no military installations or airports that could be affected by the proposed development.

14.5 Scoping of Impacts

14.5.1 Table 14.3 and Table 14.4 present a summary of the scoping. They identify which potential impacts, with respect to socio-economic will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

14.5.2 Construction of the underground sections of the route may cause disruption that could be potentially significant due to trenches and the delivery of construction materials required. Therefore, impacts in relation to the underground sections are not scoped out of the assessment at this stage.

TABLE 14.3: POTENTIAL SOCIO-ECONOMIC IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Residential properties	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Businesses	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Tourism accommodation	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Public Rights of Way	Yes	Suitability of diversion (if required) and disruption to users
Tourism attractions	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Community facilities / Schools	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Construction workers	No	The nature of the construction phase is likely to require specialist personnel, however where appropriate there will be the opportunity for local labour provision. It is not considered that construction employment will have a significant adverse effect (effects are more likely to be beneficial) and so this impact has been scoped out of the assessment.

TABLE 14.4: POTENTIAL SOCIO-ECONOMIC IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Residential properties	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Businesses	No	It is not considered that disruption to businesses would result in likely significant effects in the operation phase.
Tourism accommodation	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Public Rights of Way	No	Potential impacts on PRoW scoped out on basis that permanent diversions would not be required.
Tourism attractions	Yes	Potential for significant landscape, transport and / or noise disruption to local community.
Community facilities / Schools	No	It is not considered that disruption to community facilities or schools would result in likely significant effects in the operation phase.

Operational workers	No	There will be some employment during operation for maintenance purposes, but this will be minimal and sporadic. No permanent employment will be created as a result of the proposed development. It is not considered that operational employment will have a significant adverse effect (it is more likely to be beneficial) and so this impact has been scoped out of the assessment.
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14.6 Methodology for Impact Assessment

- 14.6.1 There is no specific guidance available that establishes a methodology for undertaking the socio-economic assessment within the EIA process. Accordingly, the approach adopted for this assessment is based on professional experience, best practice and in consideration of national and local planning policy. In addition, reference will be made to other key chapters such as landscape, transport and noise as appropriate to identify where there could be an impact on a socio-economic receptor.
- 14.6.2 The first step in the assessment is to identify the sensitivity of the receptors. In socio-economic assessments, receptors are not sensitive to changing environmental conditions in the same way as many environmental receptors are. To address this, the assessment draws on a combination of measurable indicators and a consideration of the importance of the receptor in policy terms to gauge the receptor's sensitivity. For example, the number of jobs in the area may increase during construction but will reduce during operation for this development type. This is considered alongside the weight attached to these issues in local policy. Table 14.5 shows the sensitivity criteria followed in this assessment.

TABLE 14.5: SENSITIVITY CRITERIA – SOCIO-ECONOMIC

Sensitivity	Evidence for Sensitivity Assessment
High	Evidence of direct and significant socio-economic challenges relating to a receptor. High priority mentioned in local, regional or national policy and legislation
Medium	Some evidence of socio-economic challenges linked to a receptor that may be indirect. Medium priority in local, regional or national policy.
Low	Little evidence of socio-economic challenges relating to receptor. Receptor is accorded a low priority in local, regional or national policy
Negligible	No socio-economic issues relating to receptor.

- 14.6.3 The magnitude of change upon each receptor will be determined by considering the predicted deviation from baseline conditions, both before and, if required, after mitigation. The criteria used for the assessment of magnitude of change, which can be either positive (beneficial) or negative (adverse) are shown in Table 14.6.

TABLE 14.6: MAGNITUDE OF CHANGE CRITERIA – SOCIO-ECONOMIC

Magnitude of Impact	Evidence for Sensitivity Assessment
Significant	Proposed Development would cause a large change to existing socio-economic conditions in terms of absolute and/or percentage change.
Moderate	Proposed Development would cause a moderate change to existing socio-economic conditions in terms of absolute or percentage change.
Minor	Proposed Development would cause a minor change to existing socio-economic conditions in terms of absolute and or percentage change.
Negligible	No discernible change in baseline socio-economic conditions.

- 14.6.4 In reporting the effects of significance resulting from the proposed development, at construction and operational stages, the assessment contextualises both the sensitivity of the receptor and the magnitude of change. The method uses the matrix shown in Table 14.7.

TABLE 14.7: SIGNIFICANCE MATRIX – SOCIO-ECONOMIC

Sensitivity of Receptor					
		High	Medium	Low	Negligible
Magnitude of Change	Significant	Major	Major	Moderate	Negligible
	Moderate	Major	Moderate	Moderate / Minor	Negligible
	Minor	Moderate	Moderate / Minor	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

- 14.6.5 Using this scale, effects identified as major or moderate are regarded as being significant. Effects of minor or lesser significance are regarded as not significant.
- 14.6.6 Apart from desk-top based data collection for the baseline survey there are no surveys proposed at this time for socio-economic studies.
- 14.6.7 Consultation is likely to be needed with Local Rights of Way Officers and if significant tourism attractions are identified within the area, then they will be contacted for visitor numbers.

15 Health and Wellbeing

15.1 Introduction

15.1.1 This section of the Scoping Report identifies potential impacts regarding Health and Wellbeing that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the Environmental Statement (ES).

15.2 Baseline

15.2.1 The Scoping Report Corridor is located in mid-Wales and extends from the Banc Du and Rhiwlas Energy Parks, which are located approximately 1.9 km from Llangurig, to the proposed Llyn Lort Energy Park. The proposed Llyn Lort Energy Park is located approximately 20-25km northeast of the Banc Du and Rhiwlas Energy Parks. The rural area is characterised by predominantly agricultural fields with interspersed settlements.

15.2.2 The proposed development is located in the administrative area of Powys County Council. Powys has the lowest population density in Wales, at 26 residents per square kilometre compared to the national average of 150 residents per square kilometre, as per the 2021 Census.

15.2.3 The proposed development extends across five wards:

- Llanidloes;
- Llanbrynmair;
- Caersws;
- Llanfair Caereinion and Llanerfyl; and
- Banwy, Llanfihangel and Llanwddyn.

15.2.4 Population estimates and health indicators for these wards are provided in Table 14.1 below.

15.2.5 In the five wards and the county of Powys, the percentage of the population aged 65 and over is significantly higher compared with the national average, while the population under 15, and the population aged 15-24 are lower than the national average⁹⁴. This indicates an ageing population, with declining birth rates in Powys and associated wards.

15.2.6 The percentage of people with 'bad' or 'very bad' health is lower in the five wards and the county of Powys compared to the national value of 7% in Wales⁹⁵.

TABLE 14.1: DATA FOR HEALTH INDICATORS

Local Health Indicators	Wards					County	Country
	Llanidloes	Llanbrynmair	Caersws	Llanfair Caereinion and Llanerfyl	Banwy, Llanfihangel and Llanwddyn	Powys	Wales
Population	4,200	1,800	2,300	2,100	2,200	133,200	3,107,500
Population aged under 15 (%)	15.5	12	13.7	14.4	12.6	14.4	16.5
Population aged 15-24 (%)	7.4	8.1	9	11	7.1	9.1	11.7

⁹⁴ Office for National Statistics. (2021). Population and household estimates, Wales: Census 2021. Available at: Population and household estimates, Wales: Census 2021 - Office for National Statistics (ons.gov.uk)

⁹⁵ Nomis. (2021). Powys Local Authority 2021 Census Area Profile. Available at: 2021 Census Profile for areas in England and Wales - Nomis (nomisweb.co.uk)

Population aged 65 and over (%)	28.7	31	28.8	26	30	27.8	21.3
General health-percentage of people with bad or very bad health	5.6	4.9	5.3	4.7	5.6	5.8	7

15.3 Scoping of Impacts

- 15.3.1 Table 14.2 and Table 14.3 present a summary of the scoping. They identify which likely environmental impacts, with respect to health and wellbeing will be assessed in the ES (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 14.2: POTENTIAL HEALTH AND WELLBEING IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Changes to health outcomes due to impacts on air quality during construction	No	Air Quality is proposed to be scoped out of the ES and therefore it is not considered likely that there would be significant effects as a result of the proposed development on air quality (including human health effects) during construction. Measures to ensure any potential impacts in relation to construction dust are not significant will be included in the CEMP. Therefore, it is deemed unlikely that there would be significant effects on human health and wellbeing as a result of air quality and it is therefore scoped out of further assessment.
Changes to health outcomes due to impacts on noise and vibration during construction	No	Chapter 6 Noise and Vibration will assess likely significant effects as a result of the proposed development on the noise environment, during construction. Measures to ensure any potential impacts in relation to construction noise are not significant will be included in the CEMP. It is deemed unlikely that there would be significant effects on human health as a result of noise and vibration and it is therefore scoped out for further assessment. Impacts in relation to disruption to the local community will be covered in Chapter 14 Socioeconomics.
Changes to health outcomes due to impacts on geology (in relation to contamination) during construction	No	Geology in relation to contamination during construction is proposed to be scoped out of the ES and therefore it is not considered likely that there would be significant effects as a result of the proposed development as a result of contamination (including human health effects). It is deemed unlikely that there would be significant effects in relation to human health and wellbeing as a result of changes to construction related contamination and it is therefore scoped out of further assessment.
Changes to health outcomes due to impacts on landscape amenity during construction	No	Chapter 8 Landscape and Visual will assess likely significant effects as a result of the proposed development on landscape amenity during construction. Impacts during construction would be temporary and would be minimised where possible to reduce visual impact within Chapter 8.

		Therefore, it is scoped out of further assessment within a separate health and wellbeing ES chapter. Impacts in relation to disruption to the local community will be covered in Chapter 14 Socioeconomics.
Changes to health outcomes due to impacts on water (in relation to contamination and flood risk) during construction	No	Chapter 13 Flood Risk, Hydrogeology and Hydrology will assess likely significant effects as a result of the proposed development on these topics, including potential impacts on human health. Impacts during construction would be temporary and measures to ensure any potential impacts in relation to contamination and human health are not significant will be included in the CEMP. Therefore, any likely significant effects would be addressed in Chapter 13 and therefore is scoped out of further assessment within a separate health and wellbeing ES chapter.
Changes to health outcomes due to impacts of Electromagnetic Fields (EMF) during construction	Yes	Likely significant effects (including those on human health) in relation to EMF will be assessed in a standalone EMF report and therefore is scoped out of further assessment within a separate health and wellbeing ES chapter.

TABLE 14.3: POTENTIAL HEALTH AND WELLBEING IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Changes to health outcomes due to impacts on air quality during operation	No	Air Quality is proposed to be scoped out of the ES and it is not considered likely that there would be significant effects as a result of the proposed development on air quality (including human health effects) during operation. Therefore, it is deemed unlikely that there would be significant impacts on human health and wellbeing as a result of air quality and it is therefore scoped out of further assessment.
Changes to health outcomes due to impacts on noise and vibration during operation	No	Chapter 6 Noise and Vibration will assess likely significant effects as a result of the proposed development on the noise environment, during construction and operation. Therefore, it is deemed unlikely that there would be significant impacts on human health as a result of noise and vibration and it is therefore scoped out for further assessment. Impacts in relation to disruption to the local community will be covered in Chapter 14 Socioeconomics.
Changes to health outcomes due to impacts on Geology in relation to contamination during operation	No	Geology in relation to contamination during operation is proposed to be scoped out of the ES and therefore it is not considered likely that there would be significant effects as a result of the proposed development as a result of contamination (including human health effects). It is deemed unlikely that there would be significant effects in relation to human health and wellbeing as a result of changes to operational contamination and it is therefore scoped out of further assessment.
Changes to health outcomes due to impacts on landscape amenity during operation	No	Chapter 8 Landscape and Visual will assess likely significant effects as a result of the proposed development on landscape amenity during operation. Therefore, landscape

		amenity is scoped out of further assessment within a separate health and wellbeing ES chapter. Impacts on landscape in relation to disruption to the local community will be covered in Chapter 14 Socioeconomics.
Changes to health outcomes due to impacts on water (in relation to contamination and flood risk) during operation	No	Chapter 13 Flood Risk, Hydrogeology and Hydrology will assess likely significant effects as a result of the proposed development on these topics, including potential impacts on human health. Therefore, any likely significant effects during operation would be addressed in Chapter 12 and therefore is scoped out of further assessment within a separate health and wellbeing ES chapter.
Changes to health outcomes due to impacts of EMF during operation	Yes	Likely significant effects (including those on human health) in relation to EMF will be assessed in a standalone EMF report and therefore is scoped out of further assessment within a separate health and wellbeing ES chapter.

- 15.3.2 Tables 14.2 and 14.3 determine that significant effects on health and wellbeing are not anticipated on most disciplines during construction or operation of the proposed development.
- 15.3.3 Where there is potential for likely significant effects, individual topic chapters and standalone reports will address these and a standalone health and wellbeing assessment chapter has been scoped out. This will be the case for Chapter 6 Noise and Vibration, Chapter 8 Landscape and Visual, Chapter 13 Flood Risk, Hydrogeology and Hydrology, and Chapter 17 EMF.

16 Climate Change

16.1 Introduction

- 16.1.1 This section of the Scoping Report identifies potential impacts regarding Climate Change that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the Environmental Statement (ES).
- 16.1.2 In accordance with the Environmental Impact Assessment (EIA) Regulations, the climate change chapter comprises of two assessments. The first assessment required involves the evaluation of the potential effects of the proposed development on the climate, which is referred to as a Greenhouse Gas (GHG) Impact Assessment. The second assessment, the Climate Change Resilience Assessment, investigates the effects of projected climate change on the proposed development and identified environmental receptors.
- 16.1.3 The Scoping Report shall determine whether a full climate assessment is necessary for the proposed development.

16.2 Methodology for Impact Assessment

Carbon Impact Assessment

- 16.2.1 As required by IEMA's latest guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022), the carbon impact assessment quantifies the carbon emissions associated with the proposed development.
- 16.2.2 The EIA Directive (2011/92/EU as amended by 2014/52/EU) requires a whole life carbon assessment, i.e., emissions from both the construction and operational phase of the proposed development are measured. In accordance with the modules contained within *PAS 2080:2023 (Carbon Management in Infrastructure)* (CLC, 2023) and standard industry best practice, the assessment boundary and sources of emissions that are considered within the GHG impact assessment include the pre-construction, construction and operation phases. Pre-construction and construction phases comprise the physical assets associated with the proposed development and are hereafter referred to as the embodied carbon of the proposed development. This includes emissions associated with sourcing of materials and construction activities and are defined in terms of lifecycle stages, detailed in RICS (2017), as follows:
- Products and materials (A1-3) – use of materials for temporary and permanent construction activities;
 - Transport to the Project site (A4) – the transportation of materials to the Project site, e.g., by heavy good vehicles (HGV); and
 - Construction and installation processes (A5) - construction plant use.
- 16.2.3 Emission sources also considered in the construction phase, beyond the system boundary of RICS (2017) include:
- Emissions from deforestation; and
 - Emissions from peatland disturbance or degradation.
- 16.2.4 The sources of emissions to be considered for the operational phase of the proposed development include the operational energy and water requirements of the proposed development. These elements are also defined in terms of life cycle stages, as detailed in RICS (2023), as:

- Operational energy use (B6); and
- Operational water use (B7).

Climate Change Resilience Assessment

- 16.2.4 The second assessment will comply with the requirements of the IEMA guide to Climate Change Resilience and Adaptation (IEMA, 2020). This qualitative risk assessment involves assessing the resilience of the proposed development and surrounding environment to climate change.
- 16.2.6 This assessment will consider the embedded and proposed measures of mitigation of all environmental technical disciplines, that are proposed to exist within the design, for the determination of resilience to climate change.

16.3 Baseline

- 16.3.1 As per IEMA guidance (IEMA, 2022), the baseline for the carbon impact assessment is taken as a 'business as usual' scenario, prior to existence of the proposed development. If the proposed development is located on a brownfield site, the current operations of the application site will be assessed as part of the baseline assessment. Where a baseline involves existing infrastructure, typical baseline carbon emission sources would include maintenance works (e.g., the embodied carbon of materials used), operational energy (e.g., lighting) and end-user emissions (i.e., emissions from vehicles using the road).
- 16.3.2 The study area for the assessment encompasses a wider extent than the proposed development site boundary due to the consideration of embodied carbon emissions from products and materials, the transport of materials to site and installation processes on site. The study area also includes activities that may be avoided or displaced because of the proposed development, namely construction and operational transport, heating, and electricity production activities. The baseline carbon emission sources thus comprise embodied carbon and operational utility consumption (electricity, gas, and water consumption).

Climate Change Resilience Assessment

- 16.3.3 The baseline for the Climate Change Resilience Assessment is based on the current climatic conditions, existing at the site and surrounding environment, as modelled via UKCP18 data (Met Office, 2023). The future baseline then describes the extent to which the identified receptors are vulnerable to and are affected by the projected changes to climatic impacts (e.g., temperature, precipitation, and wind), as relevant to the geographical location, characteristics, and timeframe of the proposed development. Future climatic projections are depicted based on the most applicable grid resolution of the UKCP18 projections, to the site location. This data will be provided to the EIA coordinators for dissemination around the environmental disciplines to ensure climate change projections are appropriately considered.

16.4 Receptors

Carbon Impact Assessment

- 16.4.1 For the Carbon Impact Assessment, the receptor is the global atmosphere.
- 16.4.2 The sensitivity of the receptor (global climate) to increases in carbon emissions is always defined as high as any additional carbon impacts could compromise the UK's ability to reduce its carbon emissions and therefore meet its future carbon budgets.

Climate Change Resilience

- 16.4.3 IEMA (2020) guidance defines the key potential receptors, for consideration within the assessment, as follows:

- Buildings and infrastructure receptors (e.g., equipment and building operations);
- Human health receptors (e.g., construction workers, occupants, and site users);
- Environmental receptors (e.g., habitats and species); and
- Climatic systems.

16.4.4 The combined impact on the UKCP18 projections of climate change on the receptors listed above, are assessed by each technical discipline that will be scoped into the ES. The receptors are qualitatively assessed against a range of climatic impacts (such as temperature, precipitation, and wind) and their respective change, as modelled by UKCP18 climate projections. Once the future baseline is established and the receptors are assessed for their resilience against the projected climatic changes.

16.5 Scoping of Impacts

16.5.1 Table 16.1 and Table 16.2 present a summary of the scoping assessment. They identify which likely environmental effects, with respect to climate change will be assessed in the EIA (e.g., considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (e.g., scoped out).

TABLE 16.1: POTENTIAL CLIMATE CHANGE IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Part 1: Carbon Impact Emissions arising from product stage, transport of materials to site and construction processes (A1 – A5 life cycle stage)	No	Emissions are expected to derive from the extraction of materials (A1 – A3), transportation of construction materials to the site (A4) and use of plant machinery on site for construction processes (A5). Regarding A1-A3 emissions, as it is proposed that the overhead line (OHL) is made of wooden poles, it is assumed that the structure will have significantly lower embodied carbon compared to other materials e.g., steel to timber embodied carbon factor ratio of nearly 10. Furthermore, timber has an emission benefit associated with biogenic carbon; the longer the biogenic carbon is stored in the timber, the greater the climatic benefit, as it reduces the time over which that carbon is in the form of a GHG contributing to global warming⁹⁶ The provisional sequence of construction activities includes preparation of accesses and felling of woodland (minimised wherever practicable), delivery of poles, excavation of foundations and erection of poles, and pole conductor 'stringing'. With delivery of poles being the relevant construction work for this emission category and assuming material origin is as local to the site as possible, the impact of transport emissions of material from manufacture to site (A4) will be negligible, particularly compared to the emission benefit of the proposed development, as it supports renewable electricity generation. Similarly, emissions arising from use of plant machinery on site for construction processes (A5) are assumed to not be of significance as

⁹⁶ Arup. 2023. Embodied carbon. *Buildings & Infrastructure Priority Actions for Sustainability*. Available at: ARUP-Embodied-carbon-timber-v2.pdf (istructe.org)

		an impact of climate change, particularly with the positive impact the proposed development will have on climate change, that being to support renewable energy generation.
Part 1: Carbon Impact Deforestation	No	Some woodland exists within the Scoping Report Corridor. However, the woodland may not be impacted by the proposed development depending on precise location of the OHL and underground cable. It is also stated within <i>Green GEN Cymru's Approach to Routeing Grid Infrastructure in Wales</i> that "many effects can be avoided or limited through careful routeing of new grid connections or siting of associated infrastructure such as substations. Where this is not possible, localised effects can be mitigated through deviations of the route, sections of underground cables, the refining of pylon or wood pole locations and/or specific construction practice". Furthermore, in the construction phase, potential felling of woodland will only occur where required but will be minimised wherever practicable. If deforestation of existing woodland within the Scoping Report Corridor occurred, it is argued that the impacts on project emissions are insignificant compared to the emission benefit associated with the proposed development, that being to support renewable energy generation.
Part 1: Carbon Impact Peat Disturbance	No	There is potential for significant emissions from peat disturbance but these will be considered in a stand-alone assessment and therefore will be scoped out of the climate chapter.

TABLE 16.2: POTENTIAL CLIMATE CHANGE IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Part 1: Carbon Impact Emissions from operation	No	It is expected that emissions from operation will be negligible, including maintenance, particularly as the proposed development will facilitate the transfer of renewable energy from the proposed Banc Du and Rhiwlas Energy Parks.
Part 1: Carbon Impact Emissions from End of Life	No	At this stage, it is anticipated that the operational lifespan of the proposed Rhiwlas and Banc Du Energy parks will be 40 years. However, it is possible the OHL may be re-equipped with new conductors, insulators and refurbished, rather than decommissioned. Emissions associated with replacement would be negligible, particularly against the benefit of the proposed scheme of supporting delivery of renewable electricity.
Part 2: Climate Resilience Changes in temperature, precipitation, storm frequency and sea level rise.	No	The scope of receptors considered in the assessment of climate resilience is minimal due to the rural, arable nature of existing landscape of the site, as well as the nature of the proposed development involving limited human and building receptors considered in this assessment, particularly during operation. Human receptors that will be more prevalent during the construction phase are omitted from assessment of sensitivity and therefore impact

		of climate change will not be significant to resilience of these receptors (e.g., construction workers, as climate change impacts will be negligible during the temporal scope of construction phase). Proposed climatic impacts existing within operation of the proposed development are modelled under the RCP8.5 50th percentile (Met Office, 2022). Regarding temperature, climate change projections estimate a 4 – 5 degree increase in mean temperatures. This increase in temperature, owing to climate change, could increase the sensitivity of receptors (in this case the structural elements of the proposed development) to withstanding climatic changes, however, as it is proposed that the OHL is made on wooden poles, it is assumed that the structure will not be significantly impacted from these climatic changes. Climate change may lead to periods of decreased precipitation resulting in water scarcity and periods of heavier rainfall leading to flooding. Regarding the impacts on groundwater and surface water from changing precipitation, this will be assessed in this chapter although it is assumed the current landscape is resilient to manage changes in precipitation (modelled between 0-10% increase/decrease depending on season). The proposed development is in an area not susceptible to coastal flood risk and thus is resilient to proposed change in sea level rise. The proposed development may be vulnerable to storm damage to structures and assets and consideration should be given to ensure structural resilience to wind and storm related risks. However, due to limited receptor exposed to this climatic risk, the overall impact of significance to the proposed development resilience is regarded not significant.
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- 16.5.2 Onshore wind development will play a critical role in assisting the Welsh Government to meet its renewable energy targets. The adversity of significance of the proposed development to climate change is deemed minor and therefore of insignificant impact, particularly compared to the significant positive impact associated with the purpose of the proposed development; to provide key infrastructure to enable future renewable energy generation to be connected into the National Electricity Transmissions System (NETS). Therefore, the climate change impact assessment is scoped out.
- 16.5.3 With regard to climate resilience, impacts of climatic effects to occur in the next 40 years are determined as insignificant based on the sensitivity of potential receptors, which are also limited due to site location and project type. For structural resilience, it is deemed insignificant that the proposed climatic impacts will be significant to the resilience of the structure based on type of structure and proposed material use of the proposed development.
- 16.5.4 Therefore, on the basis of Table 16.1 and Table 16.2, climate change is scoped out of the ES.

17 Electromagnetic Fields

17.1 Introduction

- 17.1.1 This section of the Scoping Report identifies potential impacts with regard to electromagnetic fields (EMF) that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.

17.2 Baseline

- 17.2.1 The assessment of baseline information has been informed by a desk-based search utilising OS mapping and OS data on residential dwellings/ industrial facilities.
- 17.2.2 The existing baseline EMF environment within and around the Scoping Report Corridor is likely to be characterised by natural field sources., e.g. the Earth's natural static magnetic field, being approximately 50 microtesla (μT) in the UK. Additionally, the atmospheric electric field at ground level is normally a few volts per metre (V m^{-1}) in dry weather, rising to higher numbers during thunderstorms.
- 17.2.3 No significant baseline sources of EMF are likely to be present within the Scoping Report Corridor, and baseline levels are hence considered to be negligible in most cases, certainly in the context of accepted EMF safety thresholds based on the methodology outlined below.
- 17.2.4 EMF levels are likely to remain similar to those currently present within the Scoping Report Corridor in the short term, with the exception of any other major developments that may affect these levels.

17.3 Receptors

- 17.3.1 The key potential receptors have been identified as follows:

- People in residential dwellings;
- Pedestrians;
- People in non-residential buildings; and
- Agricultural workers.

17.4 Scoping of Impacts

- 17.4.1 Table 17.1 and Table 17.2 present a summary of the scoping. They identify which likely environmental effects, with respect to electromagnetic fields will be assessed in the EIA (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 17.1: POTENTIAL EMF IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Electromagnetic fields from construction activities.	No	During construction and prior to energisation, the proposed development would not produce any discernible EMFs, as fields depend on the electrical currents flowing. Without energisation, no fields will be produced. Therefore, construction effects will be scoped out of the EMF assessment.

TABLE 17.2: POTENTIAL EMF IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
EMFs from operational and maintenance activities.	No (EMF's will be considered in a standalone technical report)	EMFs can cause adverse health effects in people. At low frequency, these adverse health effects include nerve stimulation, vertigo and magneto phosphene production. Energised high voltage power-transmission equipment, along with all other uses of electricity, is a

		source of EMFs. The proposed electrical transmission infrastructure will generate EMFs when in operation.
EMFs from operational and maintenance activities.	No (EMF's will be considered in a standalone technical report)	EMFs can interfere with a person's implanted medical device, such as a pacemaker or heart pump. Energised high voltage power-transmission equipment, along with all other uses of electricity, is a source of EMFs. The proposed electrical transmission infrastructure will generate EMFs when in operation.

- 17.4.2 Potential impacts of electromagnetic field exposure during the operational phase will be addressed in the form of a standalone technical report to be produced and submitted as part of the Development of National Significance (DNS) application. It is proposed that EMF's are scoped out of further consideration in the EIA on the basis that EMF levels are likely to remain similar to those currently present and significant effects are unlikely to occur.

17.5 Methodology for Impact Assessment

- 17.5.1 A standalone technical report on EMF will be prepared, based on the EMF assessment.
- 17.5.2 There are regulations in the UK related to the limitation of electromagnetic field exposure to workers in the UK, namely the Control of Electromagnetic Fields at Work Regulations 2016. For the protection of the public from EMF, this responsibility lies with the UK Government and associated bodies, e.g. the UK Health Security Agency (UKHSA) etc. In 1999, the Government adopted guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).
- 17.5.3 The EMF assessment will be carried out in line with relevant legislation, standards and guidance, notably:
- The International Commission on Non-Ionizing Radiation Protection Guidelines (ICNIRP) 1998;
 - The Control of Electromagnetic Fields at Work (CEMFAW) Regulations 2016;
 - The EU Council Recommendation 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields; and
 - The Department of Energy and Climate Change (DECC) Power Lines Code of Practice 2012.
- 17.5.4 The proposed approach will focus on the design of the proposed development to avoid or minimise potential effects where possible, and to aid the identification of further generic and site-specific measures as required.
- 17.5.5 Possible EMF field strengths will be calculated for a range of distances from the EMF sources (electrical conductors). EMF strengths at locations in proximity to these EMF sources will be evaluated against the ICNIRP guidelines and other relevant legislation/ guidance.

18 Major Accidents and Disasters

18.1 Introduction

- 18.1.1 This chapter of the scoping report identifies potential impacts with regard to major accidents and disasters that may occur during the construction and operation of the proposed development and outlines how these will be addressed in the ES.
- 18.1.2 The consideration of potential significant effects relating to the vulnerability of the proposed development to major accidents and disasters is required in regulation 4 (4) of the EIA Regulations .
- 18.1.3 A major accident is an event that threatens immediate or delayed serious environmental effects to human health, welfare and / or the environment, such as a major road accident. Major accidents can be caused by disasters resulting from both man-made and natural hazards. A disaster is a man-made / external hazard such as an act of terrorism or natural hazard such as an extreme weather event, with the potential to cause an event or situation that meets the definition of a major accident⁹⁷.
- 18.1.4 The assessment considers the vulnerability (exposure and resilience) to major accidents and / or disasters, the risk of accidents / disasters occurring and the implications for the likelihood of significant adverse effects on the environment.

18.2 Receptors

- 18.2.1 The key potential receptors have been identified as follows:

- Human health and welfare;
- The natural environment and biodiversity; and
- Built environment and infrastructure.

18.3 Scoping of Impacts

- 18.3.1 Table 18.1 and Table 18.2 present a summary of the scoping. They identify which likely environmental effects, with respect to Major Accidents and Disasters will be assessed in the EIA (i.e. considered to be likely significant effects and therefore scoped in) and those which will not be assessed further (i.e. scoped out).

TABLE 18.1: POTENTIAL MAJOR ACCIDENT AND DISASTER IMPACTS - CONSTRUCTION

Potential Impact	To be assessed in EIA	Reason
Major construction accidents	No	There is the potential for construction accidents on construction sites. However due to the nature and scale of the proposed development, it is expected that contractors will adhere to health and safety standards to mitigate risks where possible.
Wildlife	No	The Scoping Report Corridor is surrounded by areas of vegetation. During periods of extreme dry weather there is a risk of wildfire events. As a result of climate change impacts, the prevalence of wildfires is expected to increase. However, these events are considered to be low risk and local emergency services have good access to the area within the Scoping Report Corridor, further mitigating the risk. It is also expected that during construction a full fire evacuation plan would be prepared and agreed. Further assessment is scoped out of the ES.

⁹⁷ IEMA. (2020). Major Accidents and Disasters in EIA: A Primer. Available at: <https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer>

Major traffic accidents	No	The proposed development is not expected to result in significant additional trips on existing road networks during construction. The proposed development does not include the construction of access roads within the Scoping Report Corridor. The nature and scale of the proposed development is not such that major traffic accidents are made any more likely. Further assessment is scoped out of the ES.
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TABLE 18.2: POTENTIAL MAJOR ACCIDENT AND DISASTER IMPACTS - OPERATION

Potential Impact	To be assessed in EIA	Reason
Terrorism, malicious attacks and crowd disasters	No	The proposed development does not facilitate significant numbers of people in enclosed or bottleneck areas. The existing and proposed facilities are considered to be a low-risk target for terrorist and other malicious attacks or crowd related injuries (e.g. crushing or mass violence). This is a low-risk event and further assessment is scoped out of the ES.
Severe weather and flood events	No	Climate change adaptation and resilience has been considered within Chapter 16 Climate Change and has been scoped out of further assessment, either due to the absence of significant effects, or implementation of mitigation. Flood risk is addressed in scoping Chapter 13 (Flood Risk, Hydrogeology and Hydrology). Therefore it is not considered that severe weather is a significant risk to the proposed development and flood risk will be covered elsewhere, therefore has been scoped out of the assessment within a Major Accidents and Disasters chapter.
Wildfire	No	The Scoping Report Corridor is surrounded by areas of vegetation. During periods of extreme dry weather there is a risk of wildfire events. As a result of climate change impacts, the prevalence of wildfires is expected to increase. However, these events are considered to be low risk and local emergency services have good access to the area within the Scoping Report Corridor, further mitigating the risk. It is also expected that during design, and prior to operation a full fire evacuation plan would be prepared and agreed. Further assessment is scoped out of the ES.
Major traffic accidents	No	The proposed development is not expected to result in additional trips on existing road networks during operation. The nature and scale of the proposed development is not such that major traffic accidents are made any more likely. Further assessment is scoped out of the ES.

18.3.2 Therefore, it is considered that all potential impacts associated with Major Accidents and Disasters should be scoped out for both construction and operational stages.

19 Cumulative Effects

19.1 Introduction

19.1.1 This section of the Scoping Report identifies the potential for cumulative effects that may occur during the construction and operation of the proposed development and outlines whether these will be addressed further in the ES.

19.1.2 There are two forms of cumulative effects to be addressed:

- **Intra- cumulative effect:** where multiple different effects from the proposed development have the potential to result in a significant effect on a single receptor or group of receptors; and
- **Inter- cumulative effect:** where effects from several developments combine resulting in a potentially significant cumulative effect.

19.1.3 Where appropriate, individual technical chapters within the ES will provide detail on reasonably foreseeable inter-project cumulative effects with other development(s) within their Zone of Influence (Zoi). The ES will include a standalone Cumulative Effect Assessment (CEA) chapter to assess potential intra-project cumulative effects and summarise the findings of the technical chapters in terms of any significant residual effects.

Legislation and Guidance

19.1.4 Regulation 4(2) of the EIA Regulations requires that an EIA must identify, describe and assess direct and indirect significant effects of proposed development on the factors listed in (a) – (d), as well as the interaction between these factors.

19.1.5 Schedule 4 of the EIA Regulations (Schedule 4, Paragraph 5) require that the ES should consider the “direct effects and any indirect secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.”

19.1.6 The following guidance has informed the methodology for the assessment:

- European Commission (2017): Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU);
- European Commission (1999): Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions;
- Planning Inspectorate (2019): Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects;
- LA 104, Environmental assessment and monitoring, National Highways, August 2020;
- International Association for Impact Assessment (IAIA) Cumulative Effects Assessment Fast Tips (October 2017); and
- Institute of Environmental Management and Assessment (IEMA) (2020): Impact Assessment Outlook Journal -Demystifying Cumulative Effects (Volume 7, July 2020).

19.1.7 The IEMA Outlook Journal CEA review in particular acknowledges that “at present there is no single, agreed industry standard method [for CEA]”. The Welsh Government’s suite of DNS guidance (including specific guidance on EIA) does not include any specific provision for CEA. However, the Planning Inspectorate’s Advice Note Seventeen (Planning Inspectorate 2019)⁹⁸ provides valuable guidance on how to structure the CEA for major infrastructure projects and will be followed as part of the CEA for the proposed development.

⁹⁸ National Infrastructure Planning. Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects, published August 2019 (Version2).

19.2 Baseline

- 19.2.1 The baseline conditions will be defined in each of the individual environmental topics covered in Chapters 4-18. Where relevant, a 'future baseline' may need to be defined where the prevalent baseline conditions at the point of construction and / or operation may be subject to known or foreseeable changes, for example due to other developments being progressed that may affect the current baseline.

19.3 Receptors

- 19.3.1 Receptors will be carried over from those identified in the individual technical chapters of the ES. Those identified likely to be impacted resulting in significant cumulative effects will be reported in the CEA chapter.

19.4 Scoping of Impacts

- 19.4.1 A CEA is proposed to be scoped in the EIA and reported as a standalone chapter in the ES.

19.5 Methodology for Cumulative Effects Assessment

Intra-relationship

- 19.5.1 The CEA will consider the in-combination effects where receptors experience multiple potential effects, of greater than negligible significance, from a range of impacts, which might collectively become significant, or of greater significance. These will be considered using a matrix-based approach and set out within a stand-alone chapter within the ES. Where further significant effects are identified mitigation will need to be considered and residual effects reported.

Inter-relationship

- 19.5.2 The assessment will follow the guidance in Advice Note Seventeen: CEA relevant to nationally significant infrastructure projects.
- 19.5.3 Each technical discipline will assess the potential for likely significant effects on their technical discipline as a result of a cumulative effect with 'other developments' identified within a defined ZOI for that discipline. In accordance with the EIA Regulations, where significant effects are identified, the CEA ES chapter will describe proportionate measures to avoid, prevent, reduce or, if required and possible, offset adverse effects. The resulting residual effects will then be reported and summarised in the standalone CEA chapter.
- 19.5.4 Advice Note Seventeen sets out a staged approach for assessing potential cumulative effects with other developments:

Stage 1: Establish the long list

- 19.5.5 A long list of other developments will be based on the developments included in the traffic assessment, in consultation with the Local Planning Authority (LPA). This list is referred to as the 'Uncertainty Log' and includes other proposed developments in the area. Additional developments will be added where relevant based on consultation feedback and a Desk-based study.

Stage 2: Establishing the short list

- 19.5.6 Developments identified on the long list will be scoped in or out for further assessment following the approach detailed in advice note seventeen. Developments scoped in will include:
- Those within the ZOI
 - Those that meet the criteria of 'Tier 2' and above
 - The road improvement works associated with the proposed development
 - Additional recommended developments from the LPA that are within the ZOI

Stage 3: Information gathering

- 19.5.7 Includes gathering proposed design and location information, timings of construction, operation and decommissioning, and the potential likely impacts. Publicly available environmental assessments will also inform baseline data and residual effects arising from other developments.

Stage 4: Assessment

- 19.5.8 Assessment of both potential impacts on receptors identified in steps 1 to 3. The level of detail will be commensurate with the information available at the time of assessment. Where information is limited, such gaps would be acknowledged within the assessment. Methodology would be more quantitative than qualitative in these instances.
- 19.5.9 Each technical discipline will assess the potential for likely significant effects on their technical discipline as a result of a cumulative effect with 'other developments' identified in the ZoI for that discipline. In accordance with the EIA Regulations, where significant effects are identified, the CEA ES chapter will describe proportionate measures to avoid, prevent, reduce or, if required and possible, offset adverse effects. The resulting residual effects will then be reported and summarised in the standalone CEA chapter.

19.6 Climate Change Adaptation and Resilience

- 19.6.1 Climate change has the potential to increase the frequency and severity of environmental effects of the proposed development in the future (during both construction and operation).
- 19.6.2 For intra-related effects, individual topics will have considered potential effects of climate change in their assessment where appropriate and therefore, to avoid double counting, it is not considered necessary to include this in the standalone CEA chapter.
- 19.6.3 For inter-related effects, step 3 (information gathering) of the proposed methodology includes an understanding of timings of other developments. The CEA will consider adaptation and resilience for identified, reasonably foreseeable significant cumulative effects.

20 Conclusions

20.1 The Environmental Statement

20.1.1 The ES will address the requirements of Schedule 4 of the EIA Regulations. A preliminary structure and content of the ES is as follows:

- Non-Technical Summary
- Volume 1: Main Text:
 - Chapter 1 Introduction – introduction to the proposed development and ES structure and preparation
 - Chapter 2 Methodology – approach the EIA process and scope of the ES, scoping, details of consultation, overview of impact assessment methodology, outline of technical chapters, assumptions and limitations
 - Chapter 3 Application Site & Proposed Development – description of the application site, surroundings, the proposed development and construction information
 - Chapter 4 Alternatives & Design Evolution – a review of alternatives to the proposed development (location and design) and a summary of design interventions to eliminate or minimise potentially significant effects
 - Chapter 5 Transport and Access
 - Chapter 6 Noise and Vibration
 - Chapter 7 Ecology
 - Chapter 8 Landscape and Visual Impact
 - Chapter 9 Cultural Heritage and Archaeology
 - Chapter 10 Soils and Agriculture
 - Chapter 11 Flood Risk, Hydrogeology and Hydrology
 - Chapter 12 Climate Change
 - Chapter 13 Cumulative Effects
 - Chapter 14 Residual Effects and Conclusions
- Volume 2: Technical Appendices

20.1.2 Each of the technical chapters (4 to 14 above) will include the following sections (unless otherwise required by specific technical guidance):

- Introduction
- Methodology
- Baseline Conditions
- Design Interventions and Controls
- Potential Significant Effects
- Mitigation and Enhancement Measures
- Residual Significant Effects
- Summary and Conclusion

20.2 Conclusion

20.2.1 The scope of the above disciplines in terms of impacts to be taken forward into the ES has been described in chapters (4-19) of this report and will be subject to statutory consultation.

20.2.2 The topics listed below are not proposed to be covered by a technical assessment chapter within the ES:

- Air Quality
- Land Quality
- Material Assets and Waste
- Socioeconomics
- Health and Wellbeing
- Electromagnetic Fields

-
- Major Accidents and Disasters

Appendix A



Green GEN Rhiwlas Connection

Routeing &
Consultation
Document

November 2023

**GREEN
GEN
CYMRU**

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1 Introduction

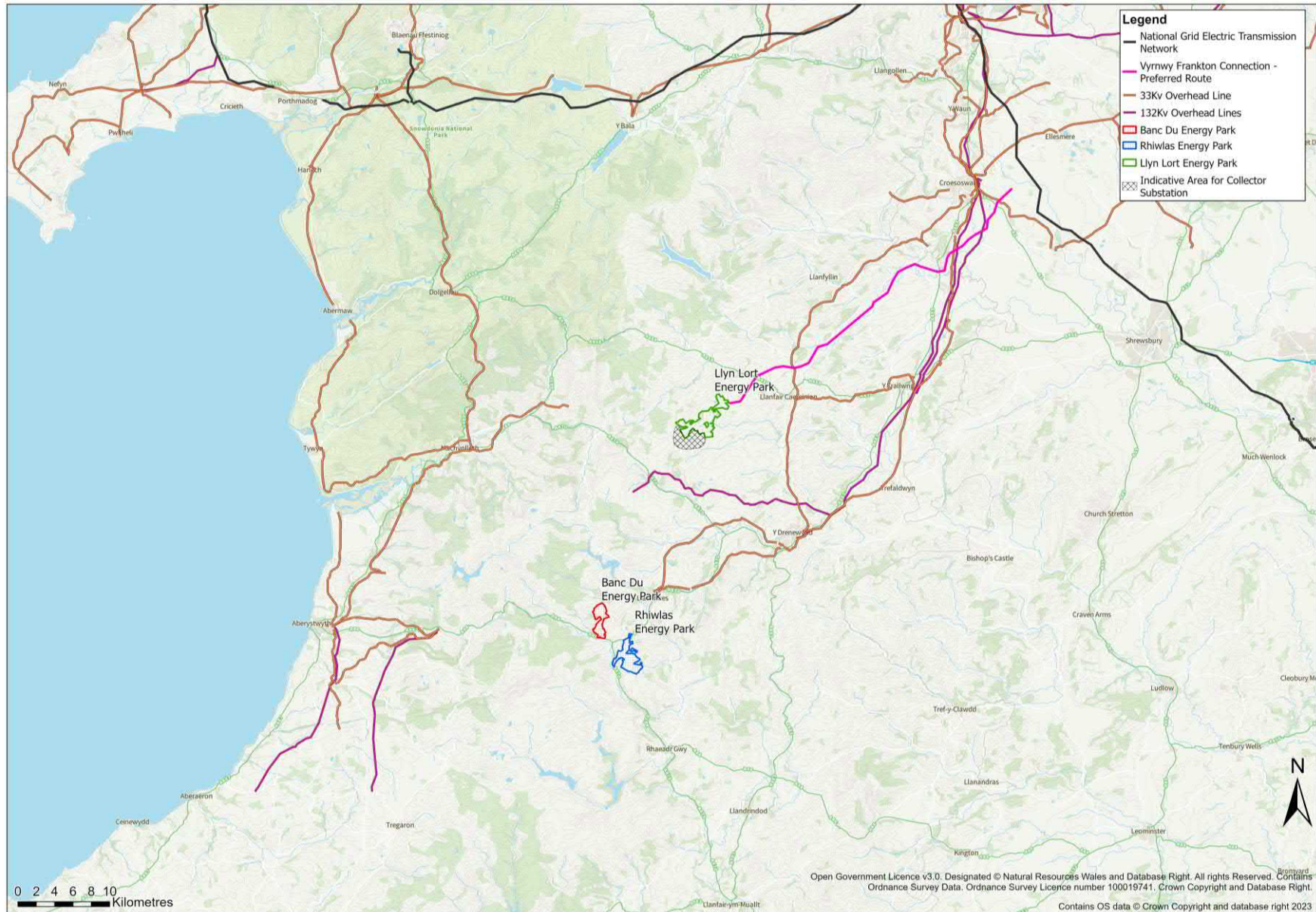
1.1 Purpose of the Report

- 1.1.1 This document has been prepared by Sweco on behalf of Green GEN Cymru to inform consultation on the routeing process and identification of the preferred route for the proposed **'Green GEN Rhiwlas Connection Project'**.
- 1.1.2 This report relates to the identification and appraisal of route options for a new 132 kilovolt (kV) overhead line (OHL) supported on a Single Circuit Wood Pole Line with average span lengths of 85m. The OHL will provide a connection between the Banc Du and Rhiwlas Energy Parks to a proposed new 132kVv collector substation which will collect the generation from Bute Energy's Mid-Wales Energy Parks. From there, a new 132kV double circuit line will take the power to the existing 400kV National Grid Electricity Transmission Network in Shropshire. The existing transmission network, Energy Parks and indicative area for the collector substation are shown in **Figure 1.1**.
- 1.1.3 The following sections of this document explain the background to the proposals and need case, the proposed development itself (Chapter 2) and the methodology adopted for the routeing study (Chapter 3) The purpose of this document is also to present the findings of the environmental baseline and evaluation of the route options, culminating in a description of the 'preferred route' for the connection (Chapter 4).
- 1.1.4 This document provides an opportunity for interested parties to comment on the preferred route and any other related issues which can inform the next stages of the project's development (Chapter 5).

1.2 The Need for the Project

- 1.2.1 In 2008, the Climate Change Act entered into force in UK law. Section 1 (amended in 2019 when the UK Government declared a climate emergency) requires the Secretary of State to ensure that the net UK carbon account for 2050 is at least 100% lower than the 1990 baseline. This is often referred to as the "net zero" target. It also requires the Secretary of State to set legally binding carbon budgets which apply for five year intervals from 2008 and (in theory), place a restriction on the total amount of greenhouse gases the UK can emit over those five-year periods. These carbon budgets are there to set a trajectory towards the net zero target by 2050.
- 1.2.2 The UK's sixth carbon budget, which relates to the period 2033-2037, was made in 2021. The UK Government's October 2021 Net Zero Strategy sets out its policies and proposals for decarbonising all sectors of the UK economy in order to meet its net zero target by 2050.
- 1.2.3 The Environment (Wales) Act 2016 also requires the Welsh Government to reduce greenhouse gas emissions (GGEs) in Wales to net zero for the year 2050, with a system of interim emissions targets and carbon budgets. In 2017, the Welsh Government set a target that at least 70% of Wales' electricity consumption would be met from renewable generation by 2030.
- 1.2.4 In April 2019, the Welsh Government also declared a climate emergency. As part of its plan to tackle this emergency, the Welsh Government has brought forward policies to encourage innovative ways of creating energy that are sustainable, secure and cost effective.
- 1.2.5 Onshore wind development will play a critical role in assisting the Welsh Government to meet its renewable targets. Central to this are the Pre-assessed Areas where 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. Future Wales confirms that "*there is a presumption in favour of large- scale wind energy development ... in these areas*". Outside of these areas, Future Wales confirms that a positive policy framework still exists.

Figure 1.1: Existing electricity transmission network, Energy Parks and indicative area for the collector substation

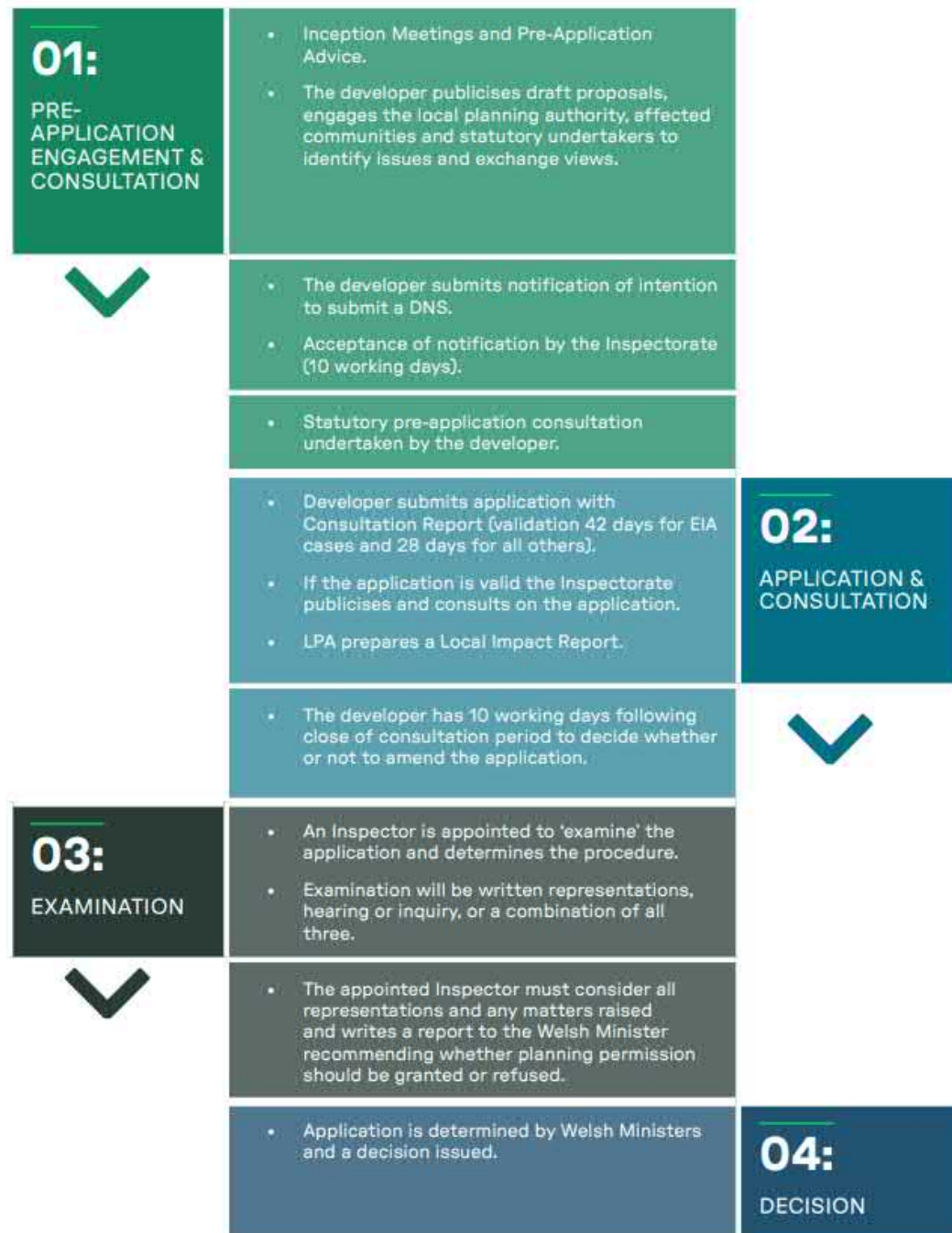


- 1.2.6 A key challenge to delivering Wales' net zero obligations is the lack of existing electricity network capacity in some of the best locations for onshore wind. Without intervention, this will hinder progress on achieving the UK Government and Welsh Government's net zero targets. Future Wales notes "*The Welsh Government acknowledges the significant challenge that grid infrastructure and capacity will have on the potential for new on-shore and off-shore renewable energy development across Wales*". There is therefore a clearly identified national need for new renewable energy development and associated grid infrastructure in Wales.
- 1.3 **Who are Green GEN Cymru?**
- 1.3.1 Green GEN Cymru is a business in the Bute Energy Group and its aim is to promote, consent and develop new grid infrastructure to distribute green energy in Wales. Green GEN Cymru is currently applying for an Independent Distribution Network Operator (IDNO) licence from Ofgem to allow them to construct, own, operate and maintain electricity networks.
- 1.3.2 Green GEN Cymru's approach aligns with Future Wales and the Welsh Government's ambitions for unlocking renewable energy generation in Wales. Green GEN Cymru will follow best practice in working with local communities throughout the development of its proposals, ensuring that communities have a strong voice in the process.
- 1.3.3 Green GEN Cymru will invest millions of pounds directly into Welsh communities closest to its projects. A Community Benefit Fund will be established that will be worth millions of pounds every year that will be spent in the local area to its projects.
- 1.3.4 Green GEN Cymru is also keen to work in partnership with the Welsh Government, Local Authorities and the private sector to explore how others can use its infrastructure to the benefit of local communities in Wales.
- 1.4 **Who are Bute Energy?**
- 1.4.1 Bute Energy is set to become a leading developer of onshore renewable energy in the UK. It was established to help address the climate crisis by providing low cost, reliable power. The mission is to help unlock Wales' potential for onshore renewable power generation and bring benefits to local communities where energy parks are created. Bute Energy's aim is to be forward- thinking in everything it does, and it is passionate about finding better ways to deliver renewable energy using reliable and proven technology.
- 1.4.2 Bute Energy is seeking to deliver a package of sustainable benefits and clean energy initiatives. Headquartered in and focused on Wales, the aim is to deliver a portfolio of new energy parks, using the proven technology to deliver onshore renewable power generation in Wales.
- 1.5 **The Development and Consenting Process**
- 1.5.1 This document reports on the routeing stage of the Green GEN Rhiwlas Connection Project. It follows the approach as described in the 'Green GEN Cymru 'Approach to Routeing Grid Infrastructure in Wales' guidance document¹ which has been adapted for the Study Area for this project. The routeing process is iterative in nature with the output of each stage informing the subsequent stages. Feedback received from consultation and/or technical review can also result in earlier stages being repeated as necessary in an iterative manner. Chapter 5 of this document sets out the approach to consultation in further detail.
- The Developments of National Significance (DNS) Consenting Regime***
- 1.5.2 The Green GEN Rhiwlas Connection Project will be a 'Development of National Significance' (DNS) as set out in the Planning (Wales) Act 2015. DNS are infrastructure development projects of national importance which are decided by the Welsh Ministers. The DNS consenting process is

¹ <https://greengentowyusk.com/documents/Approach%20to%20routeing%20Grid%20infrastructure%20in%20Wales.pdf>

specific to Wales and includes bespoke requirements for pre-application consultation to take place later in the connection project development process (see Chapter 5). The stages of the DNS application are shown in **Figure 1.2** below.

Figure 1.2: Stages of the DNS Application process



Welsh Renewable Energy and Climate Change Policy Future Wales: The National Plan 2040 (February 2021)

- 1.5.3 Future Wales is the Welsh Government's National Development Framework and is the highest tier of the Development Plan in Wales. Applications for DNS must be determined in accordance with Future Wales.

1.5.4 Future Wales has primacy in the planning policy hierarchy, ensuring that planning decisions are consistent and support the delivery of Welsh Government strategic aims and policies (including those in Planning Policy Wales, the Wales Infrastructure Investment Plan and Regional Economic Frameworks). Future Wales has particular regard to the following Welsh Government policy and legislation:

- Planning Policy Wales (Edition 11 February 2021);
- Well-being of Future Generations (Wales) Act 2015;
- Environment (Wales) Act 2016;
- Prosperity for All: A Low Carbon Wales (March 2019); and
- Policy Statement: Local ownership of energy generation in Wales – benefitting Wales today and for future generations (February 2020).

1.5.5 Future Wales provides the spatial direction for development in Wales and the policy framework for Strategic and Local Development Plans. These plans are required to conform to Future Wales and planning decisions at every level must be taken in accordance with the Development Plan.

Planning Policy Wales (edition 11) (February 2021)

1.5.6 In February 2021 the Welsh Government published Planning Policy Wales Edition 11 (PPW), which provides the key principles for the planning system in Wales, in terms of what development plans and decisions must achieve and how development should deliver the best possible outcomes. PPW is a material consideration in the planning process.

1.5.7 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, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation.

1.5.8 Section 5.7 of PPW details the policy in relation to the electricity grid network and that a positive approach to grid infrastructure should be taken to support low carbon emissions. The proposals of Green GEN Cymru and Bute Energy would make a significant contribution to these ambitions by both unlocking and delivering the renewable energy potential in areas that are not currently serviced by sufficient grid infrastructure.

Powys County Council Adopted Local Development Plan (2011-2026) (April 2018).

1.5.9 This document focuses on the Council's visions, objectives, policies and proposals for the sustainable development/ use of land in Powys during this time period. Policy RE1 within the development plan focuses on renewable energy. This policy supports the delivery of national policy and encourages renewable, low and zero carbon energy projects (and their associated infrastructure).

1.6 Structure of the Report

1.6.1 This Routeing and Consultation Document is structured as follows:

- Chapter 2 introduces the project.
- Chapter 3 describes the overall methodological principles applied to the routeing stage.
- Chapter 4 describes the method used to identify and appraise corridor options. It also details the outcome of the route option appraisal process and describes the preferred route.
- Chapter 5 sets out the proposals for the consultation on the preferred route.

- Chapter 6 describes next steps in the Environmental Impact Assessment (EIA) process.

1.7 **Project Team**

1.7.1 This report has been prepared for Green GEN Cymru by Sweco with specialist input from:

- Carter Jonas on Routeing and the Consenting Process
- Gillespie's on specialist landscape routeing input
- Bowland Ecology on Terrestrial Ecology and Nature Conservation and Ornithology
- Archaeology Wales on Cultural Heritage and Archaeology

2 The Proposed Grid Connection

2.1 Points of Connection

- 2.1.1 The Green GEN Rhiwlas Connection Project will commence at the Banc Du Energy Park. An underground cable of approximately 3km will then link directly to the Rhiwlas Energy Park, where the proposed new 132kV OHL will commence, linking to a proposed Collector Substation adjacent to the proposed Lynn Lort Energy Park, .
- 2.1.2 Banc Du and Rhiwlas Energy Parks are located approximately 1.9km from Llangurig with Banc Du to the north and Rhiwlas to the south-east The Lynn Lort Energy Park is located approximately 20-25km northeast of Banc Du and Rhiwlas Energy Parks. A preferred search area location for the proposed collector substation has been identified near Rhyd-y-Biswal, approximately 4.5km east-southeast of Cefn Coch. The collector substation, energy parks and the potential OHL routes between them are located within the Powys County Council Local Authority area, in the Montgomeryshire Assembly Constituency.
- 2.1.3 Rhiwlas Energy Parks will consist of up to 15 turbines with maximum blade tip heights of 200m, together with associated ancillary development including a control building and electrical substation. A Battery Energy Storage System (BESS) may also be included as part of the proposed development or considered at a later stage, subject to further technical studies. Further details of the Energy Parks are available on the Bute Energy website (<https://bute.energy/our-portfolio/>).
- 2.1.4 The Collector Substation and the 132kV connection to the National Electricity Transmission System (NETS) in England will form part of an application by Green GEN Cymru for a Development Consent Order. This separate project is known as the Vyrnwy Frankton Connection project. The Collector Substation is not therefore considered further in this document which instead focuses on the routing of the OHL from the collector substation to Rhiwlas Energy park. Further details on the Vyrnwy Frankton Connection project including the preferred collector substation search area near Rhyd-y-Biswal, Cefn Coch are available on the Green GEN Cymru project website: <https://greengenvyrnwyfrankton.com/en/the-project/our-proposals/>

2.2 New 132kV Overhead Line Infrastructure

- 2.2.1 The new 132kV OHL will comprise approximately 35km of 132kV single circuit double wood poles between Rhiwlas Energy Park and the Collector Substation.

Wood Poles

- 2.2.2 Wood poles are fabricated from pressure impregnated softwood, treated with a preservative to prevent damage to structure integrity. New wood poles are dark brown in colour and weather over the year to a light grey.
- 2.2.3 Double (also known as 'H') poles are proposed to be used for the new connection. Three types of wood pole will be required.
- **Intermediate:** where the pole forms part of a straight-line section
 - **Angle:** where the overhead line (OHL) requires a change of direction. All angle structures will require to be back stayed.
 - **Terminal:** where the OHL terminates into the substation or onto the underground cable via a cable sealing end.
- 2.2.4 Maximum allowable angle deviations of up to 75° are permitted on 'H' pole line, subject to specific limitations. An intermediate support pole, and 'H' pole are shown in **Figure 2.1** and **Figure 2.2**, below.

Figure 2.1: Typical intermediate 'H' pole



Figure 2.2: Typical back stayed angled 'H' pole where the OHL changes direction



Pole Heights and Span Lengths

- 2.2.5 The standard wood pole height is 15m (including steelwork and insulators), and individual pole heights are determined however to meet statutory clearance requirements. Pole height may be required to be increased where circumstances dictate, e.g., road and railway crossings, over elevated land, structures, or features. Pole sizes may also be slightly reduced where there are short spans or localised topography. As a consequence, the heights of the poles (above ground to the top of the insulators mounted on the poles), typically range from 10 to 22m with an average height of 15m.
- 2.2.6 The average span length between wood poles is approximately 85m, although the length of individual spans can vary to suit localised conditions, depending on route alignment needs, landform / topography, existing infrastructure and environmental constraints, ownership boundaries conditions and the like. Typically, a maximum possible span would be 120 -140m.

Overhead Line Components

- 2.2.7 The line will carry one 3-phase circuit, which means that the poles will support three conductors. Each conductor is made of aluminium alloy, with a nominal diameter of 22 - 25mm².
- 2.2.8 Insulators attached to the pole cross arms support the conductors and prevent the electric current from crossing to the pole body. The insulators are likely to be made from a polymeric compound (grey plastic). The steelwork and insulators are between approximately 10 - 22m in height.

2.3 Ancillary Development

- 2.3.1 In addition to the proposed wooden poles supporting the OHL conductors, ancillary development will be required to facilitate the construction of the OHL. Ancillary development will include construction working areas around individual poles, temporary access tracks, watercourse crossings, winching/pulling areas and construction compounds/laydown areas. This ancillary development will be temporary and will be removed and the ground re-instated following completion of construction of the OHL.

2.4 Construction Works

- 2.4.1 The construction of the new 132kV OHL, will follow a well-established sequence of activities as outlined below.
- Preparation of accesses and felling of woodland (where required but this will be minimised wherever practicable);
 - Delivery of pole, excavation of foundations and erection of poles;
 - Pole conductor 'stringing' and commissioning of the OHL; and
 - Removal of temporary infrastructure and reinstatement. The construction of OHLs can sometimes require temporary infrastructure such as temporary accesses to pole locations. All have minimal / no maintenance requirements and will be subject to recognised procedures for dismantling/ decommissioning.

2.5 Access

- 2.5.1 Prior to construction of the OHL, temporary accesses will be constructed, as needed, and laydown/ storage areas set up, usually mid-way along the route. The use of existing tracks and watercourse crossings will be maximised, with the upgrading of these if needed.
- 2.5.2 The use of low ground pressure and plant when taking temporary access is preferred. If access is required to be taken through sensitive areas, identified during the EIA process, other less intrusive methods can be applied such as temporary steel matting, or timber roadways.

- 2.5.3 Any trees which may have an impact on safety clearances will be removed or lopped. Safety clearances, in the context of overhead lines and electrical installations, refer to the minimum distances that must be maintained between energized conductors, with other objects or people. Safety clearances help prevent accidental contact with live electrical components, which could result in electric shock, electrocution, or fires.
- 2.5.4 Following commissioning of the OHL, all equipment and temporary access of construction areas will be removed, with the land being reinstated to its prior condition in agreement with the relevant landowner(s).

Temporary Working

- 2.5.5 Temporary working areas will be required for the duration of construction works. There is a requirement for temporary vehicular access to every pole location as well.
- 2.5.6 'H' Pole locations have a working area of approximately 15m x 15m for intermediate poles and 30 x 30m for angle/terminal poles. In certain circumstances, the shape/ size of the working area is controlled by the environmental/ land-use constraints that are located nearby.
- 2.5.7 The temporary working areas will be returned and restored to former conditions following the completion of the construction works.

Operation and Maintenance

- 2.5.8 Most OHL components require minimal maintenance. The exposed elements which suffer from corrosion, wear, deterioration and fatigue, will require inspection and periodic maintenance over the lifespan of the OHL. OHL cables generally require refurbishment after approximately 40 years.
- 2.5.9 Any felled easement areas will also be managed to maintain the required clearances whilst the connection remains active. These measures will ensure that the necessary safety clearances are maintained to guarantee the safety and functionality of the active utility connections. Walkover surveys or flyovers will identify where there is requirement to clear wayleaves of new growth.

Decommissioning

- 2.5.10 When the operational life of the proposed Green GEN Rhiwlas Connection Project ends, it is possible the OHL may be re-equipped with new conductors, insulators and refurbished. However, the OHL may also be decommissioned fully. At this stage, it is anticipated that the operational lifespan of the Rhiwlas and Banc Du Energy parks will be 40 years. There may be potential to extend the operational life of the energy parks or replace the turbines and electricity infrastructure, which would be subject to new planning consent(s) in the future. The need for the Rhiwlas Connection Project is therefore linked to the operational lifespans of the energy parks.

3 Approach to Routeing

3.1 Introduction

- 3.1.1 This Chapter provides an overview of the approach that Sweco has undertaken to the routeing stage for the Green GEN Rhiwlas Connection Project. As detailed in Chapter 1, this follows the review of the project needs case and identification and appraisal of potential connection options reported on within the Phase Two Grid Connection Strategy.
- 3.1.2 The routeing process is iterative in nature and a diagram showing this routeing process is set out in **Figure 3.1** below.

3.2 Routeing Methodology

Overarching Approach to Routeing

- 3.2.1 Several environmental and technical constraints and effects are taken account during the routeing process and the overall approach to routeing is based on the Green GEN Cymru's Approach to Routeing Grid Infrastructure in Wales².

"In compliance with the legal duties imposed on all licence holders under the Electricity Act 1989, all proposed grid connections must be 'efficient, coordinated and economical'. In economic terms, this is considered to comprise a route being as direct as possible after considering technical and environmental conditions.

In addition, proposed grid developments should seek to preserve features of natural and cultural heritage interest, and to mitigate where possible, environmental effects. Many effects can be avoided or limited through careful routeing of new grid connections or siting of associated infrastructure such as substations. Where this is not possible, localised effects can be mitigated through deviations of the route, sections of underground cables, the refining of pylon or wood pole locations and/or specific construction practice".

- 3.2.2 Careful routeing is the primary way to avoid key impacts and environmental and technical constraints and effects need to be considered and balanced.
- 3.2.3 The overall approach to routeing taken by Green GEN Cymru is based on the acknowledgement that the main effects of OHLs are visual, due particularly to the scale of OHL towers relative to surrounding features within the landscape. As visual effects of OHLs cannot always be mitigated (for example via screening), careful routeing is the primary way in which visual effects may be reduced. Other environmental and technical constraints and effects need to be considered alongside, and balanced with, visual effects.
- ### 3.3 The Holford Rules
- 3.3.1 The approach for routeing an OHL is one of 'funnelling' from the strategic to the specific using the Holford Rules, incorporating consideration of other factors appropriate to the stage of the project and with input from technical stakeholders and the public as appropriate.
- 3.3.2 Broad principles for overhead transmission line routeing specifically, were formulated by the late Lord Holford in 1959. These rules, known as the 'Holford Rules' are regarded as industry standards and have been tested at public inquiries and at hearings under the Electricity Act 1989.
- 3.3.3 The Holford Rules recognise that the most likely effects of an overhead line are visual and that the degree of visual intrusion can be reduced by careful routeing, for example by utilising landform and trees to provide screening and backgrounding and by seeking to retain an appropriate distance from settlements and viewpoints. The Rules also recognise that routeing

² <https://greengentowyusk.com/documents/Approach%20to%20routeing%20Grid%20infrastructure%20in%20Wales.pdf>

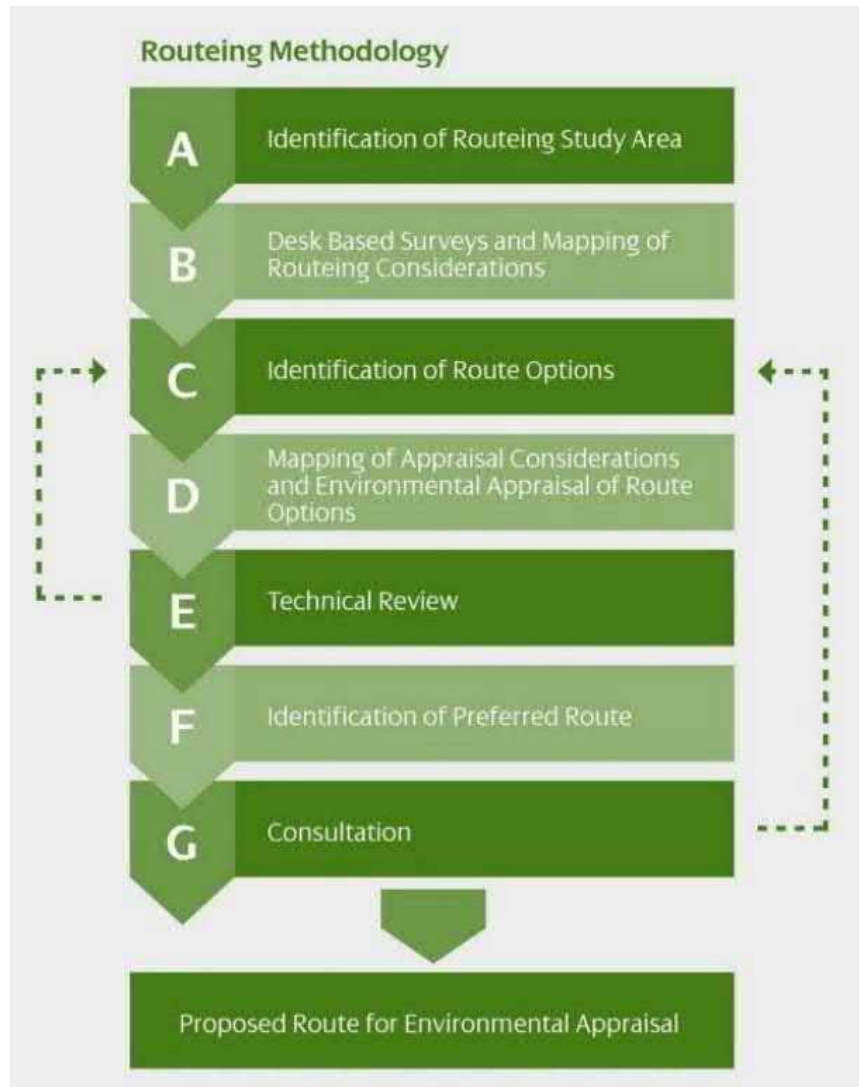
should take account of other environmental considerations by seeking to avoid the most sensitive and valued natural and manmade features. In summary:

- **Rule 1:** Avoid altogether, if possible, the major areas of highest amenity value, by so planning the route of the line in the first place, even if the total mileage is somewhat increased in consequence.
- **Rule 2:** Avoid smaller areas of high amenity value, or scientific interest by deviation; provided that this can be done without using too many angle towers, i.e., the more massive structures that are used when lines change direction.
- **Rule 3:** Other things being equal, choose the most direct line, with no sharp changes of direction and thus fewer angle pylons.
- **Rule 4:** Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and when the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where it does not, cross directly, preferably between belts of trees.
- **Rule 5:** Prefer moderately open valleys with woods where the apparent height of the towers will be reduced, and views of the line will be broken by trees.
- **Rule 6:** In country which is flat and sparsely planted, keep the high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables so as to avoid a concentration or wirescape.
- **Rule 7:** Approach urban areas through industrial zones where they exist (noting that where a line needs to pass through a development area, it should be routed to minimise as far as possible the effect on development and that alignments should be chosen after consideration of the effects on the amenity of existing development and on proposals for new development).
 - **Supplementary Note A** - Avoid routeing close to residential areas as far as possible on grounds of general amenity.
 - **Supplementary Note B** - Where possible choose routes which minimise the effect on Special Landscape Areas, Areas of Great Landscape and other similar designations of County, district, or local value
 - **Supplementary Note C** -In addition to adopting appropriate routeing, evaluate where appropriate the use of alternative tower designs where these would be advantageous visually, and where the extra cost can be justified.

- 3.3.4 The Holford Rules provide a consistent framework and strategy for routeing decisions but also constitute design guidelines that still require the application of weighting and professional judgement to resolve where conflicts which may arise with technical design or other environmental considerations come into play.
- 3.3.5 The routeing process can therefore be represented in a simplified form as linear (see steps A to G in **Figure 3.1**) with the findings of each step informing the next step as the routeing design is progressively refined based on increasingly detailed assessment. However, in practice the process is iterative, due particularly to the consideration of the results of consultation at various individual steps. The iterative approach enables the validity of previously applied assumptions to be confirmed and ensures confidence in the findings of individual steps in the routeing process before subsequent steps begin.
- 3.3.6 The routeing process for the Green GEN Rhiwlas Connection Project is divided into consideration of corridors and consideration of route options. An overview of the steps involved is provided below and shown in **Figure 3.1**. Application of the routeing methodology, including the findings

are set out in the following sections of Chapter 3 and culminating in the confirmation of the preferred route in Chapter 4.

Figure 3.1: OHL Routeing Process.



3.4 Environmental Considerations

3.4.1 Statutory duties imposed by Section 38 and Schedule 9 of the Electricity Act 1989 require licence holders to seek to preserve features of natural and cultural heritage interest, and to mitigate where possible, any effects which their proposals may have on such features. The construction and operation of an OHL will have potential effects on people and the environment, including potential effects on (in no hierarchical order):

- visual amenity.
- landscape character.
- cultural heritage including archaeology.
- ecology and ornithology.
- hydrology, hydrogeology, geology and water resources.
- land uses including mineral operations, agriculture and forestry.

- recreation and tourism.

3.4.2 Some effects can be avoided or limited through careful routeing. Other effects are best mitigated through local deviations of the route, the refining of the pole locations and/or specific construction practices. These are reviewed as part of the ongoing design and EIA process.

3.4.3 There are other topics such as carbon, materials, traffic and transport (access), noise and air quality that would be considered in more detail during the EIA stage of the development and consenting process (if required based upon the selected preferred route location). Specialists in these areas have been consulted with at this stage to ensure there are no issues that could impact the progression of the project.

3.5 **Technical Considerations**

3.5.1 Technical considerations which can influence routeing include the existing electricity transmission and distribution networks, existing transport infrastructure such as railways, access requirements/opportunities, commercial operations such as quarries, Ministry of Defence (MoD) safeguarding areas, slope gradient, altitude, waterbodies and existing and proposed wind farms. It is important that these technical considerations are considered at the early stages of routeing to ensure that the preferred route is buildable.

3.6 **Economic Considerations**

3.6.1 Section 9 of the Electricity Act 1989, states that 'It shall be the duty of an electricity distributor...to develop and maintain an efficient, co-ordinated and economical system of electricity distribution...' This duty has been interpreted by Green GEN Cymru to mean that, as far as is reasonably practicable, and all other concerns being equal, the proposed OHL should be as direct as possible, and the route should avoid areas which would render the scheme unviable on economic grounds.

3.7 **Identification and Appraisal of Corridors**

3.7.1 For OHL connections, a route 'corridor' is identified that will contain several candidate route options. Selection of the corridor is initially preceded by identification of a study area (Step A) of a sufficient size to contain relevant alternative corridor options. Following mapping of environmental and technical considerations (Step B), a landscape led approach is taken to identify corridor options within the study area (Step C). From which the preferred corridor is selected via appraisal of the corridor options against environmental and technical considerations referenced above, applying the Holford Rules as appropriate (Step D). The data used for this appraisal and the detail of the analysis is necessarily proportionate to the appraisal's strategic scale.

3.7.2 This approach has been followed for the Green GEN Cymru Connection supported with digital interactive mapping, site visits and technical workshops to discuss and identify all potential constraints and opportunities. After Step D, a 'Pole Spotting' exercise, has also been undertaken and further details are provided in Chapter 4.

3.8 **Identification and Appraisal of Route Options**

3.8.1 Following confirmation of the preferred corridor (Step D), the identification and appraisal of route options (Steps F and G) essentially follows the same process as the identification and appraisal of corridors, with the data used (Step E) and detail of the analysis for this step being proportionate to the more narrowly defined spatial range of the appraisal. Route options have a defined width of 200m to allow scope for further refinement of routeing and OHL component locations (such as towers) within the route option width during subsequent stages of the development process.

3.8.2 The appraisal of route options includes balancing of the environmental considerations, with this resulting in identification of an 'emerging preferred route'. A technical review of the 'emerging preferred route' is then undertaken, which may result in further modifications to the emerging

preferred route. This process ends with confirmation of the preferred route for the purposes of consultation.

3.9 **Review of Preferred Route Post-Consultation and Confirmation of Proposed Route**

- 3.9.1 Following consultation with stakeholders, including landowners and the community, and a review of consultation responses, the preferred route may be refined further to take account of feedback. This process results in confirmation of a proposed route for the purposes of progression to EIA Scoping. Further public consultation on a detailed route alignment for the project, including proposed tower locations, access routes and working areas will also take place during the EIA development stage, as discussed further in Chapter 6 below.

4 Corridor Identification and Selection

4.1 Introduction

4.1.1 A strategic routeing exercise was undertaken resulting in the identification of a search area between the Banc Du and Rhiwlas Energy Parks and an indicative area within which the Collector Substation could be located to the south of the Lynn Lort Energy Park, all located within Powys. This strategic routeing exercise also involved identifying potential corridor options within the initial search area. These corridor options were then appraised relative to each other to identify the preferred corridor.

4.1.2 The selection of the preferred corridor consisted of a number of steps as set out in **Figure 3.1** in Chapter 3 and in more detail in paragraphs 3.7.1 and 3.7.2. The following steps were taken:

- Step A: Identification of Study Area.
- Step B: GIS Mapping of Routeing Considerations.
- Step C: Identification of Corridors.
- Step D: Appraisal of Corridors.

4.2 Step A: Identification of Study Area

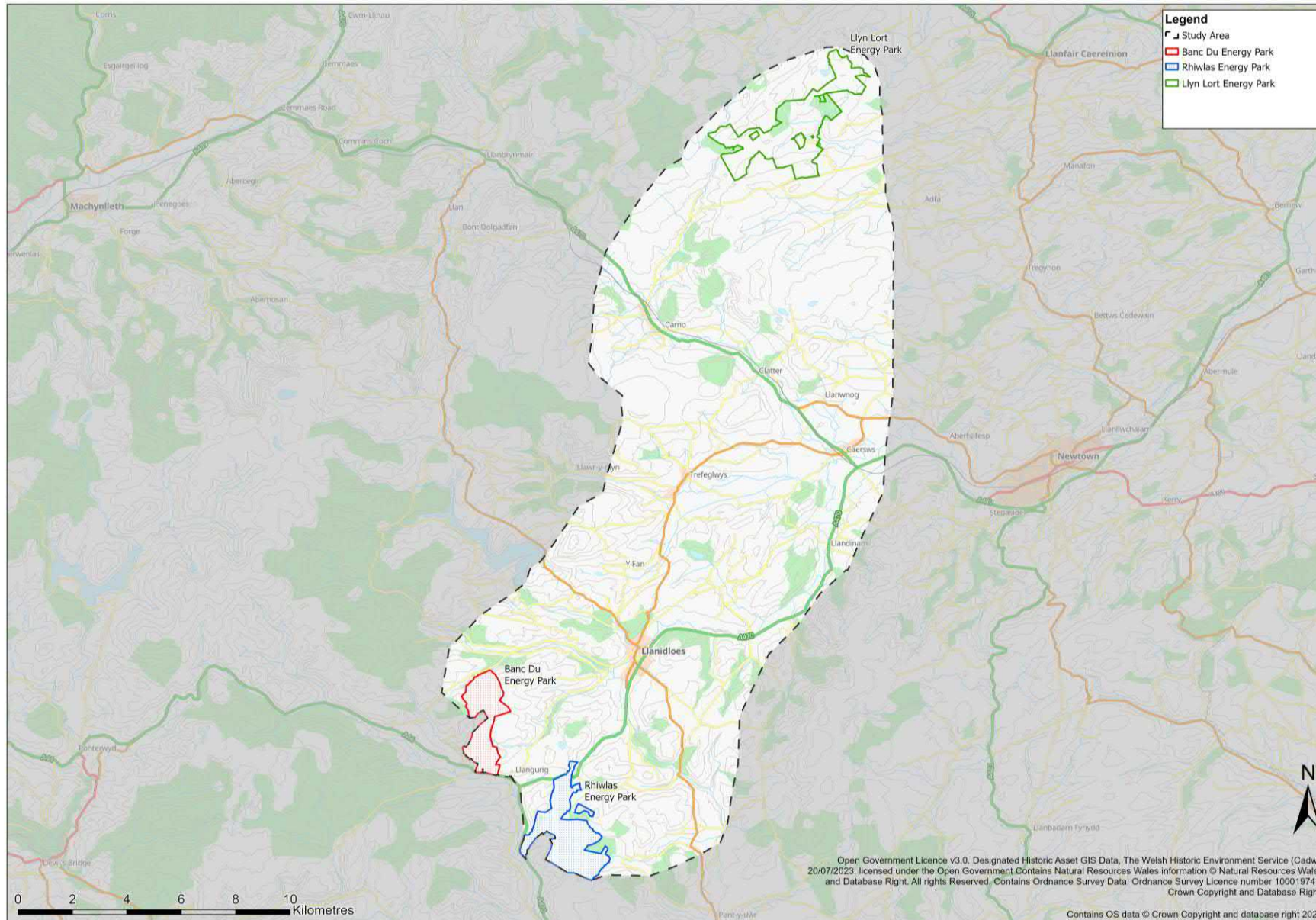
4.2.1 The initial step was to identify a suitably broad study area and based upon the location of the Banc Du and Rhiwlas and Energy Parks and the indicative area for the Collector Substation, a 10km wide swathe was mapped. The initial study area was drawn to ensure it was large enough to accommodate all potential OHL route options (**Figure 4.1**).

4.2.2 The study area was identified based on Holford Rule 3 (other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers). It also took account of topography (i.e., avoiding higher ground) existing overhead lines, river crossings and rail crossings which all present technical issues, slope angles (over 22 degrees) and the location of the local population and communities.

4.2.3 The study area identified extends broadly on a north to south alignment from Cefn Coch to Llangurig.

4.2.4 There are several settlements within the study area including Carno, Trefegwys, Llanidloes and Llangurig and a number of smaller settlements and scattered properties. Notable rivers cross the study area including the Afon Clywedog, Afon Hafren and Afon Brochan, with associated areas of floodplain.

Figure 4.1: Study Area



4.3 Step B: GIS Mapping of Routeing Considerations

4.3.1 Within the study area routeing considerations were mapped which primarily reflected the Holford Rules, taking into account a number of constraints relating to areas of high amenity value. The presence of the following environmental routeing considerations was used to inform the identification of corridor options (as show on **Figure 4.2, Figure 4.3, Figure 4.4 and Figure 4.5**).

- National Parks
- Special Protection Areas (SPA)
- Special Areas of Conservation (SAC)
- Ramsar Sites
- Sites of Special Scientific Interest (SSSI)
- National Nature Reserves
- Conservation Areas, Listed Buildings and Scheduled Monuments
- Registered Historic Parks and Gardens
- Transport (Road & Railway)
- National Cycle Networks and Recreation Trails
- Settlements (as identified in the Local Development Plans (LDP)
- Topography
- Forestry / woodland (including ancient woodland)

Figure 4.2: Criteria and sub-criteria used in corridor appraisal (Section A): Biodiversity, Geological Conservation, Forestry, Land Use and Flood Risk

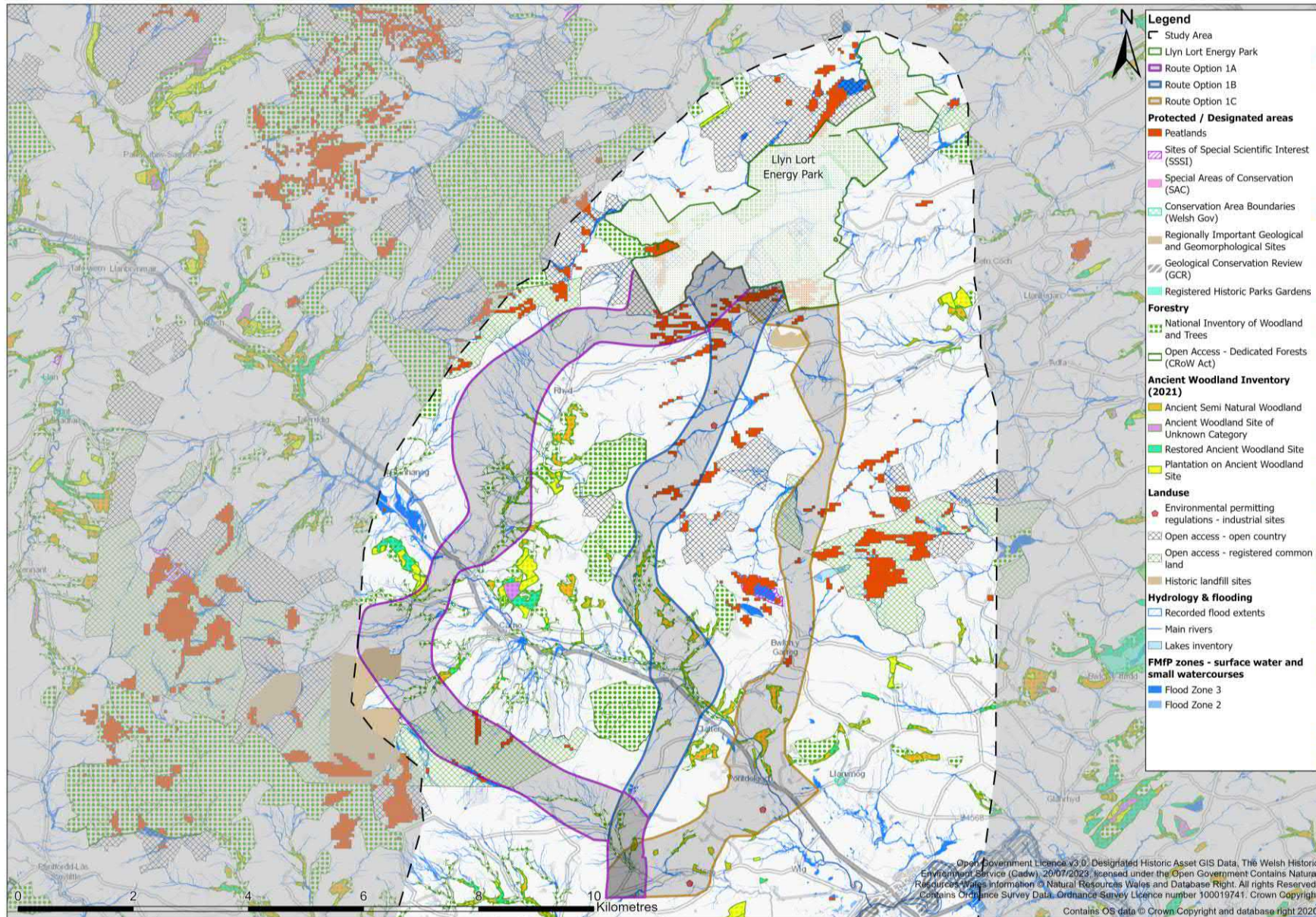


Figure 4.3: Criteria and sub-criteria used in corridor appraisal (Section B): Biodiversity, Geological Conservation, Forestry, Land Use and Flood Risk

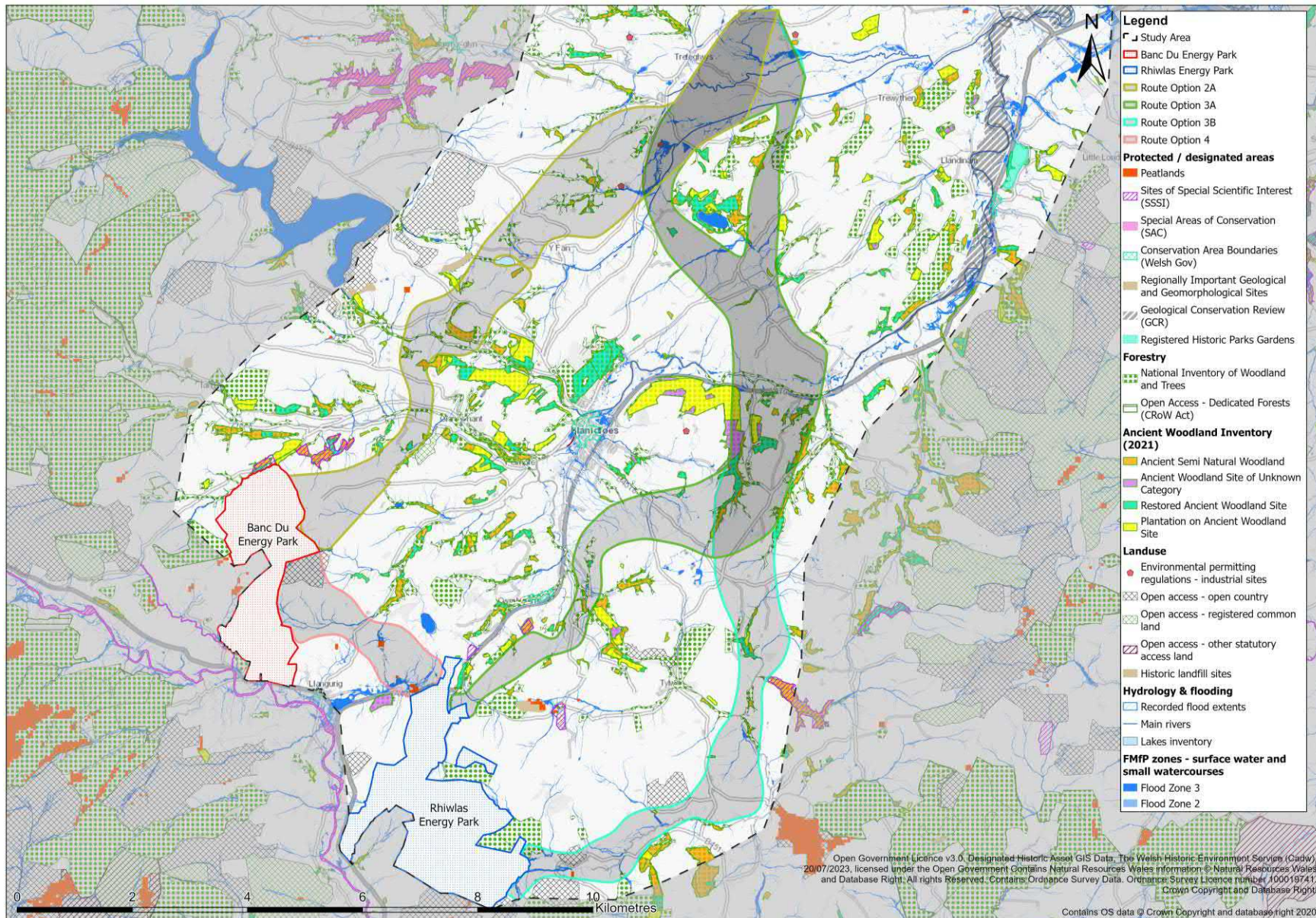


Figure 4.4: Criteria and sub-criteria used in corridor appraisal (Section A): Cultural Heritage and Landscape and Visual Amenity

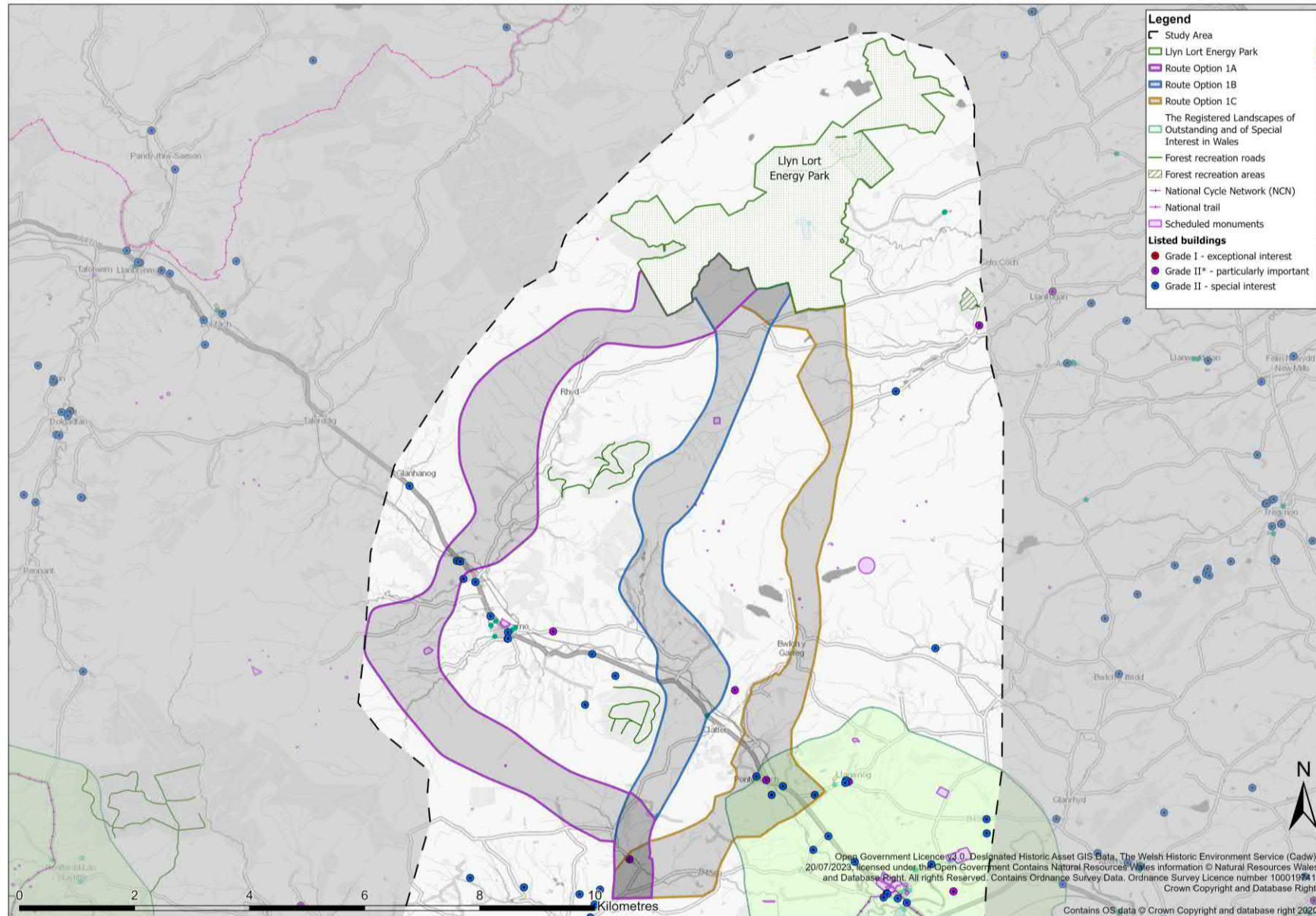
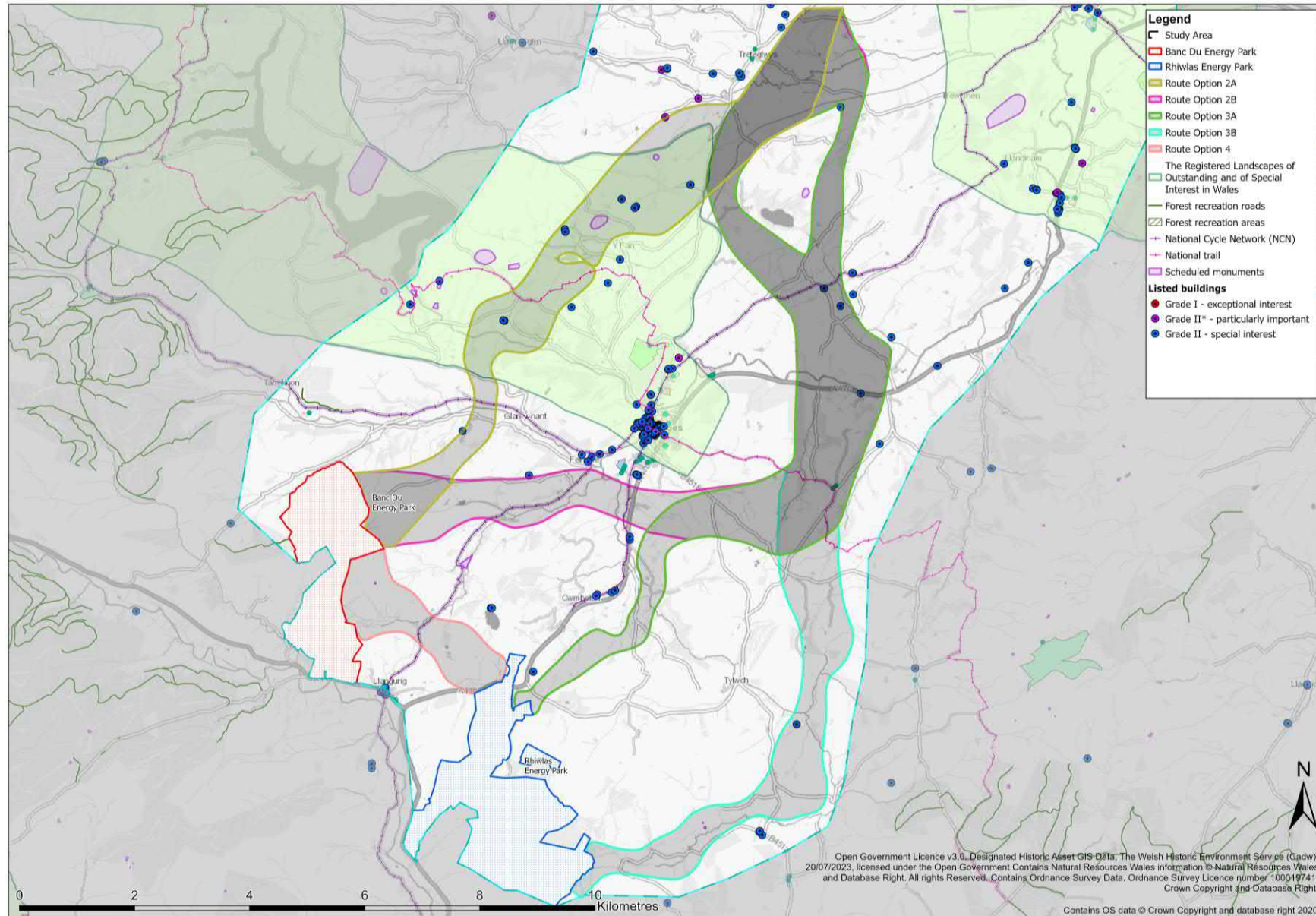


Figure 4.5: Criteria and sub-criteria used in corridor appraisal (Section B): Cultural Heritage and Landscape and Visual Amenity

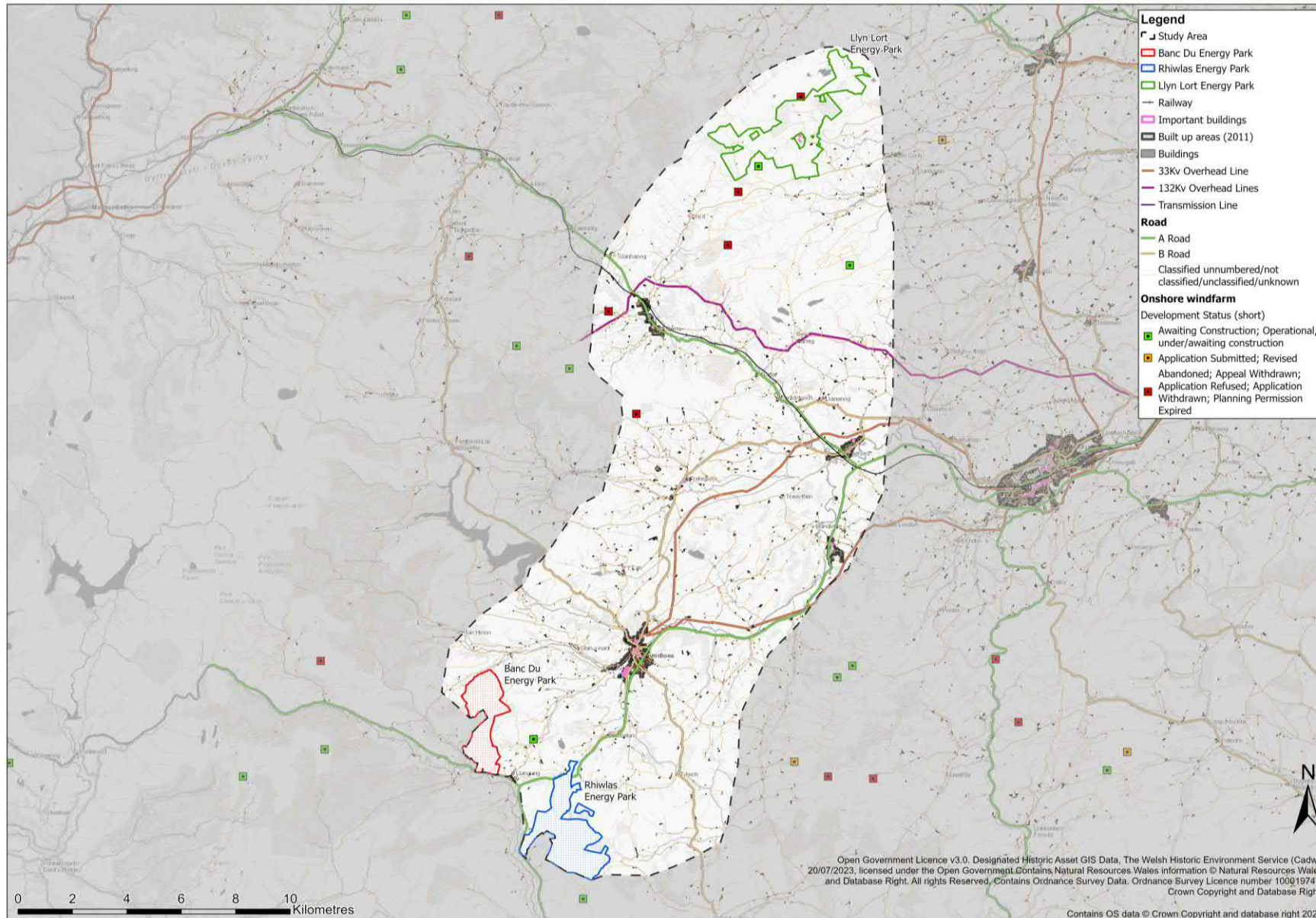


- 4.3.2 The mapping also includes LANDMAP data. LANDMAP is a complete all-Wales GIS based landscape resource where landscape characteristics, qualities and influences on the landscape are recorded and evaluated into a nationally consistent data set. Planning Policy Wales advocates the use of LANDMAP to inform development decisions. There are five aspects areas which have spatially mapped and evaluated. The five aspects are:
- Geological Landscape
 - Landscape Habitats
 - Visual & Sensory
 - Historic Landscape
 - Cultural Landscape Services
- 4.3.3 Areas which have been evaluated as outstanding in each of the above areas were mapped to inform decisions on corridors and corridor selection.
- 4.3.4 The approach to the identification of corridor options was to avoid larger areas constrained by the designations noted above. It was not possible to avoid all of the above constraints entirely. This is particularly the case with smaller designated areas such as Scheduled Monuments, SSSIs and some settlements. Concentrations of these features were avoided. The broad nature of the corridor means that there is a degree of flexibility to seek to avoid certain environmental and planning constraints at the detailed routeing stage.
- 4.3.5 Other areas were noted as 'non-absolute' constraints for the identification of corridor areas. These included Special Landscape Areas (SLAs) and Registered Historic Landscapes (RHLs). It was not possible for the corridor options to avoid these entirely due to their geographic scale and location within the study area, however corridor selection sought to minimise the length of overlap of the proposed OHL with these areas. These areas were used to inform the appraisal and selection of the preferred corridor (see **Section 4.7**). There are two Registered Landscapes of Outstanding and of Special Interest in Wales that intersect with the study area, Clywedog Valley & Caersws Basin. There are also SSSI designations including Coed Craig-iar, Gwaun Cilgwyn, Gwaun Bwlch Hafod-y-gog, Coed Mawr, Coedydd y Beili, Malgwyn a Cribin and the River Severn (Caerswys) SAC designation.
- 4.3.6 OS data has been used to map the main areas of built form, with postcode data used to consider the distribution of smaller groups and individual properties. In accordance with Holford Rule Supplementary Note - Avoid routeing close to residential areas as far as possible on grounds of general amenity.
- 4.3.7 The following technical routeing considerations were also mapped (see **Figure 4.6**) as these would present challenges for routeing the OHL:
- Steep slopes: areas where slopes of 22 degrees or more were calculated from OS Terrain 50 data and mapped to highlight where there may be technical challenges to routeing.
 - Existing OHLs: there is an existing 132kV wood pole line (trident) between Carno and Newtown via the Tirgwynt Substation. There are two 33kV wood pole lines between Llanidloes and Newtown and a section of 33kV cable between Tirgwynt Windfarm and Tirgwynt Substation. The Project will need to cross the 132kV wood pole as is unavoidable and may need to consider paralleling. **Holford Rule 6** – In all locations minimise confusing appearance.
 - Wind farms which were operational, under construction, consented or with a valid application were mapped, as these require to be avoided by the OHL where possible. The closest ones are Tirgwynt, Mynydd Clogau, Carno B plus possible extension, Lllandinam and Bryn Titli.

- In addition, river crossings and rail crossings were mapped and considered, as they all present technical issues.

- 4.3.8 The study area to the west was limited by the presence of Llyn Clywedog, a reservoir created to control the flow of water into the River Severn/Afon Hafren. Within the study area there are a number of rivers which may require crossing including the Afon Carno, Afon Trannon, Afon Clywedog, River Severn/Afon Hafren and the Afon Dulas which form the main river valleys. The River Wye/Afon Gwy is located to the south of Banc Du Energy Park but outside the study area. It was considered that it would not be preferable to connect Banc Du and Rhiwlas to the south as this would mean crossing the River Wye/Afon Gwy twice.
- 4.3.9 Woodland was mapped using the National Inventory of Woodland and Trees. Although not a hard constraint, it was sought to avoid woodland to reduce the amount of vegetation removal required.
- 4.3.10 Note on Holford **Rules 4 & 5** - Where possible avoiding cutting extensive swathes through woodland blocks and consider opportunities for skirting edges of copses and woods. Protecting existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape

Figure 4.6: Considerations influencing corridor option selection: Existing Infrastructure



4.4 Step C: Identification of Corridors

OHL Corridor Options

- 4.4.1 The Holford Rules (**Rule 4**) indicate that OHL infrastructure is deemed most visible when located on higher ground, for example ridges and skylines, therefore the identification of corridors favours lower lying topography. Furthermore, Holford **Rule 3** states that all other things being equal, the most direct line should be taken, with the smallest distance and minimal changes in direction. Based upon these primary rules and the constraints discussed above, figures were produced to inform preliminary fieldwork undertaken to identify corridor options.
- 4.4.2 **Holford Rules 4 and 5** formed the basis for the landscape led identification of corridors in the field. These rules state that OHL infrastructure is judged to be more widely visible from surrounding areas when located on higher ground, for example on ridges and skylines. Direct corridors with fewer 'bulky' angle structures are recommended, as is the avoidance of 'wirescape' (i.e., cumulative effects of multiple OHLs). Consideration was therefore given to the potential 'fit' of the line within the landscape. Key objectives were as follows:
- Follow the grain of the landscape, following moderately open valleys and avoiding complex terrain.
 - Minimise the exposure of towers on ridges and skylines.
 - Avoid impacts on woodland where possible.
 - Use woodland and topography as a backdrop to the line, or as a foreground screen.
 - Minimise the number of crossings of linear features (e.g., roads and rivers), and when appropriate cross at a perpendicular angle.
 - Avoid creating wirescapes with existing infrastructure (noting that in some cases it may be preferable to co-locate routes than to spread effects across a wider area).
 - Avoid key views from recreational locations, such as popular walking routes, summits and promoted viewpoints, including those outside the route corridors where appropriate.
 - Avoid residential areas as far as practicable.
 - Other things being equal, prefer the most direct alignment.
- 4.4.3 The landform of the study area played a large part when identifying the corridors. The required OHL goes north south and the valleys tend to go from east to west, meaning that careful consideration was required with regards to following valleys and ensure compliance with the Holford Rules.
- 4.4.4 Site visits identified viable options in the north, a common section where there was only really one option for the routeing and then a number of viable options in the south. Potential routes between Banc Du and Rhiwlas Energy Parks and what would be the most efficient option were also considered.
- 4.4.5 Taking all of the above information into account, and after undertaking the initial site visit, a number of draft corridors were identified for further analysis. These include (described from north to south):
- **1A** – A corridor from the Collector Substation to Trefeglwys to the west of Carno. This corridor contains the existing 132kV wood pole line so a section of paralleling may be required.
 - **1B** – A corridor from the Collector Substation Llyn Lort to Trefeglwys to the east of Carno. This corridor passes through an area of steeper slopes which may be technically challenging but avoids many constraints.

- **2A** – A corridor from Trefeglwys to Banc Du passing through the Landscape of Outstanding Historic Interest. It is the shortest route and has been included to get heritage inputs on this option in respect of the non-statutory designation.
- **2B** – A corridor from Trefeglwys to Banc Du passing east of Llanidloes.
- **3A** – A corridor from Trefeglwys to Rhiwlas broadly following the route of the A470 and connecting to the northern end of the energy park. Corridor 3A diverges either side of the steep wooded slopes up from the River Cerist floodplain towards Llyn Ebyr. There are a number of coppices, plantations and woodland (including restored ancient woodland) in this area as well as Llyn Ebyr itself and Pen y Castell Mound & Bailey Castle (a scheduled monument). These constraints combined with the steep terrain mean that a direct route is not possible, and that initial corridors to the east and west were identified.
- **3B** – A corridor from Trefeglwys to Rhiwlas connecting to the southern end of the energy park.
- **4A** – A corridor linking Banc Du and Rhiwlas.

4.4.6 An overview of the identified corridor options is shown in **Figure 4.7** and **Figure 4.8**. The figures highlight that the corridor options were split into the following distinct sections, 1A, 1B, 1C to the north, the common section, 2A and 2B in the south-west, 3A and 3B in the southeast and 4, which connects Banc Du to Rhiwlas Energy Parks.

Figure 4.7: Corridor Section A: Route Options 1A, 1B and 1C

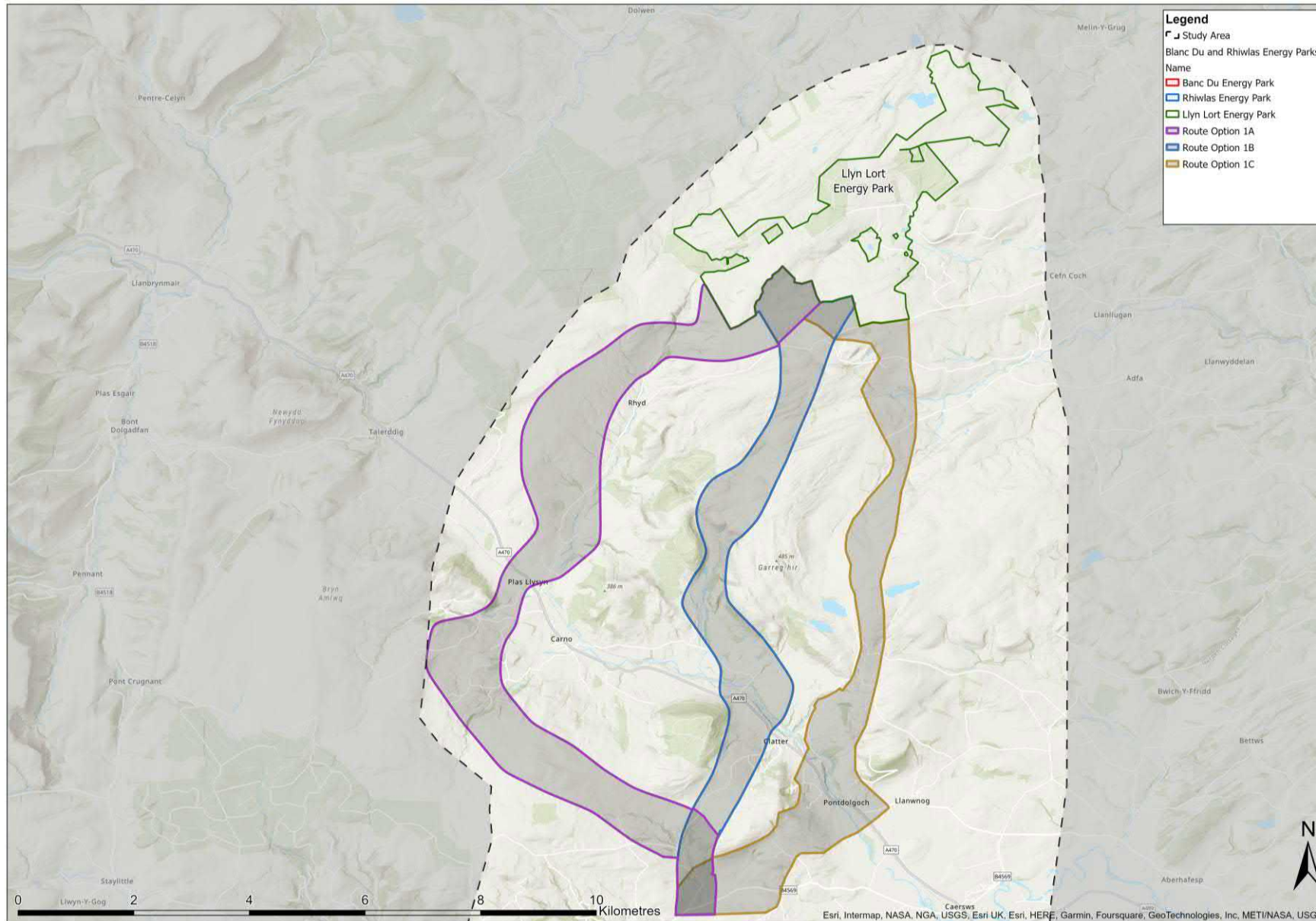
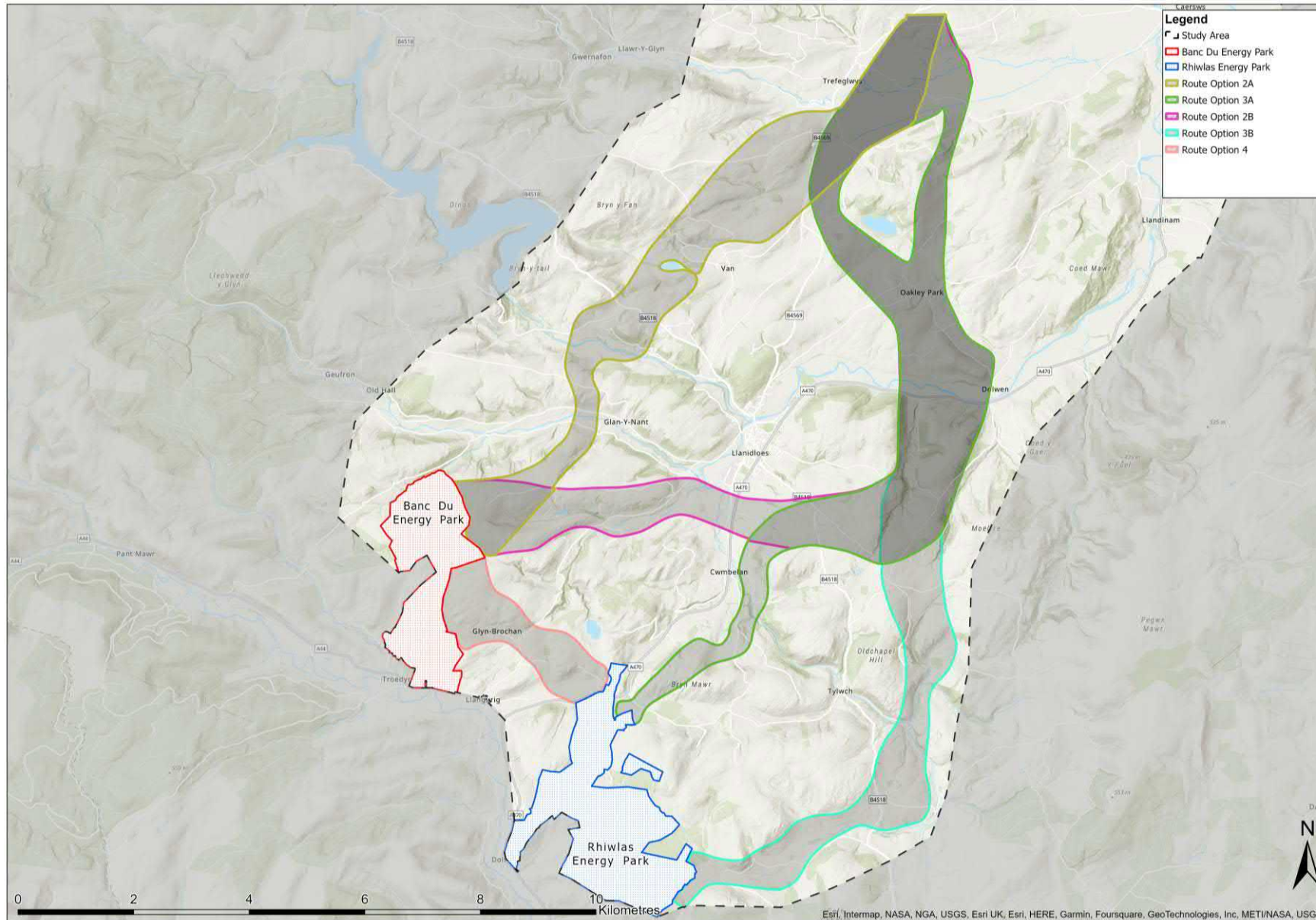


Figure 4.8: Corridor Section B: Route Options 2A, 2B, 3A, 3B and 4



4.5 Step D: Appraisal of Corridors

- 4.5.1 To identify a preferred corridor, the corridor options were appraised relative to each other in the north or the south across a range of criteria.
- 4.5.2 The appraisal process sought to draw out distinctions between the corridors to enable the relative strengths and weaknesses of each to be identified. Professional judgement, informed by the desk studies, GIS mapping and field work, was employed to identify the preferred corridor within which route options could be identified to accommodate the OHL.
- 4.5.3 The comparative appraisal of corridor options was undertaken considering designations and sensitive areas identified in Phase 3.
- 4.5.4 The appraisal considered the following key areas.
- Length of Corridor
 - Landscape Sensitivity and Visual Amenity.
 - Biodiversity and Geological Conservation.
 - Cultural Heritage.
 - Forestry and Woodland.
 - Hydrology and Flood Risk.
 - Other considerations included Land Use, Geology, Transport and Noise & Vibration to ensure that there were no other environmental issues.
- 4.5.5 Each corridor option was examined and then a preferred corridor was identified for each of the technical areas. The appraisal process and findings are captured within appraisal tables, and these were reviewed at a Corridor Workshop. The appraisal tables are provided in **Appendix A**.
- 4.5.6 This selection process involved using professional judgement on the potential significant impacts and how these could be avoided or minimised. A hierarchical approach was applied, with the general principle being that corridors were preferred which offered opportunities to avoid constraints. Where there was a conflict between the environmental areas, further discussion was had to determine the opportunities to avoid the impact at a later stage (i.e. through careful micro siting) or to agree what the priority should be.

Northern Section

- 4.5.7 The appraisal of the northern corridor section (Options 1A, 1B and 1C) identified that, based on the balance of all criteria and sub-criteria, Corridor Option 1B (east) is the preferred corridor. Particular considerations in its favour are:
- It is the shortest corridor; and
 - It is preferred in relation to landscape and visual grounds with no discernible difference between 1A and 1B from a biodiversity perspective.
- 4.5.8 1B was the preferred route option in relation to the landscape and visual criterion. It was considered that 1B was the shortest route, with greater potential for backgrounding further south as the corridor passes through valleys. Some linear areas of woodland between Coed Pantygysail and the A470 were considered beneficial to provide screening of the OHL's.
- 4.5.9 There was no preference between the corridor options from a geology, transport, or groundwater perspective.

- 4.5.10 There was a preference of 1B from carbon from a materials perspective as it is the shortest route, meaning the least embodied carbon associated with construction. Surface water also chose 1B as the preferred route as it encroaches on the smallest area that is at high risk of flooding.
- 4.5.11 From a noise and vibration perspective, there was a corridor preference of 1A or 1B, which had the least amount of noise sensitive receptors. It was advised that 1C would not be preferred.
- 4.5.12 However, it was noted that at detailed routeing, potential effects on the setting of cultural heritage features as well as minimising loss of woodland and minimising infrastructure within the flood risk areas will form key design considerations.

Common Section

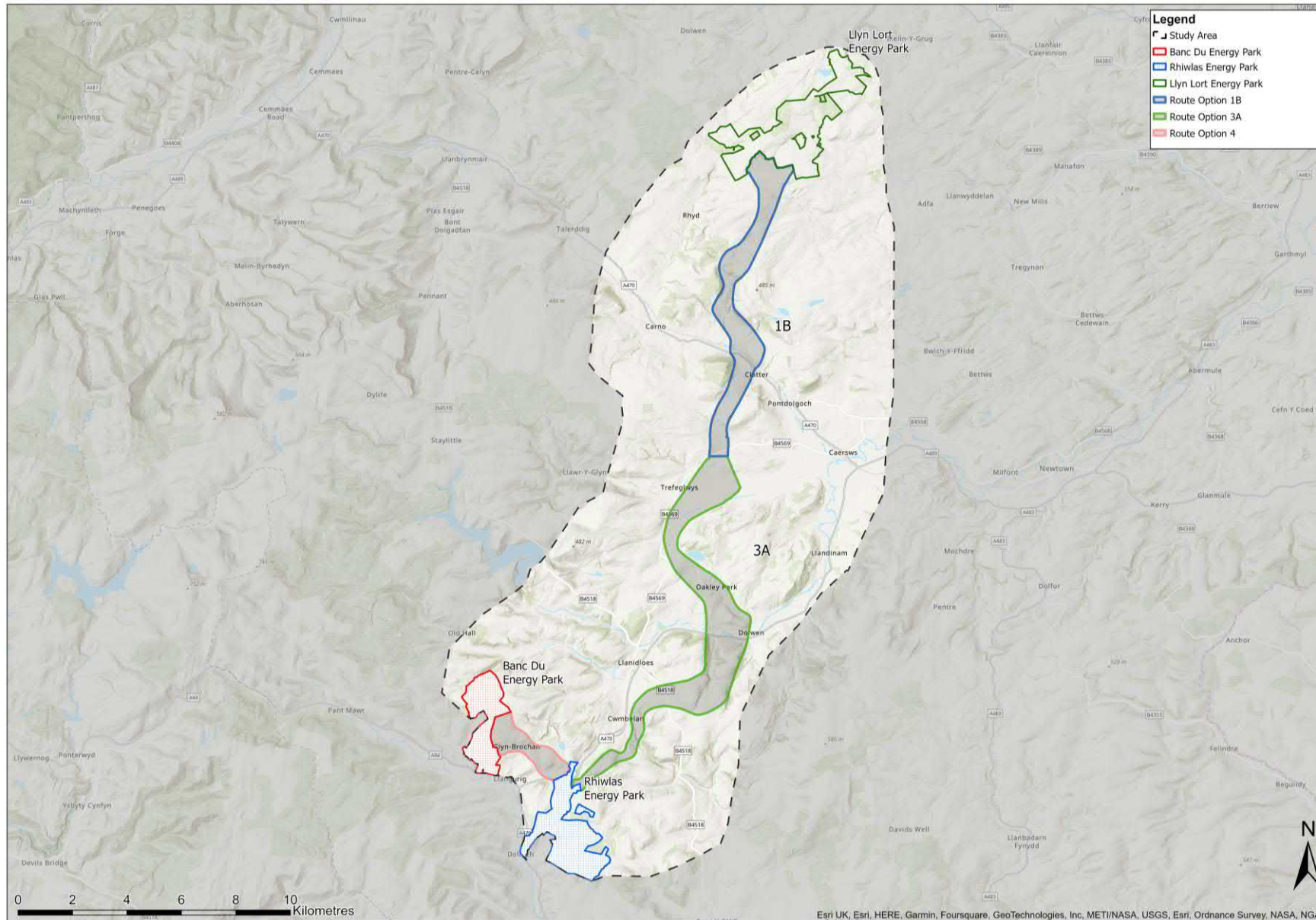
- 4.5.13 The common section review did not identify any significant issues with regards to the environmental impacts.

Southern Section

- 4.5.14 The appraisal of the southern corridors (Options 2A, 2B, 3A and 3B) identified that on balance Corridor Option 3A is the preferred corridor. Particular considerations in favour of this option are:
- It is the second shortest and is preferred in relation to landscape and visual criteria.
 - It has slightly lower risk of bird strike than the western options that are closer to the large waterbodies
- 4.5.15 No clear preference from geology, transport, groundwater or surface water.
- 4.5.16 From a carbon perspective, Corridor Option 2A being the shortest distance would likely mean least embodied carbon associated with construction.
- 4.5.17 Corridor Option 3A was the preferred route option in relation to the landscape and visual criterion. It was considered that landscape character was of low or medium sensitivity to small scale OHL development. Topography and woodland cover offer potential for backgrounding and screening. There is a generally low density of scattered properties, however greater density in mid-section of the corridor to east of Lanidloes may present a constraint (as per 2B and 3B).
- 4.5.18 In relation to ecology, there was a slight preference for 2A due to the shorter length of the route. This corridor is towards the edge of the Important Curlew Area and terrain is likely to be more giving in terms of avoiding impacts to ancient woodland/important habitats.
- 4.5.19 However, it was noted that at detailed routeing, potential effects on ancient woodland, peat and on the setting of cultural heritage features will form key design considerations.
- 4.5.20 As described above, the northernmost part of corridor 3A diverges either side of the steep landform from the River Cerist floodplain (southeast of Trefeglwys) as it rises to the south up to Llyn Ebyr. The western limb of the corridor broadly follows the river towards the small hamlet of Cerist and then rises up the shallower slopes south of Llyn Ebyr towards Cefn Bach. The eastern limb of the corridor follows a more direct alignment between the Glasgoed Plantation and Bryn-y-Castell Wood and passes Llyn Ebyr and the Pen y Castell Mound & Bailey Castle (a scheduled ancient monument) to the east and southwards to Cefn Bach where the two limbs re-merge.
- 4.5.21 Due to the eastern limb's proximity to the scheduled ancient monument, Llyn Ebyr and the need for routing in and around the plantation and woodland areas, this limb has been discounted from further consideration at this stage based on the comparably lesser ecological, cultural heritage and arboricultural constraints associated with the western limb. An initial appraisal in terms of constructability and engineering also supports the exclusion of the eastern limb at this stage given that brings additional complexity in terms of forestry crossing design and installation and there are limited safe points of access to the area to facilitate construction. The remaining figures in this report therefore only present the preferred 3A corridor to the west and south of Llyn Ebyr.

- 4.5.22 The appraisal of the link at section 4 identified that there were a number of viable options to link Banc Du and Rhiwlas Energy Parks. At this stage, it is considered that the most suitable (and least impacting) method of connection between the two would be to design an underground cable that would utilise the existing roads and access tracks between the two. With the preference for Corridor Option 3A it is considered that the route would start at Banc Du, link to Rhiwlas and then the OHL to would connect to the Collector Substation.
- 4.6 **Step E: Technical Review**
- 4.6.1 A technical review of the corridor options was undertaken by Green GEN Cymru and the notes on the method and scope of this review are provided in **Appendix B**.
- 4.7 **Step F: Preferred Corridor Selection**
- 4.7.1 The emerging preferred corridor consisting of Corridor Options 1B, 3A (east) and 4 was reviewed by technical specialists to identify any significant constraints that might prevent identification of a viable route option within it.
- 4.7.2 This assessment indicated that the preferred corridor was appropriate to progress into the next routeing stage. **Figure 4.9** shows the preferred corridor for progression to the next stage: Route Option Identification and Selection.

Figure 4.9: Preferred Route Corridor



5 Consultation Process

5.1 Introduction

5.1.1 Green GEN Cymru is committed to consulting comprehensively on its proposals for the Rhiwlas Green Energy Network project. This is so feedback from stakeholders and communities can be taken into account in the decisions made on the project.

5.1.2 This chapter provides an overview of the consultation Green GEN Cymru will undertake for the proposals. It covers:

5.1.3 An overview of a multiple-stage consultation and where, who and when the project is consulting in stage one;

- How Green GEN Cymru is consulting, including the materials that will be prepared and the engagement activities that will be undertaken;
- Why feedback is important and how it influences the development of the proposals; and
- How to provide feedback.

5.1.4 The first stage of consultation is open from **15 November 2023 to 10 January 2024**.

5.2 Why Consult?

5.2.1 Green GEN Cymru is developing a stronger, more resilient renewable electricity network that is greatly needed to distribute clean, green energy. The proposals increase access to new renewable energy, helping address the biggest threat facing us and future generations – the climate emergency. The proposals will be designed to enable the connection of other energy parks, community projects, and support energy resilience.

5.2.2 Delivering the infrastructure we need to address climate change, requires a careful balance. Green GEN Cymru is focused on causing the least disturbance to those who live, work and enjoy recreation close to the proposals and is committed to protecting the surrounding environment.

5.2.3 It is important to Green GEN Cymru that communities and stakeholders have the opportunity to comment on proposals at an early stage so decisions can be made in view of their feedback and identify ways to reduce or avoid effects, and create opportunities.

5.2.4 Green GEN Cymru is committed to ensuring its community consultation is accessible, understandable and meaningful. These guiding principles have informed the information set out in this chapter and the materials that will be provided for the consultation in late 2023/early 2024.

5.3 Green GEN Cymru Proposals in Mid Wales

5.3.1 The existing electricity network in Mid Wales does not have the capacity to connect new renewables projects to the national grid. This includes Bute Energy's proposed Banc Du & Rhiwlas Energy Parks near Llangurig. Green GEN Cymru is providing a new connection so the energy generated can be used by homes and businesses, locally and nationally.

5.3.2 The work to consider the most suitable route for the OHL is laid out in more detail in earlier sections of this document.

5.3.3 The proposals for the Rhiwlas Green Energy Network include:

- A 132kV (132,000- volt) overhead line, supported on wood poles, between Rhiwlas Energy Park and a new collector substation near to Cefn Coch, Llanfair Caereinion (part of Green GEN Cymru's Vyrnwy-Frankton connection project)
- An underground cable route approximately 3km long, at the lower voltage of 33kV, to connect the proposed Banc Du and Rhiwlas Energy Parks.

5.4 Benefits and impacts of the Green GEN Cymru proposals

- 5.4.1 The proposals increase access to new renewable energy, helping address the biggest threat facing us and future generations – the climate emergency. The Rhiwlas Green Energy Network will be designed to transport the clean, green energy generated by Bute Energy’s proposed Energy Parks, to the homes, businesses, hospitals and communities that need it, helping to support Wales’ energy resilience.
- 5.4.2 These benefits cannot be achieved, however, without some effects, including those which are linked to the construction and operation of the proposed new connection and the associated development. These potentially include effects on landscape and visual amenity; ecology and ornithology; water quality and flood risk; cultural heritage; noise and vibration; land use including woodland and transportation and socio-economic factors.
- 5.4.3 Many of these effects can be reduced or avoided through careful routeing, design and the use of mitigation measures – part of the reason for consulting is to get views on how this can best be achieved.

5.5 Green GEN Cymru plans for consultation

- 5.5.1 Green GEN Cymru is planning three stages of consultation to invite comments on the proposals, prior to making a Development of National Significance application. An indicative overview of the consultation stages and dates for these can be found in **Table 5.1** below.

Table 5.1: Overview of each consultation stage for the Rhiwlas Green Energy Network

Stage	Overview of consultation	Date
Stage one: Non-statutory consultation	Work to date to identify route options. Identification of local issues and further considerations Proposed route in which a connection could be developed.	Late 2023 / early 2024
Stage two Non-statutory consultation	Proposed route for the new connection including sites for the infrastructure required. Initial overview of associated land use for use during construction, such as lay down areas. Indicative transport routes and vehicle movements.	Late 2024
Stage three: Statutory consultation	Statutory Pre-Application Consultation process to align with Development of National Significance legislation. Draft Environmental Statement and planning application documents available to review, including findings from survey and assessments undertaken as part of Environmental Impact Assessment (EIA)	Mid 2025

- 5.5.2 Through all Green GEN Cymru consultation stages a mix of physical and digital engagement will be utilised to maximise the opportunities for local communities to provide their feedback.
- 5.5.3 The project website will be the primary means of accessing information about the proposals and the preferred method for providing feedback. The digital platform will be suitable for both desktop

and mobile devices. However, this will be accompanied by physical engagement methods including mailings to addresses, community events, and hard copies of consultation materials being available.

5.6 Stage One Consultation- Autumn 2023

Where Green GEN Cymru is consulting?

- 5.6.1 Green GEN Cymru has defined an area in the vicinity of the proposals based on the potential impacts of the proposals (such as visual effects and/or effects from construction). This area comprises approximately 1km from either side of the preferred route corridor, the consultation zone. This approach is also consistent with previous Green GEN Cymru projects.
- 5.6.2 The majority of the proposed community consultation activities will be focused on this zone, including information publicising the consultation being issued to households, and community events. Where suitable venues are not available in the consultation zone events will be organised in the nearest population hubs.
- 5.6.3 Green GEN Cymru will also undertake activities to promote broad awareness of the consultation outside the consultation zone. This will include local advertising and notifying relevant stakeholders across the wider region.

Who Green GEN Cymru is consulting?

- 5.6.4 Those living and working in the consultation zone - Green GEN Cymru is primarily seeking to engage with the communities and stakeholder groups within the consultation zone. This will include residents, businesses, and their elected representatives.
- 5.6.5 Seldom heard groups - Green GEN Cymru recognise that there are individuals and groups that may have difficulties taking part in the consultation process, such as young and elderly people; people with a physical disability or learning difficulty; or whose first language is not Welsh or English. Requests for consultation materials to meet specific requirements (such as Braille or foreign languages, or for those with literacy difficulties) will be considered on a case-by case basis to establish how best to provide information.
- 5.6.6 People with an interest in land - Organisations and individuals who have a legal interest or right in the land potentially affected by the proposals at this stage.
- 5.6.7 Recreation and interest groups - Additionally, where local and other stakeholder organisations have a particular interest in or specific knowledge of a topic relevant to providing feedback on the proposals – such as landscape, wildlife, heritage, commerce, tourism, agriculture – Green GEN Cymru will also notify them of the consultation and invite their feedback.

What Green GEN Cymru is consulting on?

- 5.6.8 Green GEN Cymru is consulting on:
 - The work done to date to identify the preferred OHL route corridor between Rhiwlas Energy Park and the new substation, proposed as part of Green GEN Cymru's Vyrnwy-Frankton connection project, near Cefn Coch, Llanfair Careinion;
 - The work done to date to identify the preferred route corridor for the underground cable connection between Rhiwlas Energy Park and Banc Du Energy Park;
 - Any factors which residents near to the preferred route corridor feel have not been considered in the identification of the proposed route;
 - Any specific factors residents feel Green GEN Cymru should consider when developing its proposals;

- What issues local residents feel should be addressed by the Bute Energy Community Benefit Fund, and whether there are any specific groups, projects or initiatives who should be engaged as part of this project; and
- Views on the role of renewable energy in tackling climate change and the impact which current grid capacity has on the ability to meet net zero goals.

Public Exhibitions and Webinars

- 5.6.9 Green GEN Cymru is holding community events to give people the opportunity to learn more about the Rhiwlas Green Energy Network project, talk to the Green GEN Cymru team and ask questions. Large scale maps, photos and other materials will be available to view at in person events. Welsh and English speaking staff will also be at all of the events. Details of these events can be found in **Table 5.2** below.

Table 5.2: Public drop-in event details

Venue	Date	Time
Cefn Coch Inn, Welshpool, SY21 0AE	Thursday 30 th November 2023	14.30 – 19.30
Llangurig Community Centre, Llangurig, Llanidloes, SY18 6SG	Friday 1 st December 2023	14.30 – 19.30
Carno Community Centre, Carno, SY17 5LH	Tuesday 5 th December 2023	15.00 – 20.00

Consultation Materials

- 5.6.10 Green GEN Cymru is producing a range of materials for this consultation to ensure that residents, stakeholders and other interested parties are able to understand more about the project and how they can get involved and shape the plans at an early stage. The materials which have been produced are intended for the public and provide information on our proposals to support providing feedback – with more details about these being available in **Table 5.3** below.

Table 5.3: Overview of public consultation materials

Consultation Material	Overview
Project website	The project website will have details of the project proposals. It holds all consultation materials. The project website also hosts an interactive map, which enables users to scroll across the entire preferred route corridor and zoom in on areas of interest. A digital feedback form is also available, as are hard copies, which can be downloaded, printed and returned to the project team in person or via a freepost address. The project website will be hosted at www.rhiwlasGEN.wales, with a Welsh language version of the website hosted at www.rhiwlasGEN.cymru.
Consultation leaflet	A bilingual A5 consultation leaflet with a brief explanation of the project and clear signposts of how to find out more (including website, contact details for the project team and details of consultation events). The leaflet is being sent to all addresses in the consultation zone.

Consultation Material	Overview
Consultation brochure	A detailed document including an overview of, and indication of the need for, the project. The consultation brochure also includes maps of the proposed corridor broken down into sections, in addition to a brief summary of the topography of each section and how this has been considered when siting the preferred route corridor. The consultation brochure is available to download from the website, in hard copy on request from the project team, and will be made available to attendees at the drop-in events.
Consultation feedback form	Hard copy and digital versions of feedback form for consultees to provide comments. These forms include questions on the topics outlined in Section 5.6.8 above.
Drop-in event display materials	Display boards at the public drop-in events will provide information on a range of topics related to the project, as well as details of key project milestones and how to get involved in the consultation. The drop-in event display materials will be made available on the project website to coincide with the first public drop-in event.

- 5.6.11 Copies of the documents, plans and maps will be available free of charge in digital format in the first instance. Requests for hard copies will be reviewed on a case-by-case basis. A reasonable copying charge may apply (up to a maximum of £500 for one full suite of documents) depending on the extent of documents requested.

Enquires, information, and how to provide feedback

- 5.6.12 Green GEN Cymru will operate a freephone enquiry line between 9am and 5pm, Monday to Friday (excluding Bank Holidays), with an answer phone service in operation outside of these hours. The freephone number for the project is **0800 699 0081**.
- 5.6.13 A dedicated project email, **info@rhiwlasGEN.wales**, will also be available throughout the course of the project for residents and stakeholders to request additional information and provide their feedback.
- 5.6.14 A freepost address, **FREEPOST TC CONSULTATION**, will also be available should residents or stakeholders wish to send in their views, questions or feedback in writing.
- 5.6.15 Feedback will also be able to be provided online, via the project website – www.rhiwlasGEN.wales / www.rhiwlasGEN.cymru (CYM).
- 5.6.16 The first stage of consultation for the Rhiwlas Green Energy Network project will run from **Wednesday 15 November 2023** to **Wednesday 10 January 2024**. It is felt that will provide ample opportunity for local communities and stakeholders to engage with the proposals, whilst reflecting the fact that level of engagement is likely to reduce in the immediate run up to and over the Christmas period.
- 5.6.17 Feedback will need to be received by **23:59 on 10 January 2024**. Any feedback received after this day may not be considered by the team.
Feedback will need to be received by 23:59 on 10 January 2024. at this time.
- 5.7 **How Green GEN Cymru will use feedback**
- 5.7.1 Green GEN Cymru will draw together all of the feedback and respond to the themes and issues raised in a feedback report. In this way, everyone will be able to see all of the themes and issues raised and how Green GEN Cymru plan to take them into account.

5.7.2 Green GEN Cymru will use the feedback to review the decisions made to date and to inform the work going forward. The next steps will involve more detailed routeing and siting including the identification of locations for the wood poles and additional infrastructure.

5.7.3 In making these decisions, Green GEN Cymru will also consider:

- Further information gathered as part of ongoing environmental assessments;
- Additional requirements based on technical considerations;
- Feedback from statutory bodies and other organisations, such as Natural Resources Wales, Powys County Council and others;
- Our duties to develop a safe, efficient and affordable connection; and
- Planning policy and related guidance.

5.7.4 Green GEN Cymru will take into account all of these considerations and refine the proposals ready for the next stage of non-statutory consultation. A further, and final stage, of statutory consultation, will also be undertaken before a DNS application is submitted.

5.8 Next Steps

5.8.1 Comments to the consultation together with the findings of Green GEN Cymru's own assessments will influence the next stage of our proposals. Green GEN Cymru anticipate the next stage of work to refine the proposal for the Rhiwlas Green Energy Network will take several months.

5.8.2 Green GEN Cymru will keep people up to date during this time on the progress of the work (such as through community updates). When they are ready, Green GEN Cymru will present these proposals to people and explain how Green GEN Cymru has taken account of the comments received. Where Green GEN Cymru has not altered the proposals to reflect comments, the reasoning will be explained.

5.8.3 The timeline below sets out the indicative key milestones for the project at the time of writing. These milestones may be subject to change, and updates will be made to the timeline over the coming months.

- **Non-statutory consultation on the preferred route corridor** - November 2023 to January 2024
- **Review of feedback and refinement of route options** - Early 2024
- **Submission of EIA scoping request to Planning & Environment Decisions Wales** - Early 2024
- **Ongoing technical surveys and assessments and development of design** - Mid/late 2024
- **Further non-statutory public consultation** - Late 2024
- **Statutory Pre-Application Consultation** - Mid 2025
- **DNS application submission** - Late 2025
- **Rhiwlas GEN operational** - Mid 2028

6 Next Steps: Route Alignment and EIA

- 6.1.1 The feedback received from the consultation process will be considered in combination with the findings of this Routeing and Consultation Document to back check the preferred corridor and to inform the development of a 'preferred route' as the next stage in the development process.
- 6.1.2 The preferred route will include pole positions, which will be informed by the detailed surveys, discussions with landowners and ultimately presented in the Environmental Statement (ES). In early 2024, Green GEN Cymru will also seek a Scoping Direction from the Welsh Ministers under The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. The Scoping Direction will confirm the scope and level of detail of the information to be provided in the ES.
- 6.1.3 The preferred route alignment, including all ancillary development, will be included in the DNS application to PEDW for planning consent.
- 6.1.4 Green GEN Cymru intends to consult fully with affected landowners and occupiers on all aspects of the project and will give them opportunity to comment on the proposals as they progress. This will include the public consultation on a detailed route alignment for the project.

Appendix A Environmental Technical Appraisal Table

Appendix A - Environmental Technical Appraisal

Topic / Corridor	1A - Western Corridor	1B - Central Corridor	1C - Eastern Corridor	Preference in Northern Section	2A - Western Corridor to Banc Du	2B - Eastern Corridor to Banc Du	3A - Western Corridor to Rhiwlas	3B - Eastern Corridor to Rhiwlas	Preference in Southern Section	4 - Overhead line between Banc Du and Rhiwlas	4 - Underground cable between Banc Du and Rhiwlas	Overall Comments	Further work required
Approx. Corridor Length (Note: these are approximate lengths, taken from the middle of each corridor. These may be slightly shorter or longer depending on preference within the corridor)	16.8km	11.6km	12.5km		14.1km	17.6km Could go either side of Llyn Ebyr	16.7km Could go either side of Llyn Ebyr	18.6km Could go either side of Llyn Ebyr		3km	3km		
Geology	Regionally important geodiversity site: Carno (RIGS 373). Crosses part of the corridor.	Nothing significant identified at this stage.	Regionally important geodiversity site: Tan-y-fael Quarry (RIGS 277). Appears to be active quarry. Small intrusion into corridor.	No preference if RIGs sites are avoided.	Potential small pockets of made ground near Y Fan.	Potential made ground near A470	Potential made ground near A470	Potential made ground near A470	No preference. Small amount of material may be encountered due to unlikely need for significant foundations. Material should be managed accordingly.	Nothing significant identified at this stage.	Nothing significant identified at this stage.	Potential for made ground to be encountered that is unknown, however unlikely to require significant foundations and therefore amount of material generated limited.	
Transport	There are at least 9 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses although these access points are limited so longer haul roads may be required. Access from the A470 west of Carno may also be difficult due to the proximity of the railway line and the segment of the highway.	There are at least 7 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses although these access points are limited so longer haul roads may be required.	There are at least 10 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses although these access points are limited so longer haul roads may be required. Access over railway may also be difficult due to the alignment of the highway at the bridge crossing.	NO CLEAR PREFERENCE. Access to each of the corridors are similar in that the majority of highways from which access points will be required are narrow single lane cartways that may be difficult for HGVs to navigate along which would require suitable mitigation such as passing places or road closure TM to allow suitable access.	There are at least 15 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses. There are a couple of potential issues on some of the highway along this corridor including two routes with sharp bends that may not be suitable for HGVs although alternative routes may be available.	There are at least 20 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses.	There are at least 18 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses.	There are at least 22 highways that are crossed by the corridor. Gaining access from most of these highways is potentially achievable either via existing upgraded field access, existing private accesses or from new accesses.	NO CLEAR PREFERENCE. Access to each of the corridors are similar in that the majority of highways from which access points will be required are narrow single lane cartways that may be difficult for HGVs to navigate along which would require suitable mitigation such as passing places or road closure TM to allow suitable access.	There are at least 2 highways and 3 private tracks that are crossed by the corridor. Gaining access from these highways is achievable either via existing upgraded field access, existing private accesses or from new accesses.		NO CLEAR PREFERENCE. Ensuring that emissions associated with construction, operation and land use change are all considered will be important going forward.	Once the corridor filtering exercise is completed, further investigation would be required via a site visit to determine whether the routes in the preferred Corridors are suitable of if there are any showstoppers that prevent access.
Carbon	Peat present at the northern extent of the route and to the south. Areas of forestry and woodland central and south.	Peat present at the northern extent of the route and in the centre. Areas of forestry and woodland central and south.	Peat present at the northern extent of the route and in the centre. Areas of forestry and woodland to the south.	From a materials perspective 1B being the shortest distance would likely mean least embodied carbon associated with construction. There are areas of peat and woodland on all corridors and efforts to minimise disruption to these areas as much as possible should be undertaken for all corridors.	No evidence of peat. Areas of forestry and woodland along the corridor.	No evidence of peat. Areas of forestry and woodland mainly central and southern areas of the corridor.	No evidence of peat. Areas of forestry and woodland mainly central and southern areas of the corridor.	No evidence of peat. Areas of forestry and woodland mainly central and southern areas of the corridor.	From a materials perspective 2A being the shortest distance would likely mean least embodied carbon associated with construction. There are areas woodland on all corridors and efforts to minimise disruption to these areas as much as possible should be undertaken for all corridors.	There are isolated areas of peat, mainly to the south and limited areas of forestry and woodland.	There are isolated areas of peat, mainly to the south and limited areas of forestry and woodland.	Research indicates that the emissions associated with overhead lines would be less than an underground cable, however there would be less embodied carbon which would need exploring. The same research suggests that emissions from construction are minimal over the lifecycle compared to operational losses so the design which can minimise these would be best to take forward.	Moving forward, a more detailed carbon assessment could quantify the difference between emissions associated with overhead or underground cables. Ensuring that emissions associated with construction, operation and land use change are all considered will be important going forward.
Landscape character (NCLA LANDMAP)	NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development. - Remote, tranquil and sparsely populated area with very few settlements - isolated farmsteads, where they exist, are often sheltered by coniferous shelter belts, this is in contrast to car parks, wind farms and reservoir infrastructure, all of which increase the suitability of the landscape to OHL development. Visual/Sensory Aspect Areas: mostly moderate value, a little high Esgar Cwmowen Uplands is high value and upland grazing landscape which is less suited to OHL development, however the aspect area occupies a relatively small proportion of the corridor.	NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development. - Remote, tranquil and sparsely populated area with very few settlements - isolated farmsteads, where they exist, are often sheltered by coniferous shelter belts, this is in contrast to car parks, wind farms and reservoir infrastructure, all of which increase the suitability of the landscape to OHL development. Visual/Sensory Aspect Areas: 50-50 high to moderate value Esgar Cwmowen Uplands is high value and upland grazing landscape which is less suited to OHL development, however the aspect area occupies a relatively small proportion of the corridor.	NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development. - Remote, tranquil and sparsely populated area with very few settlements - isolated farmsteads, where they exist, are often sheltered by coniferous shelter belts, this is in contrast to car parks, wind farms and reservoir infrastructure, all of which increase the suitability of the landscape to OHL development. Visual/Sensory Aspect Areas: Mostly high value, some moderate value Esgar Cwmowen Uplands is high value and upland grazing landscape which is less suited to OHL development and this aspect area occupies the majority of the corridor.	1B - Shortest route - Considered that landscape character is of medium sensitivity to small scale OHL development (as per 1A & 1C); predominantly areas of high, undulating landscape in north. More potential for backgrounding further south as corridor passes through valleys. Some linear areas of woodland between Coed Pantysgeail and the A470 to provide screening - Low density of scattered settlement throughout the corridor which it would be possible to avoid - No landscape designations or walking/cycling routes	Mostly NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development. - Remote, tranquil and sparsely populated area with very few settlements - isolated farmsteads, where they exist, are often sheltered by coniferous shelter belts, this is in contrast to car parks, wind farms and reservoir infrastructure, all of which increase the suitability of the landscape to OHL development. Some NLCA19 Severn Valley (Low sensitivity to the type of development proposed): Landscape character defined by river valley with steep valley sides, which are well-wooded with deciduous and coniferous plantation, giving a sense of containment. Lowland farmland and wetland associated with the river also interspersed with woodland/plantation. Topography and vegetation cover and pattern increase the capacity of the landscape to accommodate overhead lines. NLCA29 Radnorshire Hills (Low sensitivity to the type of development proposed): Landscape of two parts: steeply rounded undulating upland hills and ridges with distant views is less suited to OHL development, but enclosed pasture or forestry in valleys and lower hillsides with geometric fields defined by mixed native hedgerows interspersed with broadleaf woodland and upland coniferous plantation is more suited in character to the type of development proposed. Rural, tranquil area with very little settlement (which is confined to the lower valleys) but the influence of Llandinam masts and turbines are characteristics which increase suitability to OHL development. NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development.	Split between three NCLAs: NLCA19 Severn Valley (Low sensitivity to the type of development proposed): Landscape character defined by river valley with steep valley sides, which are well-wooded with deciduous and coniferous plantation, giving a sense of containment. Lowland farmland and wetland associated with the river also interspersed with woodland/plantation. Topography and vegetation cover and pattern increase the capacity of the landscape to accommodate overhead lines. NLCA29 Radnorshire Hills (Low sensitivity to the type of development proposed): Landscape of two parts: steeply rounded undulating upland hills and ridges with distant views is less suited to OHL development, but enclosed pasture or forestry in valleys and lower hillsides with geometric fields defined by mixed native hedgerows interspersed with broadleaf woodland and upland coniferous plantation is more suited in character to the type of development proposed. Rural, tranquil area with very little settlement (which is confined to the lower valleys) but the influence of Llandinam masts and turbines are characteristics which increase suitability to OHL development. NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development.	Predominantly split between two NCLAs: NLCA19 Severn Valley (Low sensitivity to the type of development proposed): Landscape character defined by river valley with steep valley sides, which are well-wooded with deciduous and coniferous plantation, giving a sense of containment. Lowland farmland and wetland associated with the river also interspersed with woodland/plantation. Topography and vegetation cover and pattern increase the capacity of the landscape to accommodate overhead lines. NLCA29 Radnorshire Hills (Low sensitivity to the type of development proposed): Landscape of two parts: steeply rounded undulating upland hills and ridges with distant views is less suited to OHL development, but enclosed pasture or forestry in valleys and lower hillsides with geometric fields defined by mixed native hedgerows interspersed with broadleaf woodland and upland coniferous plantation is more suited in character to the type of development proposed. Rural, tranquil area with very little settlement (which is confined to the lower valleys) but the influence of Llandinam masts and turbines are characteristics which increase suitability to OHL development. NLCA19 Severn Valley (Low sensitivity to the type of development proposed): Landscape character defined by river valley with steep valley sides, which are well-wooded with deciduous and coniferous plantation, giving a sense of containment. Lowland farmland and wetland associated with the river also interspersed with woodland/plantation. Topography and vegetation cover and pattern increase the capacity of the landscape to accommodate overhead lines. NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development.	Predominantly: NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development. - Remote, tranquil and sparsely populated area with very few settlements - isolated farmsteads, where they exist, are often sheltered by coniferous shelter belts, this is in contrast to car parks, wind farms and reservoir infrastructure, all of which increase the suitability of the landscape to OHL development. A tiny area of: NLCA29 Radnorshire Hills (Low sensitivity to the type of development proposed): Landscape of two parts: steeply rounded undulating upland hills and ridges with distant views is less suited to OHL development, but enclosed pasture or forestry in valleys and lower hillsides with geometric fields defined by mixed native hedgerows interspersed with broadleaf woodland and upland coniferous plantation is more suited in character to the type of development proposed. Rural, tranquil area with very little settlement (which is confined to the lower valleys) but the influence of Llandinam masts and turbines are characteristics which increase suitability to OHL development. NLCA19 Severn Valley (Low sensitivity to the type of development proposed): Landscape character defined by river valley with steep valley sides, which are well-wooded with deciduous and coniferous plantation, giving a sense of containment. Lowland farmland and wetland associated with the river also interspersed with woodland/plantation. Topography and vegetation cover and pattern increase the capacity of the landscape to accommodate overhead lines. NLCA21 Cambrian Mountains (Medium sensitivity to the type of development proposed): Landscape of two halves: - Smooth, undulating, extensive landscape, very exposed upland plateau with long distance views on either side of gentler landscapes is less able to accommodate OHL development. Whereas U-shaped valley sides with semi-natural woodland or conifer plantations with 'fidd' pasture on shallower slopes and valley floors have more capacity to support OHL development.	From desktop study: - Considered the landscape character of this corridor is of medium sensitivity to small scale OHL development. Generally undulating landscape with scattered tree cover offers potential for backgrounding and screening. - Relatively short length of corridor - Low density of scattered properties - No landscape designations. Therefore the landscape would have the capacity to support small scale OHL development, and undergrounding does not seem necessary from a landscape and visual perspective.	No corridor is completely ruled out in terms of landscape character and visual amenity and the overall capacity of the landscape to accommodate smallscale OHL development following this desk based study. The more detailed table on the landscape and visual analysis tab includes more analytical text and uses a traffic light system to highlight where there may be a preference for one corridor over another against each of the landscape and visual factors considered, together with the Holford Rules.	Site visit required to verify desk study and overall conclusions (including further appraisal of Holford Rules considered so far). Consider remaining Holford rules at future stages: - Holford Rule 3: Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers. - Holford Rule 6: Identify existing overhead features (during site visit) - Holford Rule 7: Consider visual amenity of existing and proposed development during site visit and alignment stage		
Landscape													
Designations (Holford Rules 1/2)	None	None	Small part of corridor overlaps with Caeawen Basin RLHI. Likely that route corridor would have to pass through this designation. However gently undulating topography of this part of the designation and woodland cover means this landscape has the capacity to support small scale OHL development despite the historical value.		Corridor bisects the Clywedog Valley RLHI - large section passes through this designation. Mixture of mainly wooded valleys with some areas of open higher ground means this landscape has the capacity to support small scale OHL development despite its historic designation	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor 3 times Generally low density of scattered settlement, however greater density in mid-section of corridor around Y Fan may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor 3 times Generally low density of scattered individual or clusters of properties, however greater density in mid-section of corridor to east of Llandinam may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor once Generally low density of scattered individual or clusters of properties, however greater density in mid-section of corridor to east of Llandinam may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.		None	NCN 8 crosses the corridor in the central region Low concentration of scattered property through the corridor Generally undulating landscape with scattered tree cover offers potential for backgrounding and screening		
Visual amenity/visual receptors (Holford rules 4/5)	No long distance routes/National Trails/NCNs. Clusters of scattered property in mid-section of corridor to west of Carno but at a relatively low density Predominately areas of open undulating upland landscape throughout corridor. Some small linear areas of woodland on valley sides with potential for backgrounding and screening.	No long distance routes/National Trails/NCNs. Low density of scattered settlement throughout the corridor. Predominately areas of high, undulating landscape in north. More potential for backgrounding further south as corridor passes through valleys. Some linear areas of woodland between Coed Pantysgeail and the A470 to provide screening	No long distance routes/National Trails/NCNs. Higher concentration of settlement around Pontfaldlog is a potential constraint. Predominately areas of high, undulating landscape in north. More potential for backgrounding further south as corridor passes through valleys. Some linear areas of woodland between Bwlch Y Garreg and Colwyn Brook to provide screening		Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor 3 times Generally low density of scattered settlement, however greater density in mid-section of corridor around Y Fan may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor once Generally low density of scattered individual or clusters of properties, however greater density in mid-section of corridor to east of Llandinam may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor 3 times Generally low density of scattered individual or clusters of properties, however greater density in mid-section of corridor to east of Llandinam may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.	Glyndwr's Way crosses the corridor in the vicinity of Llandinam. NCR B1 crosses the corridor once Generally low density of scattered individual or clusters of properties, however greater density in mid-section of corridor to east of Llandinam may present a constraint. Undulating topography and woodland cover offer potential for backgrounding and screening.					

Appendix A - Environmental Technical Appraisal

Heritage/ Archaeology	Scheduled Monuments - MG205 Castell Carno. Hillfort; MG231 Bryn y Gadair; Round Cairn	Scheduled Monuments - MG179 Y Capel Stone Circle; Stone Circle; MG278Nant Cwm Gwynn Cairns; Kerf Cairn	Scheduled Monuments - MG180 Ring Cairn 540m SW of Llyn y Tanr; MG275 Carreg Hir Standing Stone Listed Buildings - 17558 Grade II Capel Saron MC with Caretaker's House; and enclosing railings; 17556 Grade II Perth-eyrn; 17567 Grade II Pont-ddi-goch Station and Stationmaster's House; 17552 Grade II Milestone W of village Landscape of Special Historic Interest in Wales - Caeusw Basin HLW(P)5	Slight preference for 1A. While 1A and 1B both have only two designated assets along its route 1C has numerous within 11m of the boundary increasing the potential for previously unrecorded archaeology to be encountered. Second choice would be 1B as its the shortest route and avoids impact into the LSHW.	Scheduled Monuments - MG225 Delgwyden Enclosure; MG082 Pen y Castell; Hillfort; Listed Buildings - 8646 Grade I* Ty Mawr; 7593 Grade II Clangwen; 83244 Grade II Cwm Dylluan; 83241 Grade II Chimney Stack NW of Cwm Dylluan; 83242 Grade II Chimney Stack W of Brynlludw; 83251 Grade II Chimney Stack SW of Brynlludw; 7574 Grade II Glyn Cwyedog; 83247 Grade II Stable and Cart-shed at Glyn Cwyedog Landscape of Special Historic Interest in Wales - Cwyedog Valley HLW(P) 6	Listed Buildings - 17781 Grade II Milestone W of Maesyderyn Lane;	Listed Buildings - 17781 Grade II Milestone W of Maesyderyn Lane;	Scheduled Monuments - RD070 Standing Stone & Round Barrow SE of Heniw (consider as two Sites); RD119 Cwm y Saeson Standing Stone Listed Buildings - 17781 Grade II Milestone W of Maesyderyn Lane;	2b or 3A preferable.	Scheduled Monument -MG267 Domen Glw Cairn. Setting will need assessing	Scheduled Monument -MG267 Domen Glw Cairn. Potential physical impact	No route needs to be completely ruled out at this stage. The shorter the route the lower the potential for encountering assets that would require mitigation. SM can be avoided as can LB.	Site visit required to inform DBA. DBA to be prepared. A Settings Assessment for the SM is likely to be required.
Ecology	Frequent occurrence of ancient woodland, likely peat deposits present across full extent of uppermost section. Edge of Important Curlew Area.	Likely peat deposits present in upper section, including possible scattered areas within the corridor. Combination of frequent stands/ribbons of ancient woodland in the northern section + steep slopes. Frequent high risk bat trees, frequent veteran trees. Wide range of protected species issues including EPS. Likely within Important Curlew Area.	Likely peat deposits present in upper section, including possible scattered areas within the corridor. Combination of frequent stands/ribbons of ancient woodland in the northern section + steep slopes. Frequent high risk bat trees, frequent veteran trees. Wide range of protected species issues including EPS. Within Important Curlew Area. Corridor adjacent to Llyn Mawr SSSI (designated in part for presence of water birds - records of whooper swan from this site) to the west. Another waterbody (Llyn y Tawr) is present to the East with rising ground separating from Llyn Mawr, therefore potential collision risk for birds travelling between these two sites.	Slight preference for 1A - whilst the route is longer, there appear to be less constraints. 1B and 1C have higher density of ancient woodland across the corridor, together with steep topography potentially increasing the risk of impacts to irreplaceable habitat (albeit small scale habitat impacts). Also 1A is towards the edge of Curlew Wales 'Important Curlew Area' - more detailed required to determine if within this strategic ornithological area. 1C is the least preferred option due to presence if important habitats and ornithological risks.	Extensive occurrence of ancient woodland in the southern portion. Within Important Curlew Area. Waterbodies with/adjacent to the corridor (Llyn y Fan) and to the west (Llyn Clewedog), potential bird collision risk. Shortest route.	Presence of ancient woodland but looks avoidable. Within Important Curlew Area.	Combination of frequent stands/ribbons of ancient woodland in the northern section + steep slopes. These habitats appear more frequent in the section to the east of Llyn Ebyr. Frequent high risk bat trees, frequent veteran trees. Wide range of protected species issues including EPS. Within Important Curlew Area. Presence of waterbodies requires consideration of bird collision risk, although arm to the east of Llyn Ebyr is a lower risk.	Coe Craig-lar SSSI – tip of this SSSI falls within/very close to the route corridor (also ancient woodland frequent in this area – careful routing would be required). Within Important Curlew Area.	Slight preference for 2A due to shorter length of route, towards the edge of the Important Curlew Area and terrain likely to be more giving in terms of avoiding impacts to ancient woodland/important habitats. However, caveated by a concern regarding potential bird collision risks due to the presence of large waterbodies (with/nedge of route) and to the east.	Doesn't appear too constrained in terms of designations/protected species. Potential ornithological issues (Important Curlew Area and collision risk - Marsh Pool to the north).	Would give rise to more significant impacts to terrestrial habitats (e.g. hedgerow severance/bar flight lines, disturbance etc - all temporary with mitigation methods available). Potential advantage over OHL in terms of lower impacts to ornithological interests.	In relation to option 4 - no clear preference, if ornithological issues are considered to be significant then undergrounding maybe preferred or a combination of OHL and UG.	Walkover of routes (particularly in terms of assessing feasibility of avoiding ancient woodland) and to further assess extent of peat). More detailed desk study (ornithology), more detailed mapping of constraints (e.g. Important Curlew Areas).
Materials	See notes	See notes	See notes	See notes	See notes	See notes	See notes	See notes	See notes	See notes	See notes	Anticipated that the routes wouldn't alter the assessment as management of potential impacts is governed by a best practice environmental and construction mitigation approach to the design that would reduce the significance potential environmental impact from the consumption of materials and generation of waste. Reduction in Regional Landfill Capacity - Whilst curtil (or re-use v disposal) quantities not known for the routes, the shortest route avoiding potentially contaminated ground (hazardous waste) would be the preference. - Likely to scope out as would have to dispose to landfill significant amounts of what is anticipated to be in the majority "primary soils and stones" to have a significant environmental effect. - Where construction and demolition waste (CDW) and excavation arings generated by the proposed scheme cannot be re-used on the proposed scheme opportunities will be sought to re-use them on other construction projects. Where this is not possible they will be diverted from landfill to another off-site development or sent to an appropriately licenced recovery, treatment and recycling facility. Use of Natural Resources - Route unlikely to influence the assessment unless one route required a significant amount more natural resources than another or that one route required import of significantly more primary aggregates than the other or the use of non-standard construction materials such as Light Weight Aggregates. Reduced to avoid or avoidable impacts on the route as	Baseline needs establishing in the Scoping report.
Groundwater	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater west of Carno. Peat present at the northern extents	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater west of Clatter. Peat present at the northern extents and in the centre	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater southeast of Clatter. Peat present at northern extents and in centre	No preference - overhead lines with wooden poles unlikely to require significant foundation works.	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater at its northern extents (near Trefleghys) and in centre of route (east of Llandides)	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater at its northern extents (near Trefleghys) and in centre of route (east of Llandides)	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater at its northern extents (near Trefleghys) and in centre of route (east of Llandides)	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Route crosses superficial deposits likely to hold groundwater at its northern extents (near Trefleghys) and in centre of route (east of Llandides)	No preference - overhead lines with wooden poles unlikely to require significant foundation works.	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Isolated pockets of peat deposits present - may be associated with shallow groundwater.	Bedrock geology associated with Secondary A, Secondary B and secondary undifferentiated bedrock aquifers. Isolated pockets of peat deposits present - may be associated with shallow groundwater.	Overhead line between Banc Du and Rhiwas (Corridor 4) would avoid construction pollution risks and long term groundwater diversion risks to any groundwater receptors of the secondary aquifers (such as local private water supplies or groundwater dependent terrestrial ecosystems).	Ground investigation would be required for underground cable between Banc Dun and Rhiwas. Interception of peat would require peat assessment. Any control of groundwater during construction (for underground cabling) may be subject to an abstraction licence.
Surface Water	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are four locations to the centre and one to the south of the corridor where it crosses a zone with medium to high risk of flooding from rivers. No main river crossing Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events No lakes	Majority of this corridor lies within a zone of low risk of flooding from rivers. There is one locations to the centre of the corridor where it crosses a zone with medium to high risk of flooding from rivers. One main river crossing Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events No lakes	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are four locations, two to the north and two to the south of the corridor where it crosses a zone with medium to high risk of flooding from rivers. One main river crossing Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events No lakes	1B encroaches on the smallest area that is at high risk of river flooding.	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are five locations across the corridor where it will have to cross a zone with medium to high risk of flooding from rivers. Medium to high risk flood zones cover a large area (approximately 2.7 km ²) local to Trefleghys. Three main river crossings Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events Flood defences located along the main river local to Trefleghys. No lakes	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are six locations across the corridor where it will have to cross a zone with medium to high risk of flooding from rivers. Medium to high risk flood zones cover a large area (approximately 2.7 km ²) local to Trefleghys. Three main river crossings Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events Flood defences located along the main river local to Trefleghys. No lakes	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are seven locations across the corridor where it will have to cross a zone with medium to high risk of flooding from rivers. Medium to high risk flood zones cover a large area (approximately 2.7 km ²) local to Trefleghys. In addition to this a zone with medium to high risk runs through the centre of the southern section for approximately 3 km. Three main river crossings Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events Flood defences located along the main river local to Trefleghys. No lakes	Majority of this corridor lies within a zone of low risk of flooding from rivers. There are seven locations across the corridor where it will have to cross a zone with medium to high risk of flooding from rivers. Medium to high risk flood zones cover a large area (approximately 2.7 km ²) local to Trefleghys. In addition to this a zone with medium to high risk runs through the centre of the southern section for approximately 3 km. Three main river crossings Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events Flood defences located along the main river local to Trefleghys. No lakes	No preference, they all pose a similar level of risk.	All of this corridor lies within an area of low risk of flooding from rivers. No river crossing Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events No lakes	All of this corridor lies within an area of low risk of flooding from rivers. No river crossing Multiple instances of low to high risk of flooding from surface water across the corridor. No historic flood events No lakes	They all pose a similar level or risk associated with flood risk. However there is one route which encroaches a smaller area of high flood risk from rivers in one run. Principal risk is associated with construction rather than operation.	Any works in, over or next to a main river or its floodplain, or an ordinary watercourse may require permits and consents. Flood Risk Assessment is highly unlikely to require modelling input.
Noise and Vibration	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Plas Llynn	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Clatter	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Clatter and Pontdolgich.	Of the three corridors under consideration the western 1(A) and the central 1(B) appear to have the least amount of noise sensitive receptors nearby/within the area under consideration. Although we cannot directly state a preference which corridor would be best in noise terms - we can advise that based on our observations the eastern corridor would not be our preference.	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Trefleghys, Van, Glyn-Y-Nant. The corridor also runs in close proximity to the Trannon Caravan Park	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Trefleghys, Oakley Park, Dolwen, Hillfield (S of Llandides) The corridor also runs in proximity to the Trannon Caravan Park (further away than 2A), Oakley Park Chapel, Caeau Caravan Park, Woodland Caravan Park, Newchapel Baptist Church, Schools south of Hillfield	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Trefleghys, Oakley Park, Dolwen, Cumbelman The corridor also runs in proximity to the Trannon Caravan Park (further away than 2A), Oakley Park Chapel, Caeau Caravan Park, Woodland Caravan Park, Newchapel Baptist Church.	There are a number of noise sensitive receptors located within and adjacent to the proposed corridor area. The majority of these are isolated single properties, however the corridor also passes, to larger settlement areas such as Trefleghys, Oakley Park, Dolwen. The corridor also runs in proximity to the Trannon Caravan Park (further away than 2A), Oakley Park Chapel, Caeau Caravan Park, Woodland Caravan Park, Newchapel Baptist Church.	From visual inspection, between 2A and 2B, the corridor 2A appears to pass through/very less noise sensitive receptors.	There is a low possibility of operational noise from OHL, at noise sensitive receptors (depending on proximity based on the final proposed OHL alignment).	The construction of an underground cable corridor (either open cut or HDO) can be a noisy process and depending on proximity to noise sensitive receptors noise mitigation may be needed.	As well as towns and villages, the indicated routes frequently pass single, isolated properties in (and around) each of the proposed corridors. Any routing that is considered should maintain a reasonable distance from them (where possible) to minimise potential noise effects from either construction or operational noise (assuming OHL).	Depending on the final selected corridors and the alignments within them (plus any temporary haul routes within the areas), a further assessment to identify if there are any noise sensitive receptors within 300m (for construction noise) of those proposed routes is recommended. The results of this would indicate if a more formal assessment would be needed

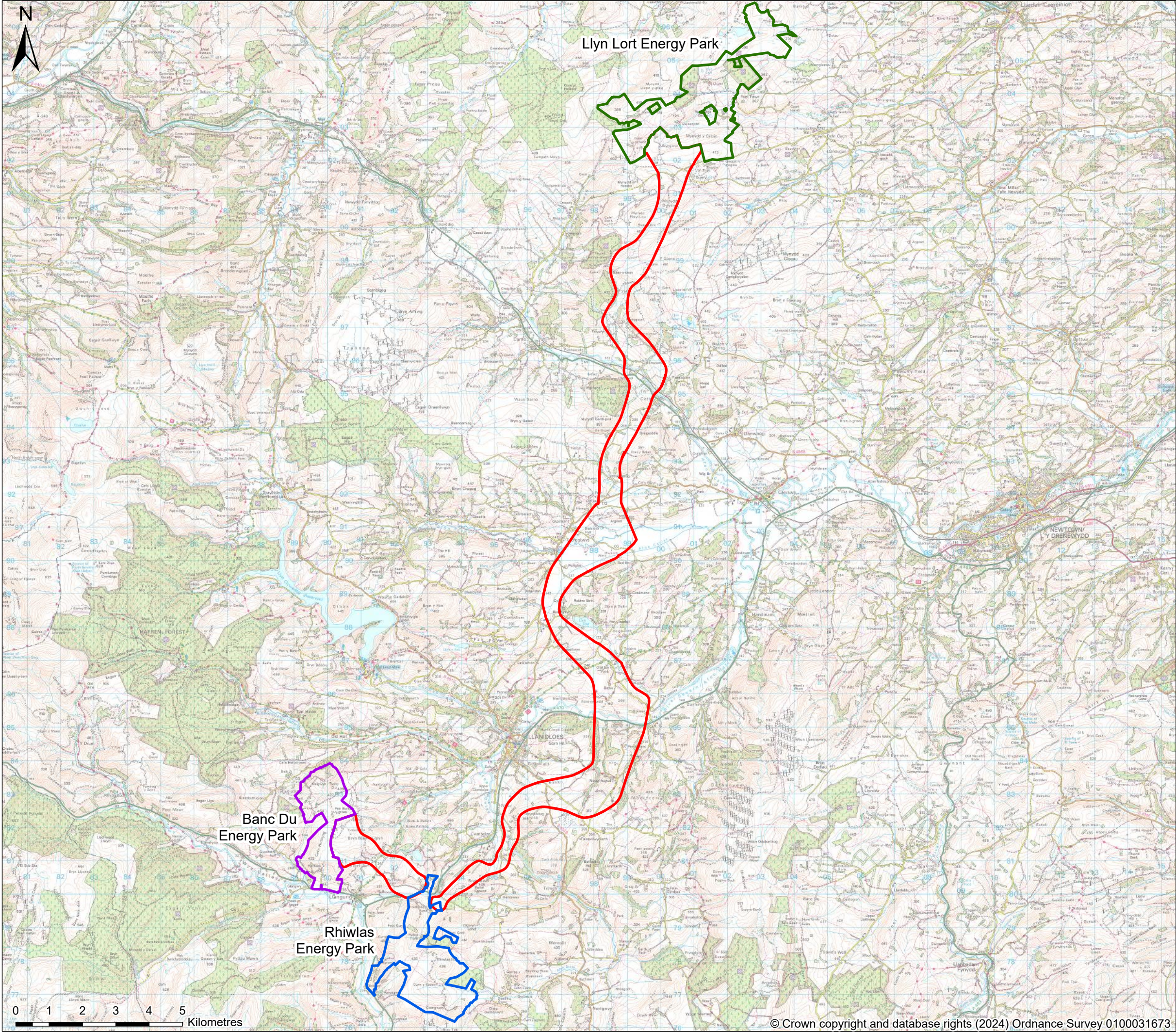
Appendix B Green GEN Cymru Technical Appraisal

Topic	Consideration	Route Option 1A	Route Option 1B	Route Option 1C	Preference
Design and Construction Considerations	Route Length	12km	10km	12km	1B is shorter in length than 1A and 1B . This would result in a significant difference in cost in comparison to 1A and 1C . Therefore, 1B is preferred.
	Changes in Direction	10	8	12	The preference would be 1B as there are less changes in direction and therefore less machine sites
	Use of Angle Poles	1B will have less changes in direction than the other 2			
	Access	Access to the middle of all 3 routes can be gained from the A489 The remainder of the roads in the area are unsuitable for transporting heavy materials and equipment such as puller/tensioner machines, excavators and conductor drums			There is no preference between 1A , 1B and 1C based on access from the public highway.
	Access to the site roads from the public highway.				
	Terrain	The terrain would be described as rolling, so there would be no major issues with siting poles	While a little more hilly than 1A north of the A470 between Carno and Clatter there are still no major issues	The area just north and south of the A470 near Clatter is more hilly than option 1A , however could still be built with no major issues	There is a slight preference for route 1A
	Obstacles	No major Obstacles			No preference of options
	Wind Turbines	There are no current issues within the route options in regards to proximity to wind turbines.			No preference of options
	Proximity to Wind Turbines				
	Woodland	There are no significant issues within the route options in regards to woodland present within the route.			No preference of options
Third Party Services	There is nothing known of any significance in regards to third party services.			No preference of options	
Technical Preference	There will be access challenges with all 3 of these options so the major factor from the perspective of Design, Engineering and Cost would be the fact that 1B is the shorter route and therefore least expensive.				

Topic	Consideration	Route Option 2A	Route Option 2B	Route Option 3A	Route Option 3B	Preference
Design and Construction Considerations	Route Length	13.5km	17km	5km	10km	2A is shorter in length than 2B , 2B/3A or 2B/3B . This would result in a significant difference in cost in comparison. Therefore, 2A is preferred.
	Changes In Direction Use of Angle Poles.	8	10	5	7	The preference would be 2A as there are less changes in direction and therefore less machine sites.
	Access Access to the site roads from the public highway.	2A follows the B4569 until it passes Y Fan when it follows the cycle route which would be unsuitable for transporting heavy materials such as puller tensioner machines, excavators and conductor drums.	The North Western leg of 2B closely follows the B4569 down to the A470 the North Eastern leg skirts East of the llyn Ebyr (Ebyr Lake) with no suitable roads. 2B then goes south around Llandiloes before crossing the A470 again, up to this point the access from the B4569 and A470 would be good. It the heads West near unsuitable roads.	3A follows the A470 from the point 2B crosses it before heading West so has good access.	3B heads South from Llandiloes near the B4518 which gives good access, it then heads South West near unsuitable roads.	The preference would be to start at trfegwys on 2A , then follow 2B then 3A all of which give the best access to the better road network mainly the B4569 and the A470.
	Terrain	The terrain would be described as hilly but with no major issues for siting poles.				There is no preference with regard to Terrain.
	Obstacles	No major Obstacles.				No Preference.

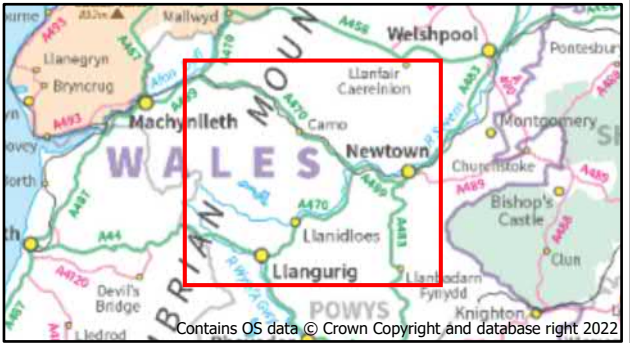
Topic	Consideration	Route Option 2A	Route Option 2B	Route Option 3A	Route Option 3B	Preference
	Wind Turbines Proximity to Wind Turbines	There are no current issues within the route options in regards to proximity to wind turbines.				No Preference
	Woodland	There are no significant issues within the route options in regards to woodland present within the route.				No Preference
	Third Party Services	There is nothing known of any significance in regards to third party services.				No preference
	Technical Preference	Route 2A while being the shortest would have the most difficulties with regard to access. Technically the best route would be a mixture of the corridors as follows;- Start at Trfeglwys on 2A, then follow 2B then 3A.				

Appendix B

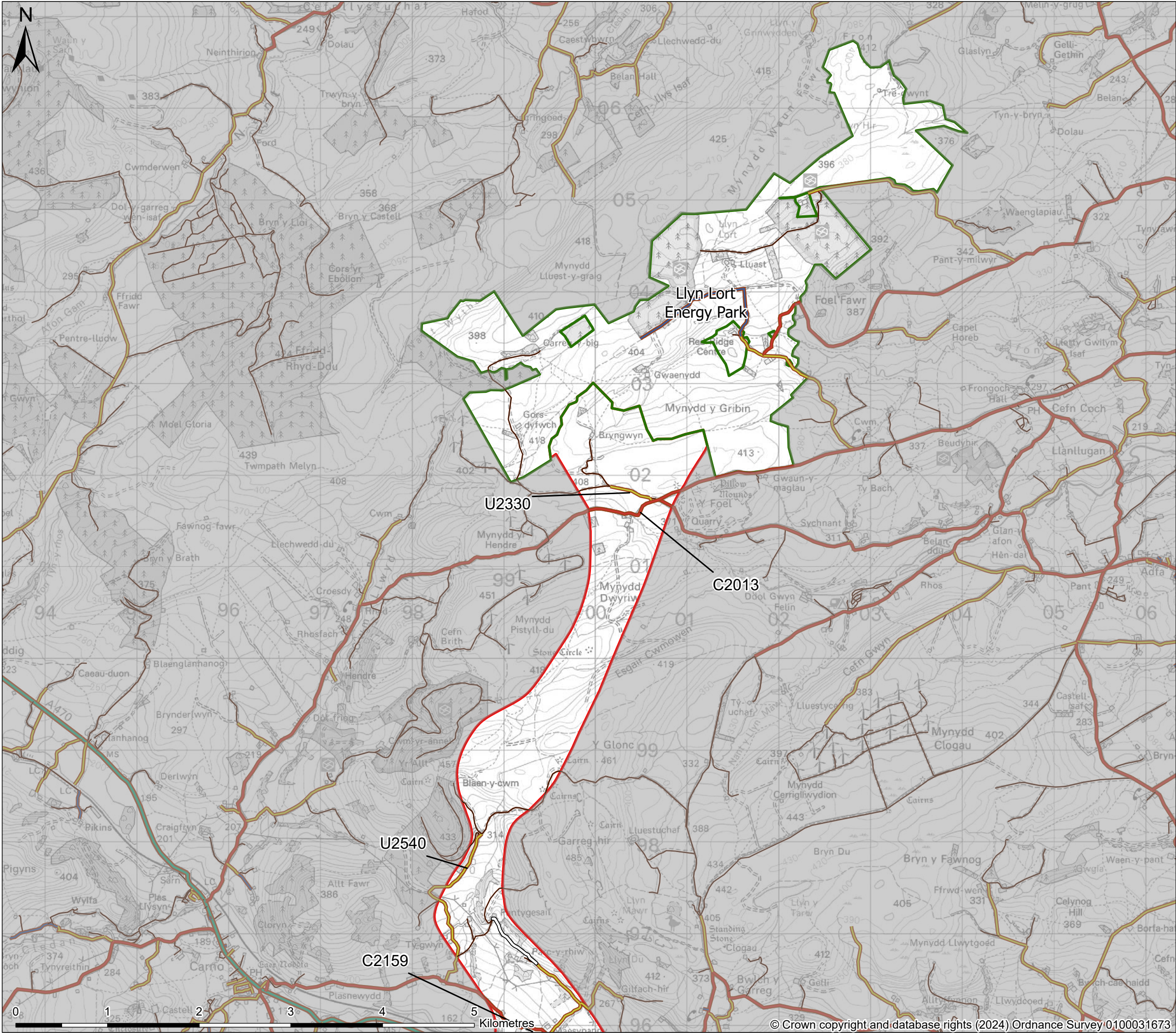


Legend

- Scoping Corridor
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park



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FIGURE 1.1 - SITE LOCATION PLAN					
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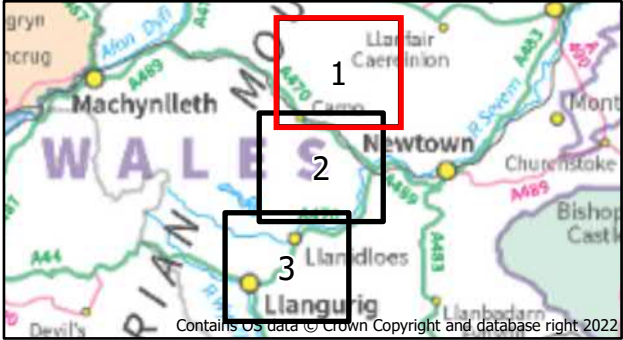
Legend

- Scoping Corridor
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

Road Class

- A Road
- B Road
- Classified Unnumbered
- Unclassified
- Private
- Not Classified
- Unknown

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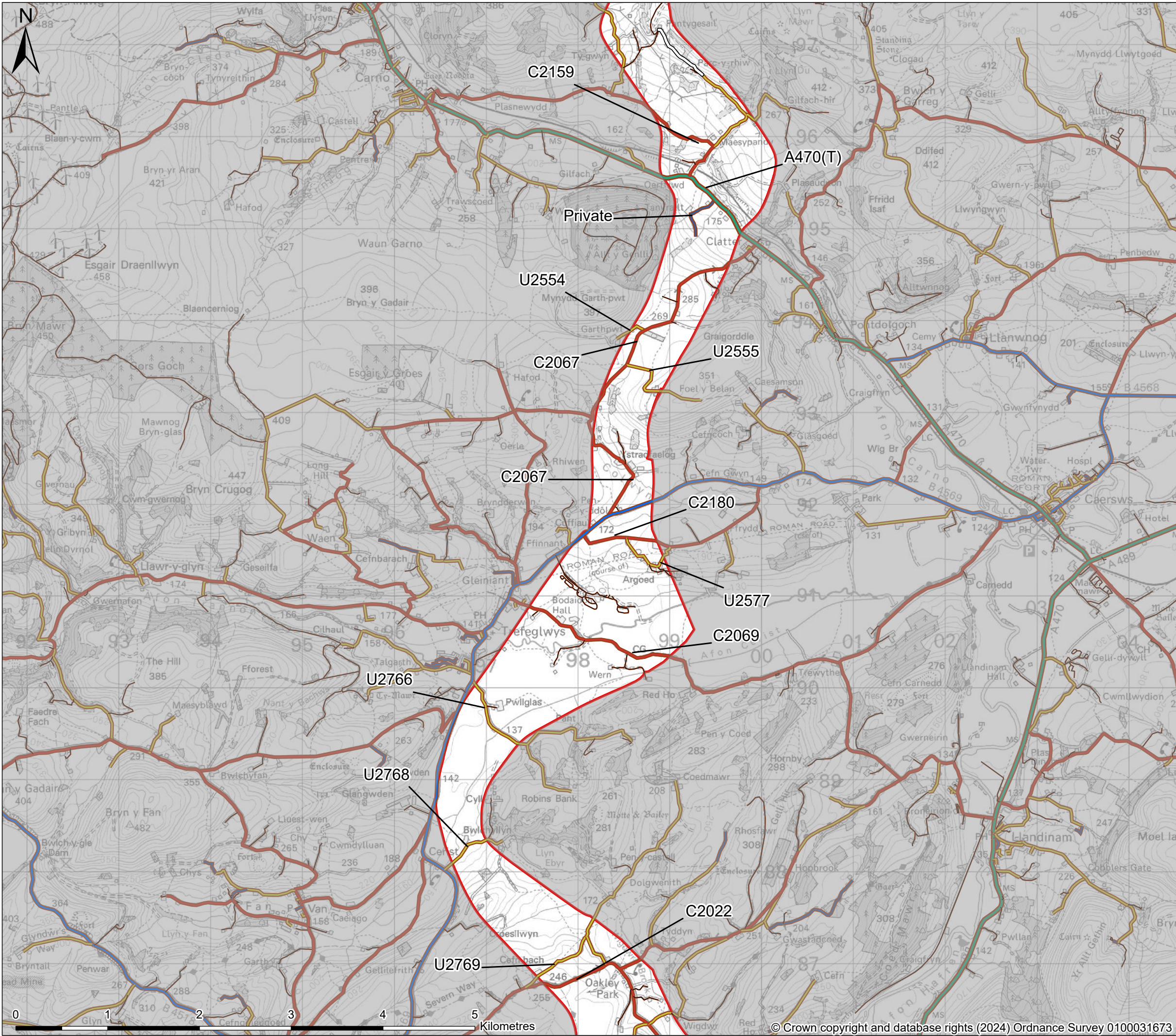
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FIGURE 4.1: TRANSPORT STUDY AREA

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Legend

- Scoping Corridor
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

Road Class

- A Road
- B Road
- Classified Unnumbered
- Unclassified
- Private
- Not Classified
- Unknown

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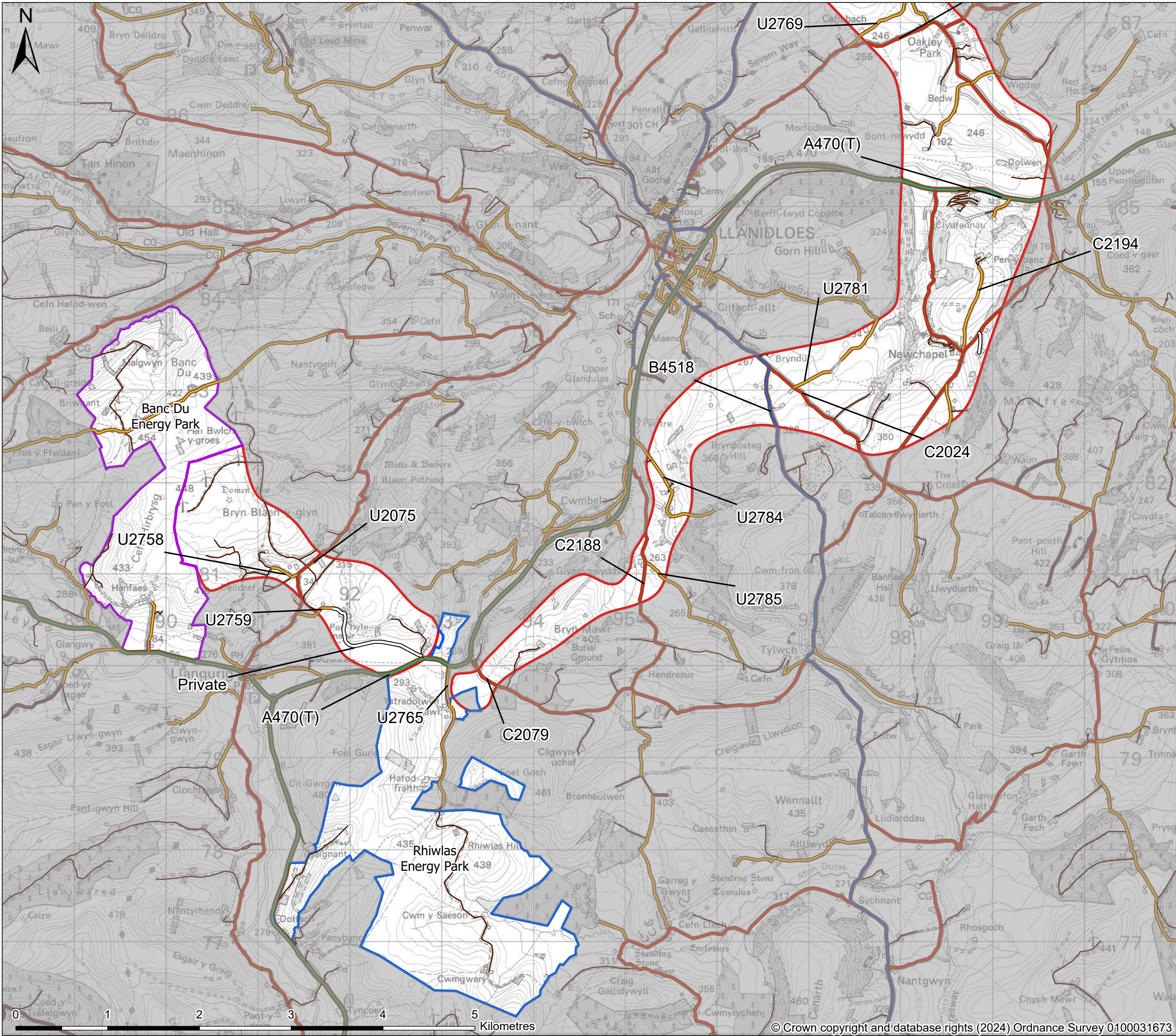
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FIGURE 4.1: TRANSPORT STUDY AREA

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Legend

Scoping Corridor

Banc Du Energy Park

Rhiwlas Energy Park

Llyn Lort Energy Park

Road Class

A Road

B Road

Classified Unnumbered

Unclassified

Private

Not Classified

Unknown

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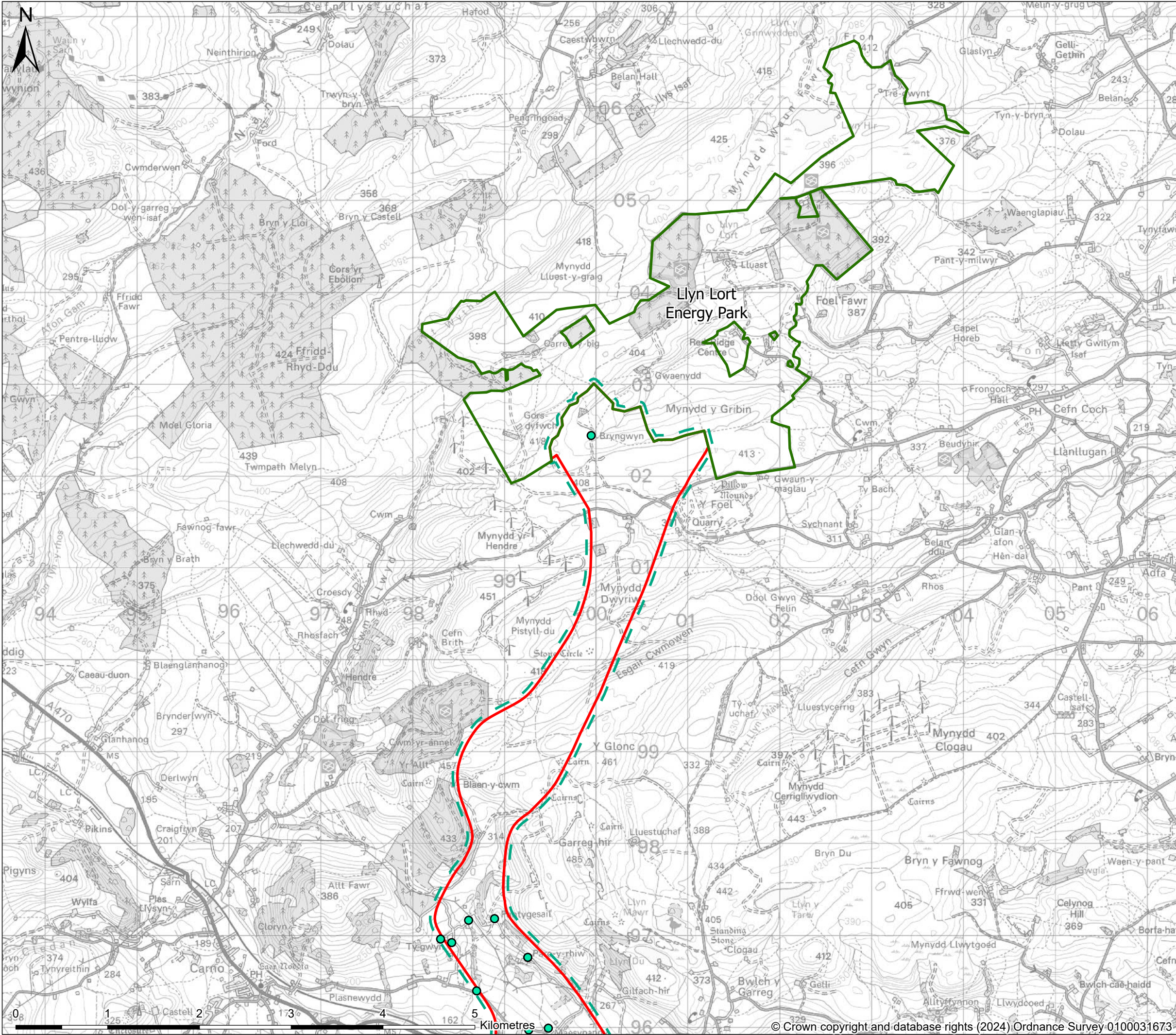
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FIGURE 4.1: TRANSPORT STUDY AREA

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Legend

Scoping Corridor

Banc Du Energy Park

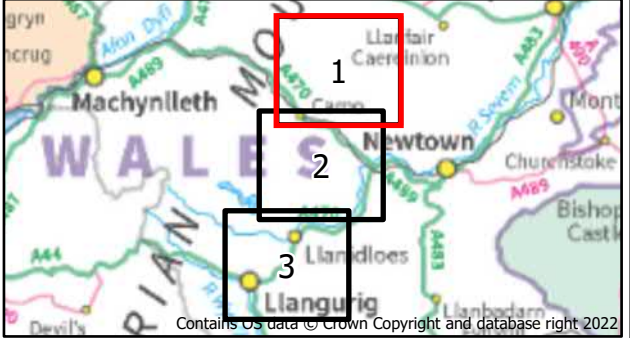
Rhiwlas Energy Park

Llyn Lort Energy Park

Sensitive Receptors within 50m

50m Construction Dust Buffer

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Drawing Title

FIGURE 5.1: SENSITIVE RECEPTORS WITHIN 250M
OF THE SCOPING REPORT CORRIDOR
SHEET 1 OF 3

Sheet Size

A3

Scale

1:40,000

Sweco Ref

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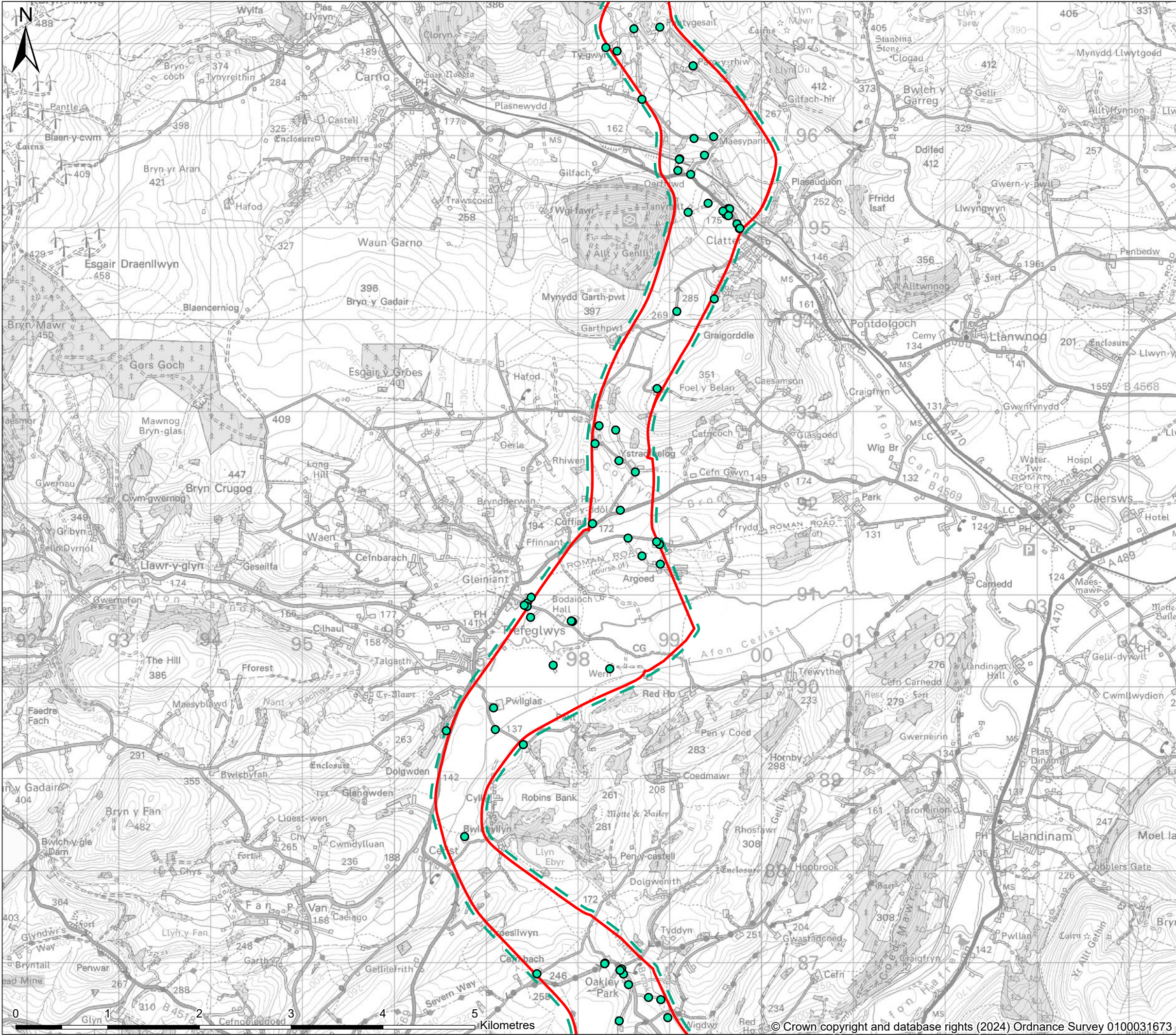
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Legend

Scoping Corridor

Banc Du Energy Park

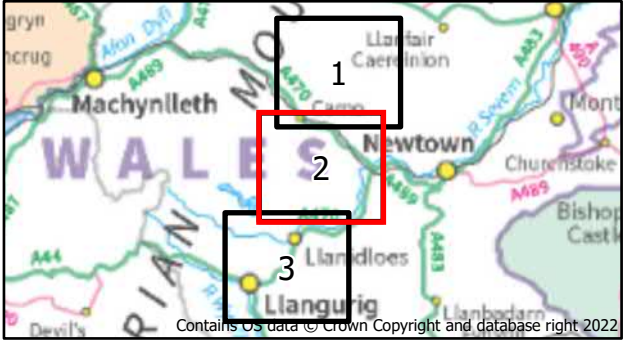
Rhiwlas Energy Park

Llyn Lort Energy Park

Sensitive Receptors within 50m

50m Construction Dust Buffer

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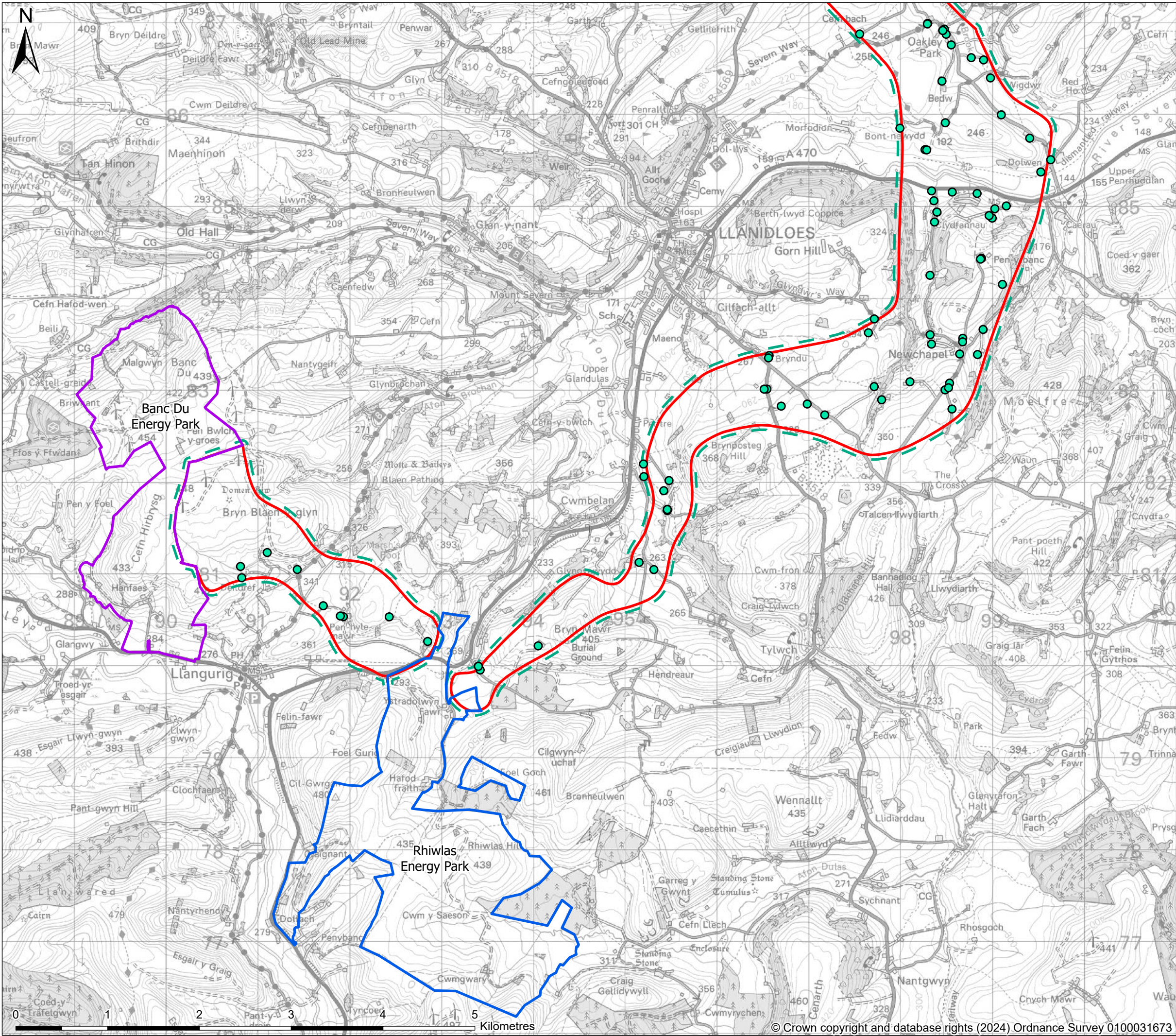
FIGURE 5.1: SENSITIVE RECEPTORS WITHIN 250M OF THE SCOPING REPORT CORRIDOR
SHEET 2 OF 3

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Drawing Number

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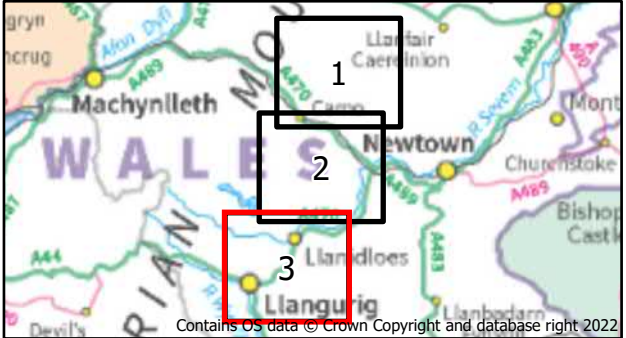
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Legend

- Scoping Corridor
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park
- Sensitive Receptors within 50m
- 50m Construction Dust Buffer

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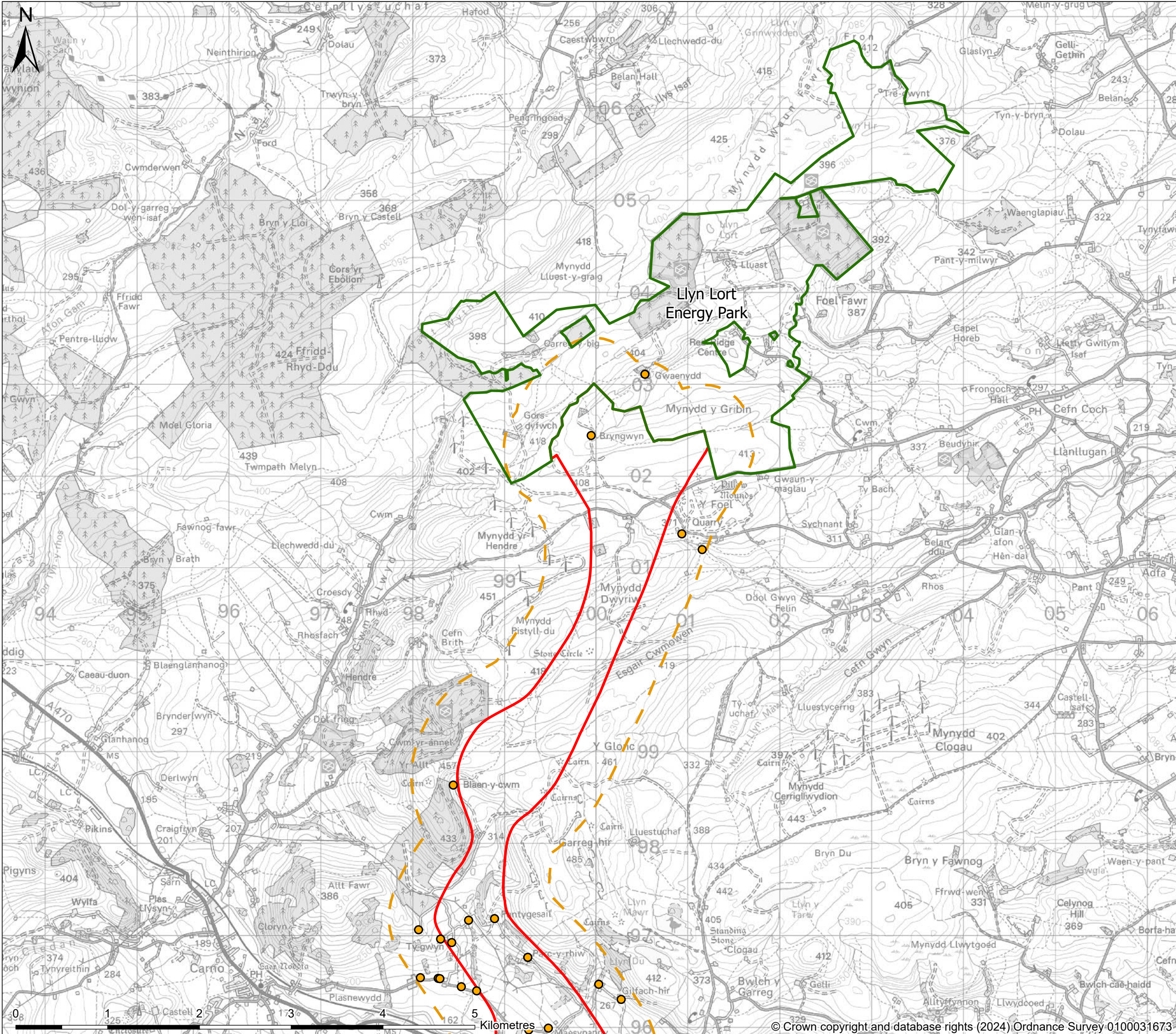
Client
GREEN GEN CYMRU

Project
BANC DU RHIWLAS GRID CONNECTION

Drawing Title
FIGURE 5.1: SENSITIVE RECEPTORS WITHIN 250M OF THE SCOPING REPORT CORRIDOR SHEET 3 OF 3

Sheet Size	A3	Scale	1:40,000	Sweco Ref	65208073	Revision	P01
Drawing Number	65208073-SWE-XX-XX-D-AQ-0001						

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Legend

Scoping Corridor

Banc Du Energy Park

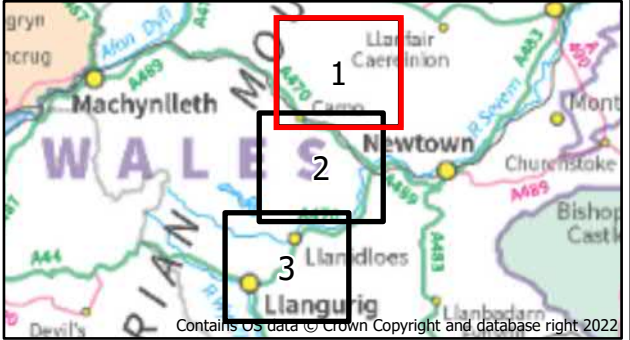
Rhiwlas Energy Park

Llyn Lort Energy Park

Sensitive Receptors within 250m

250m Construction Dust Buffer

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FIGURE 5.2: SENSITIVE RECEPTORS WITHIN 50M OF THE SCOPING REPORT CORRIDOR
SHEET 1 OF 3

Sheet Size

A3

Scale

1:40,000

Sweco Ref

65208073

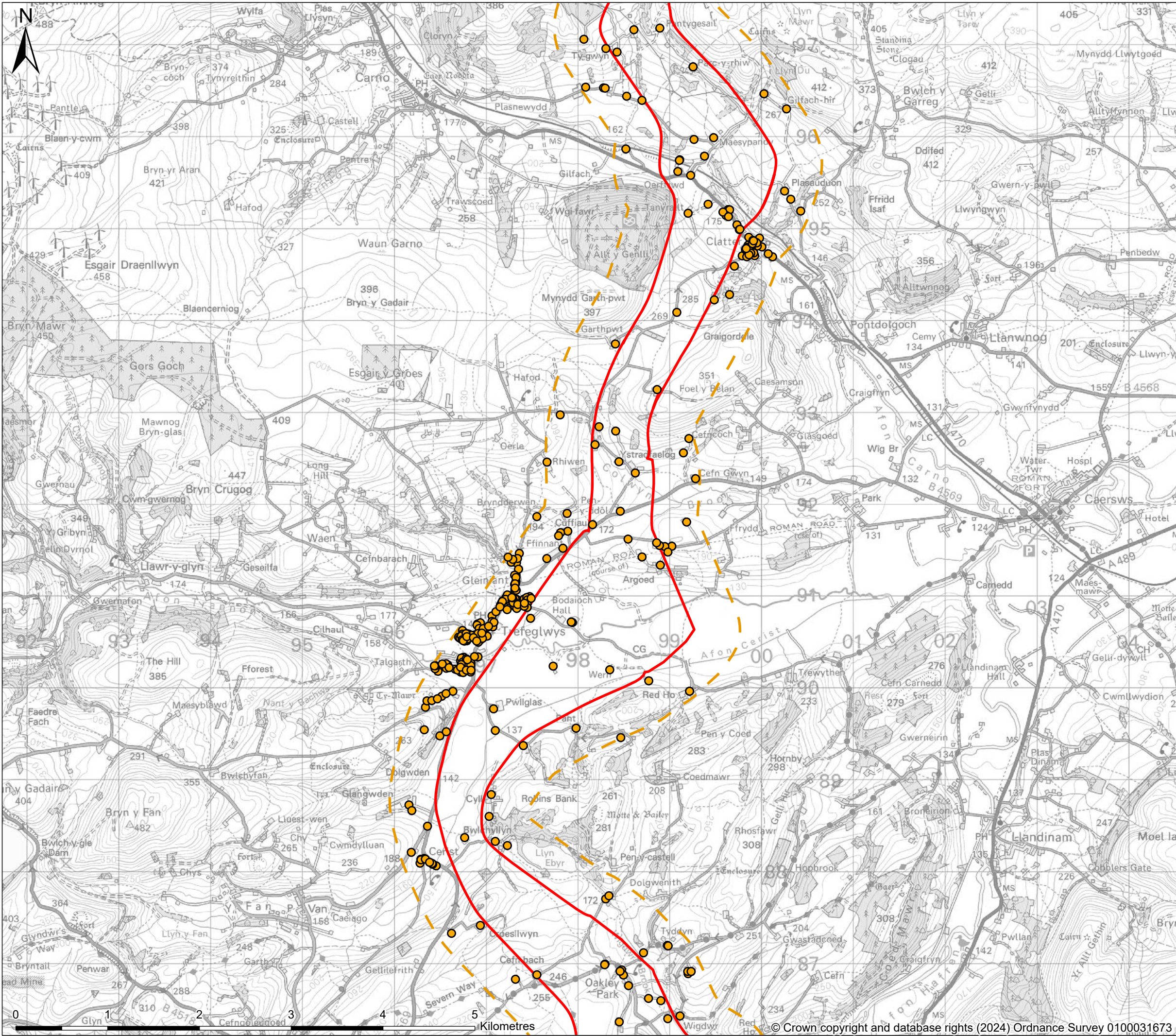
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Legend

Scoping Corridor

Banc Du Energy Park

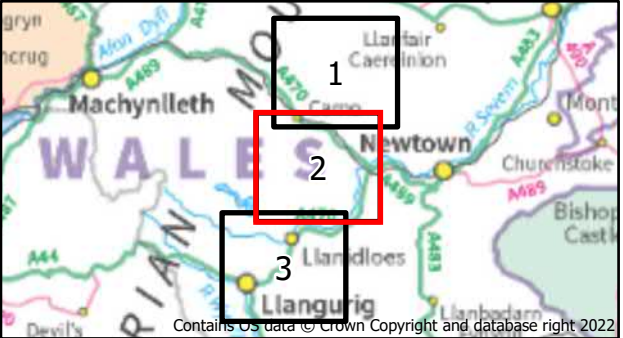
Rhiwlas Energy Park

Llyn Lort Energy Park

Sensitive Receptors within 250m

250m Construction Dust Buffer

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Drawing Title

FIGURE 5.2: SENSITIVE RECEPTORS WITHIN 50M OF THE SCOPING REPORT CORRIDOR
SHEET 2 OF 3

Sheet Size

A3

Scale

1:40,000

Sweco Ref

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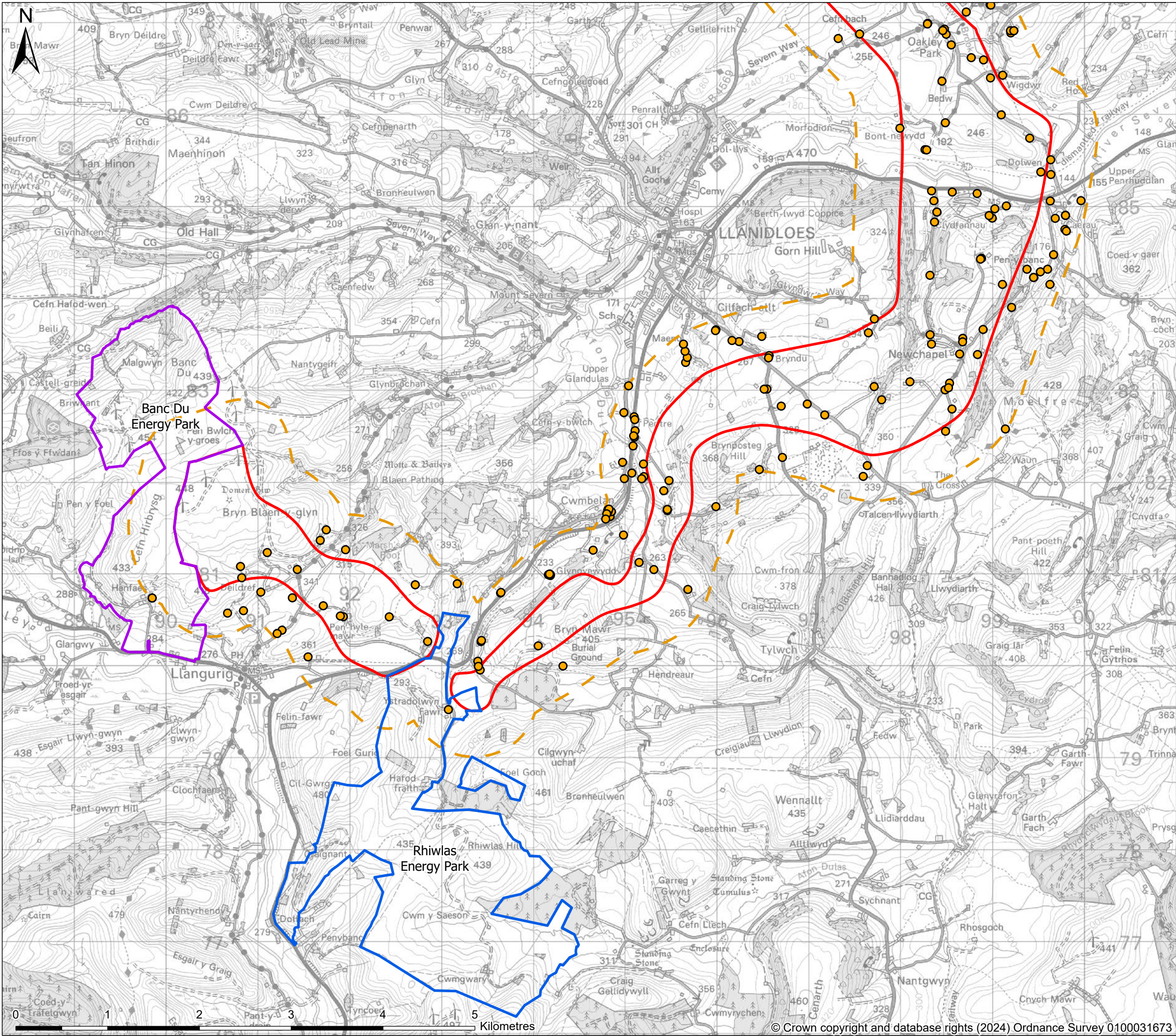
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Drawing Number

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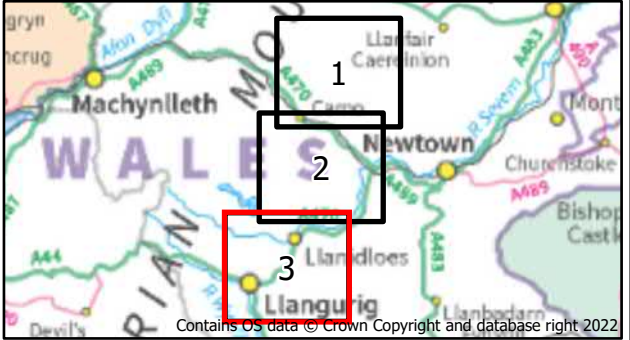
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Legend

- Scoping Corridor
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park
- Sensitive Receptors within 250m
- 250m Construction Dust Buffer

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BANC DU RHIWLAS GRID CONNECTION

Drawing Title

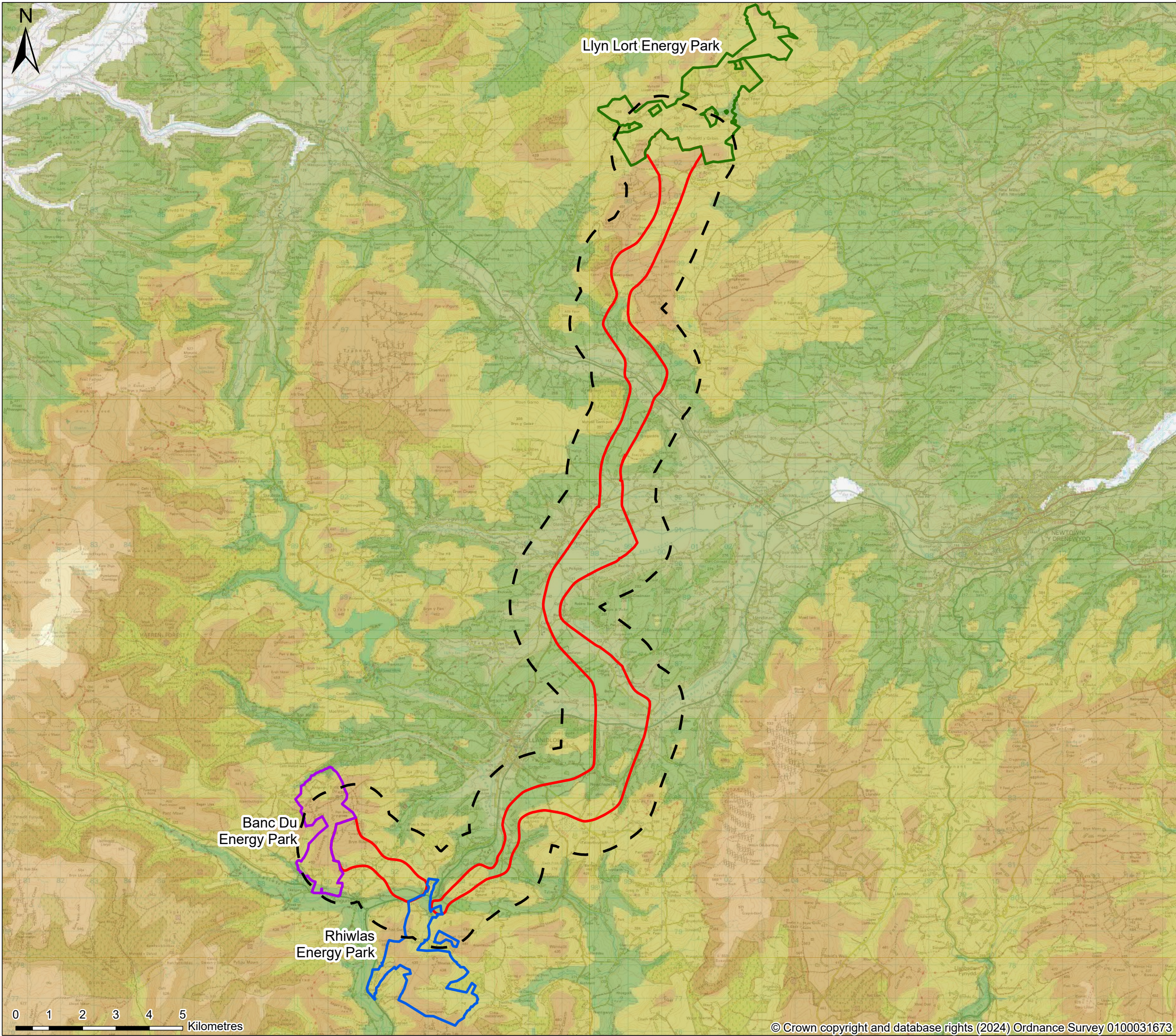
FIGURE 5.2: SENSITIVE RECEPTORS WITHIN 50M OF THE SCOPING REPORT CORRIDOR SHEET 3 OF 3

Sheet Size	Scale	Sweco Ref	Revision
A3	1:40,000	65208073	P01

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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

Elevation (m) above Ordnance Datum

- 16 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 601 - 700
- 701 - 800

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BANC DU RHIWLAS GRID CONNECTION

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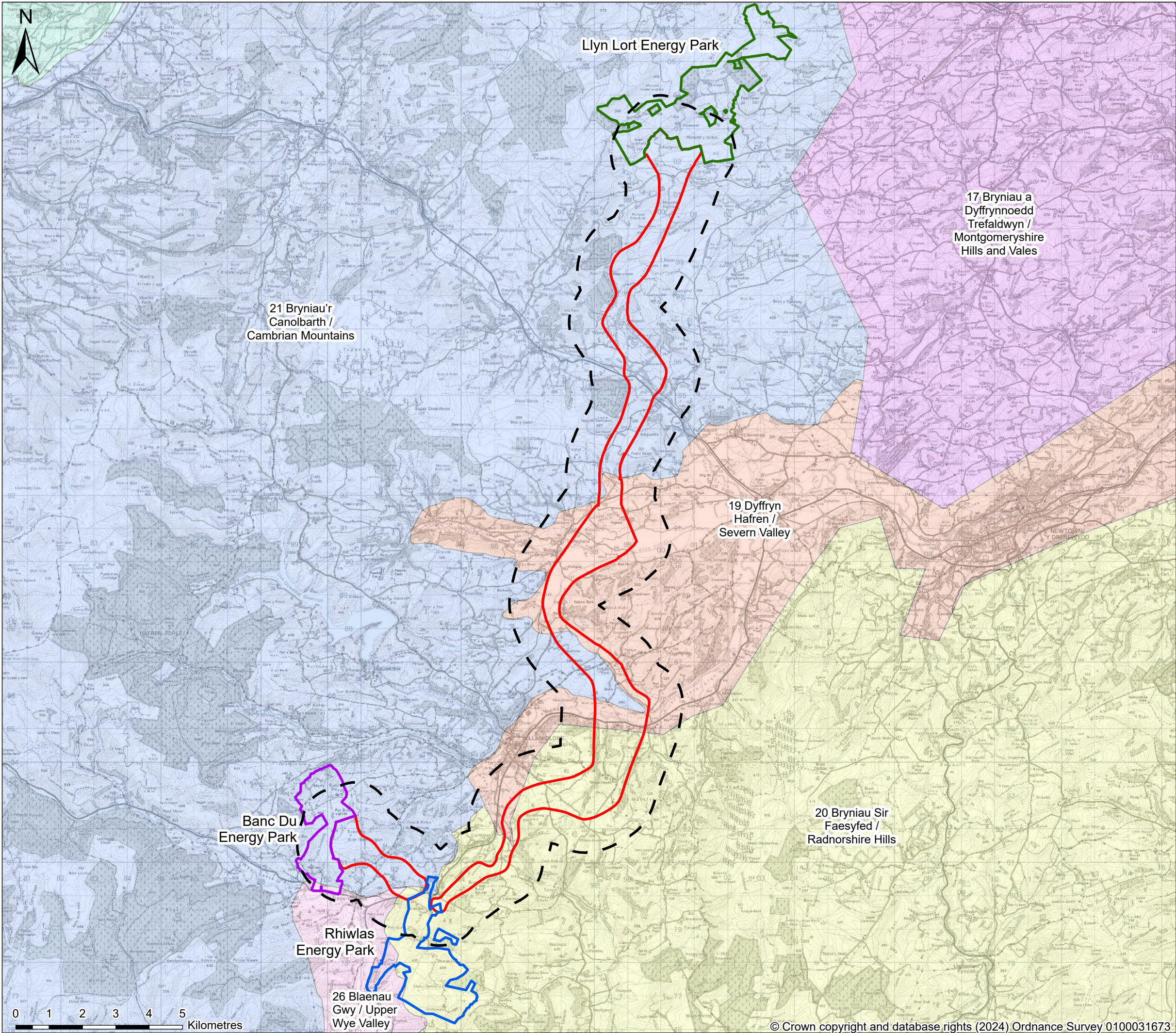
FIGURE 8.1 - STUDY AREA WITH ELEVATION

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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

National Landscape Character Area

- 06 Eryri (Snowdonia)
- 17 Bryniau a Dyffrynnoedd Trefaldwyn / Montgomeryshire Hills and Vales
- 19 Dyffryn Hafren / Severn Valley
- 20 Bryniau Sir Faesyfed / Radnorshire Hills
- 21 Bryniau'r Canolbarth / Cambrian Mountains
- 26 Blaenau Gwy / Upper Wye Valley

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FIGURE 8.2 - NATIONAL LANDSCAPE CHARACTER AREA

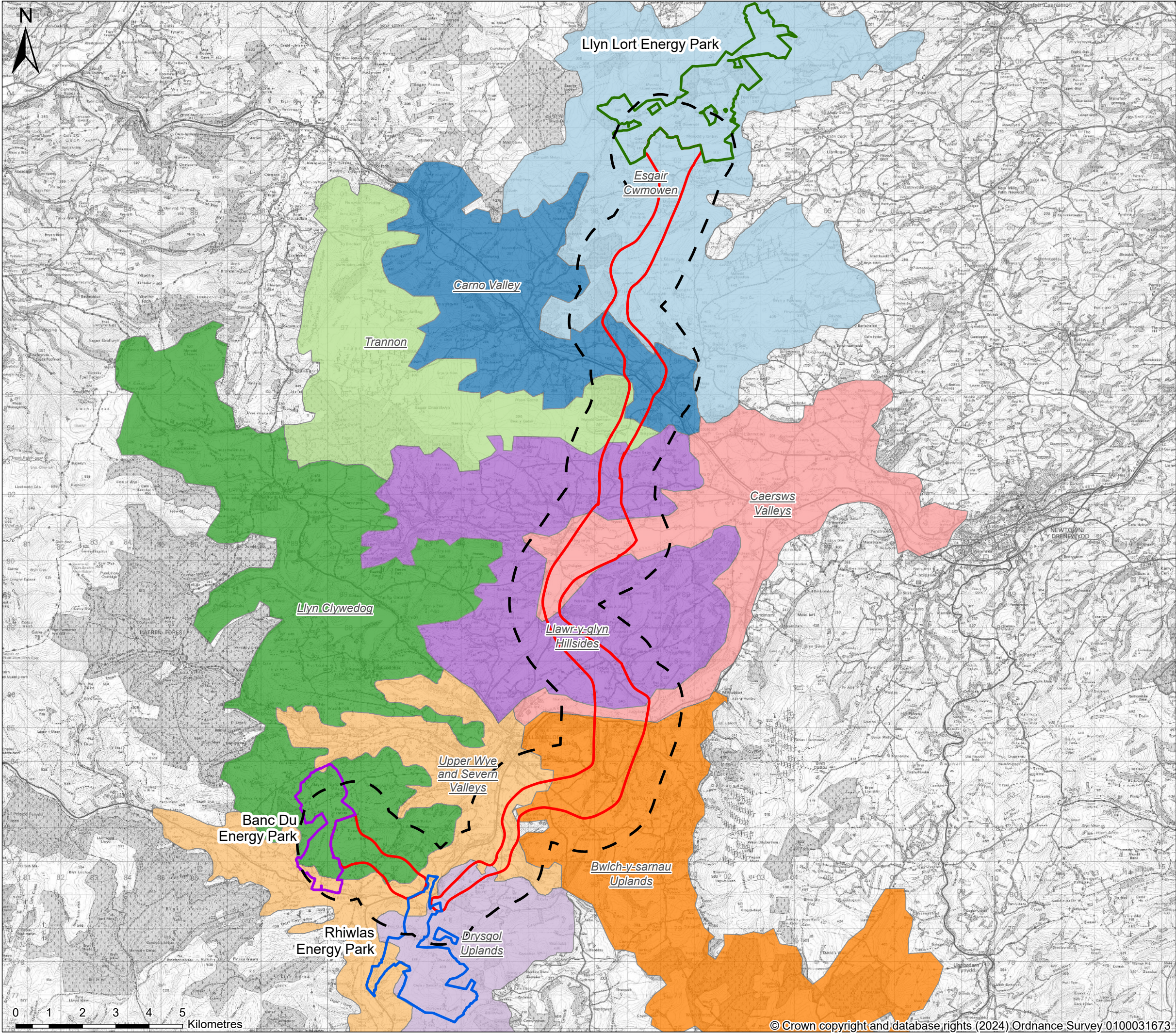
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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

Powys Landscape Character Assessment (2021)

- 17: Esgair Cwmowen
- 19: Carno Valley
- 20: Trannon
- 23: Llyn Clywedog
- 25: Caersws Valleys
- 26: Llawr-y-glyn Hillsides
- 30: Upper Wye and Severn Valleys
- 31: Bwlch-y-sarnau Uplands
- 37: Drysgol Uplands

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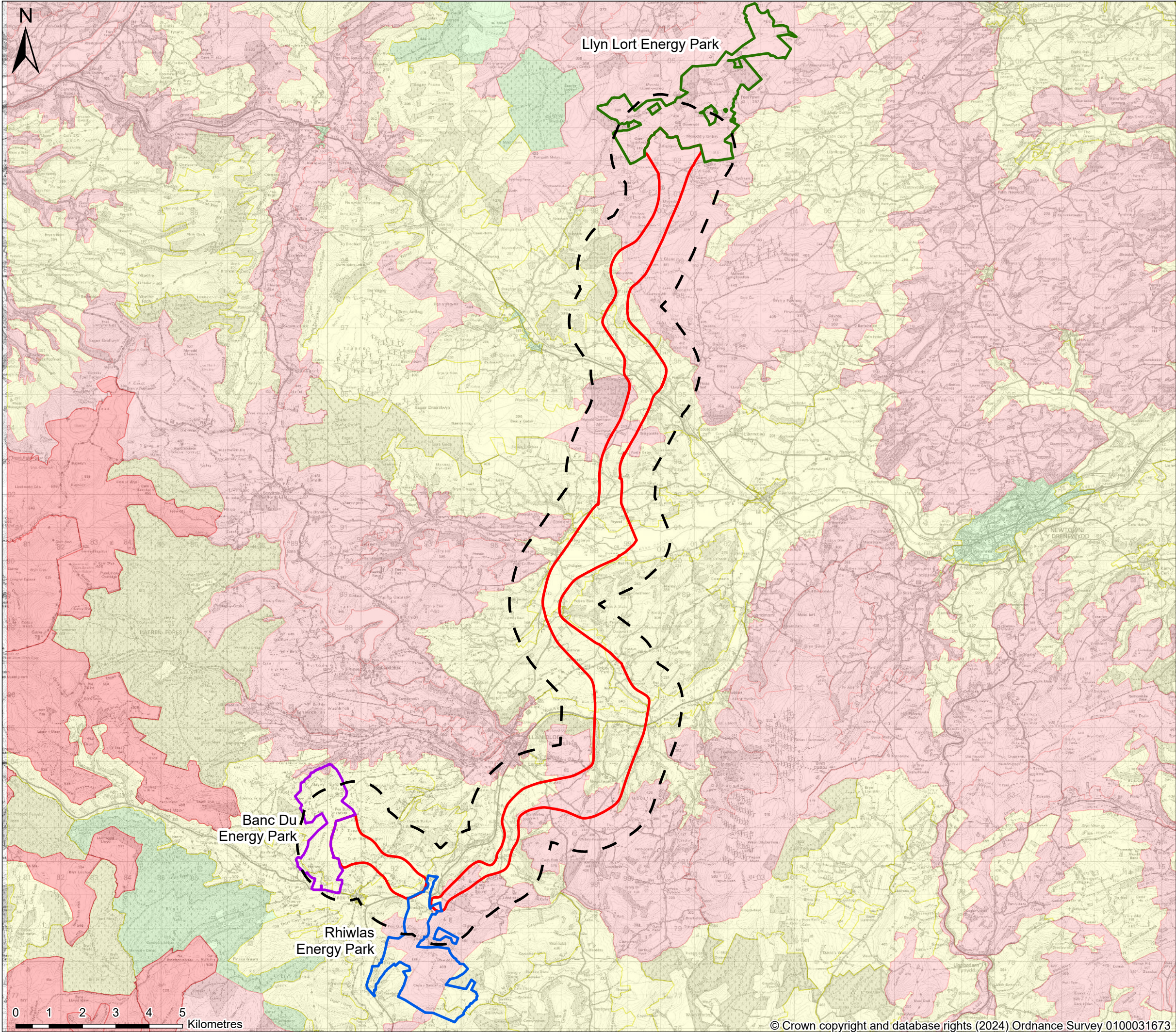
Project
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Drawing Title
FIGURE 8.3 - POWYS LANDSCAPE CHARACTER ASSESSMENT

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Drawing Number
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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park

LandMap Visual and Sensory (VS 50)

- Outstanding
- High
- Moderate
- Low

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FIGURE 8.4 - LANDMAP VISUAL AND SENSORY (VS 50)

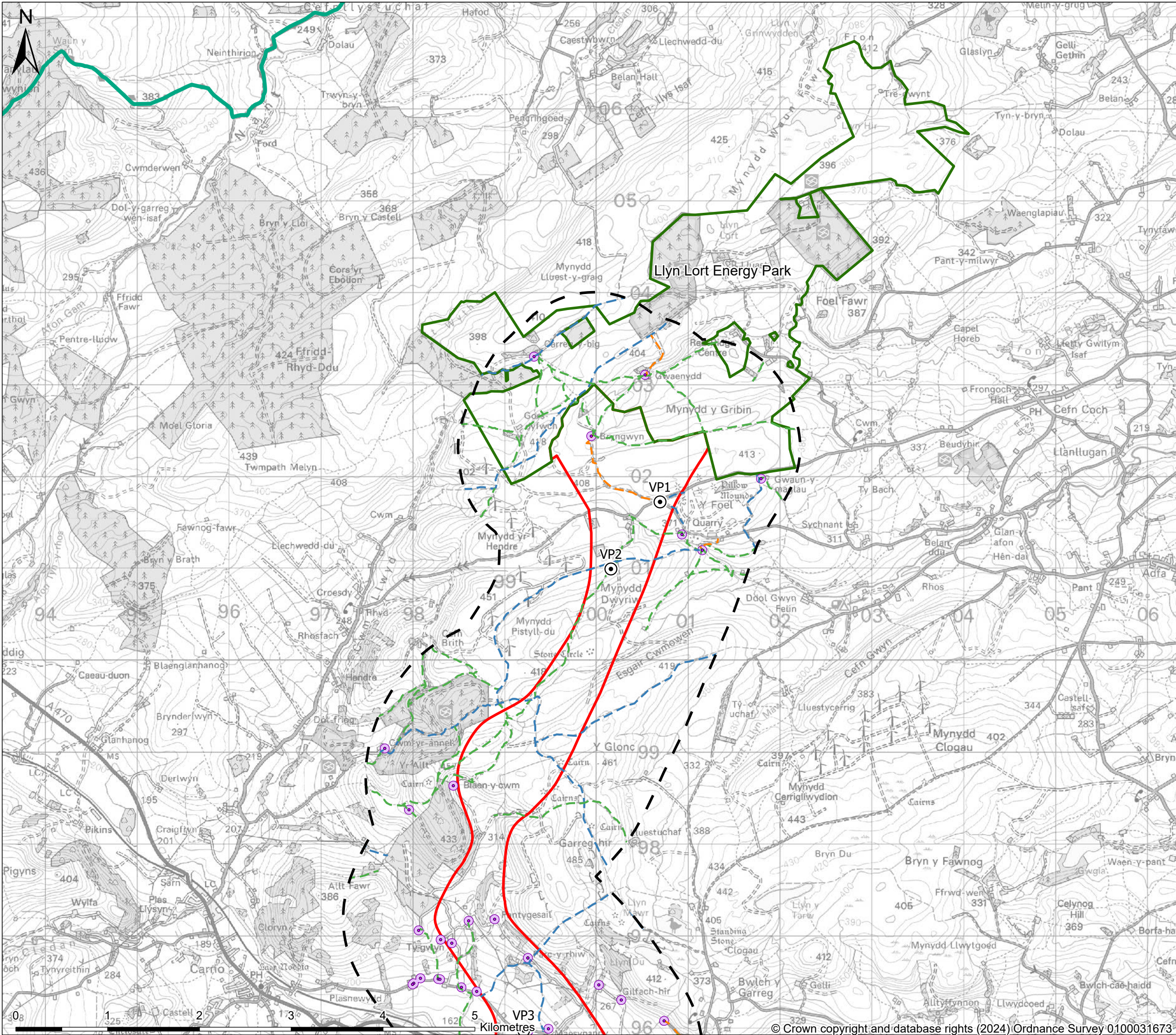
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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Llyn Lort Energy Park
- Banc Du Energy Park
- Rhiwlas Energy Park
- Residential Receptor
- Residential Receptor 50m Buffer
- National Cycle Network (NCN)
- National Trail

Public Rights of Way

- BOAT
- Bridleway
- Footpath
- Public Road
- Restricted Byway

Representative Viewpoints

- VP1 : South of Llyn Lort Energy Park
- VP2 : North of Y Capel Stone Circle Scheduled Monument
- VP3 : Maesypany

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Drawing Title

FIGURE 8.5 - VISUAL RECEPTORS
SHEET 1 OF 3

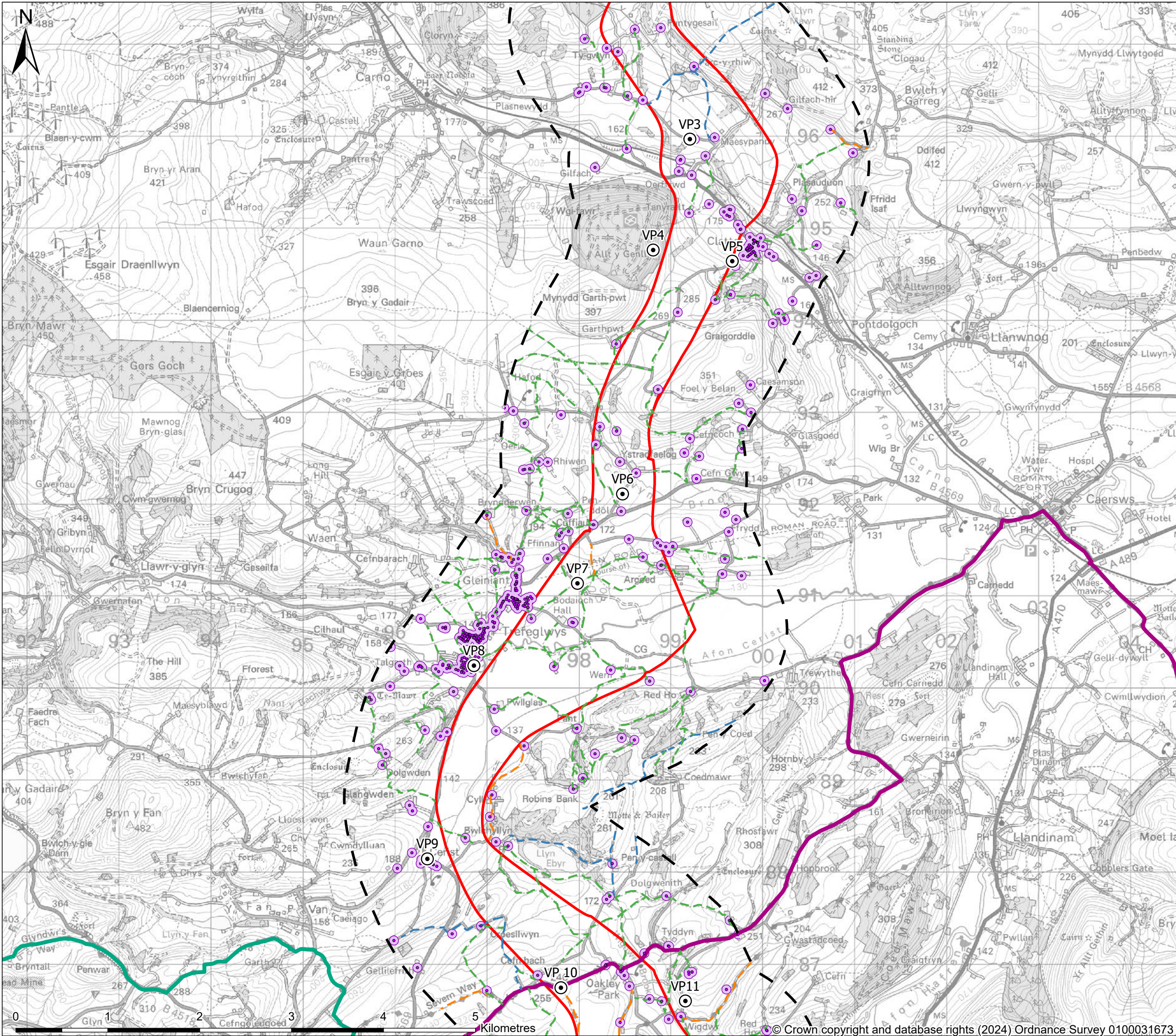
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A3	1:40,000	65208073	P01

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Legend

Scoping Corridor

Scoping Corridor - 1km Buffer

Llyn Lort Energy Park

Banc Du Energy Park

Rhiwas Energy Park

Residential Receptor

Residential Receptor 50m Buffer

National Cycle Network (NCN)

National Trail

Public Rights of Way

BOAT

Bridleway

Footpath

Public Road

Restricted Byway

Representative Viewpoints

VP3 : Maesypandy

VP4 : Allt y Genlli forest trail

VP5 : Clos Hen Dy South west of Clatter

VP6 : Colwyn Bridge, north of B4569

VP7 : Country and Leisure Park Caravan Site

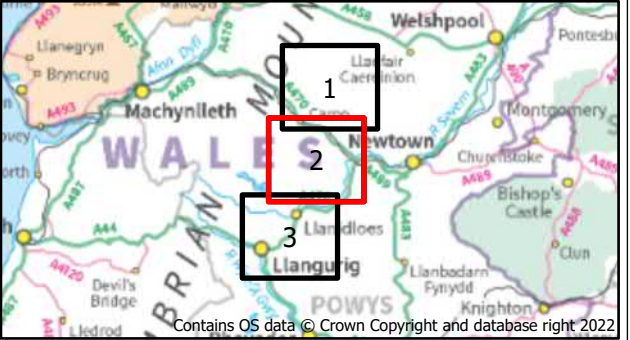
VP8 : South of Trefeglwys

VP9 : B4569 Cerist

VP 10 : National cycle network -Route 81

VP11 : North of Wigdwr Farm

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BANC DU RHIWLAS GRID CONNECTION

Drawing Title

FIGURE 8.5 - VISUAL RECEPTORS
SHEET 2 OF 3

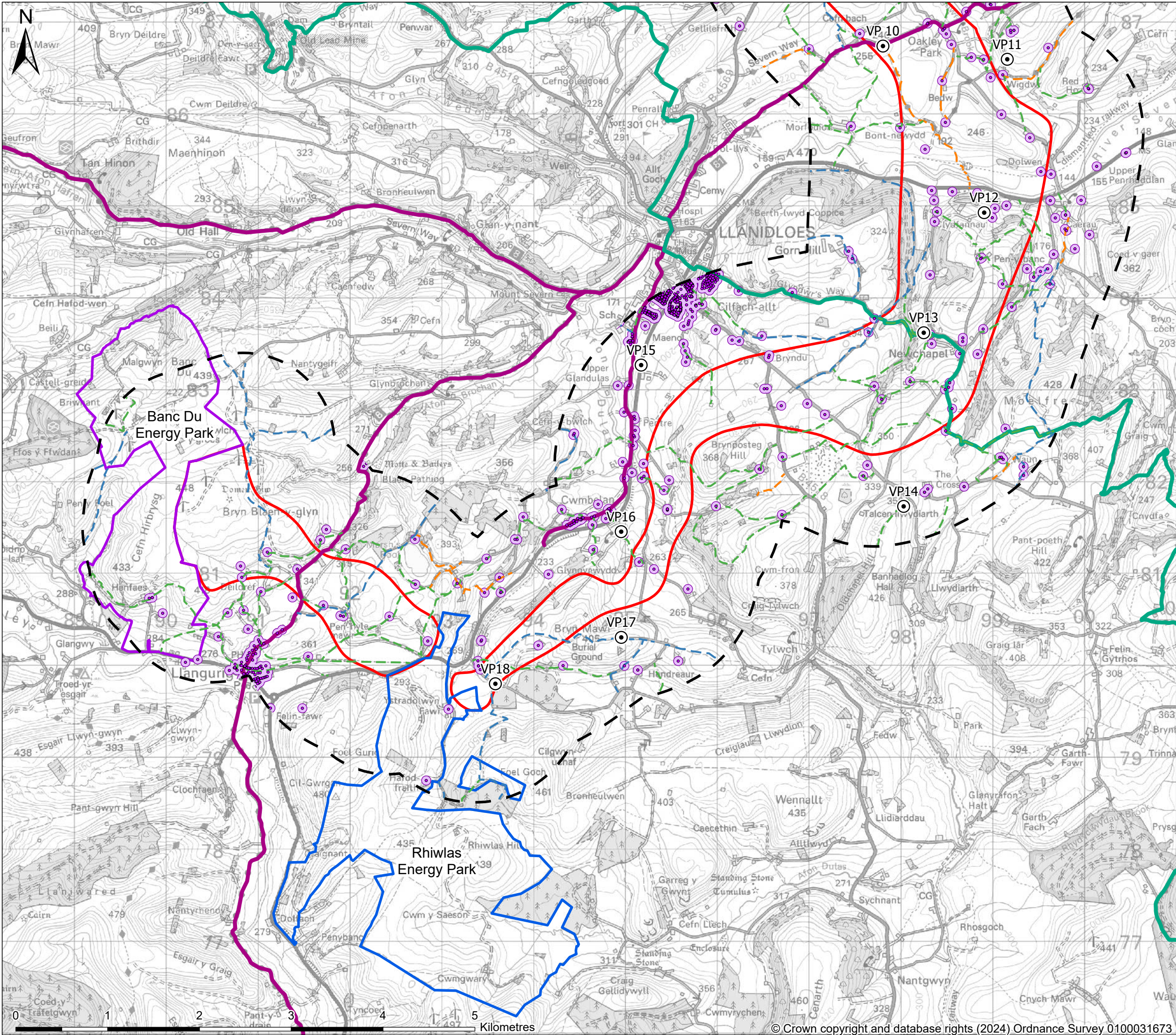
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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Llyn Lort Energy Park
- Banc Du Energy Park
- Rhiwlas Energy Park
- Residential Receptor
- Residential Receptor 50m Buffer
- National Cycle Network (NCN)
- National Trail

Public Rights of Way

- BOAT
- Bridleway
- Footpath
- Public Road
- Restricted Byway

Representative Viewpoints

- VP 10 : National cycle network -Route 81
- VP11 : North of Wigdwr Farm
- VP12 : South of Leylands Caravan Park
- VP13 : Glydwr's Way
- VP14 : PRoW 220/135/1
- VP15 : A470, south of Llanidloes
- VP16 : Cefn-yr-Hafodau PRoW 231/22/2
- VP17 : Bryn Mawr PROW 231/118/3
- VP18 : Cae Celyn, north of Rhiwlas Energy Park PROW 231/40/1

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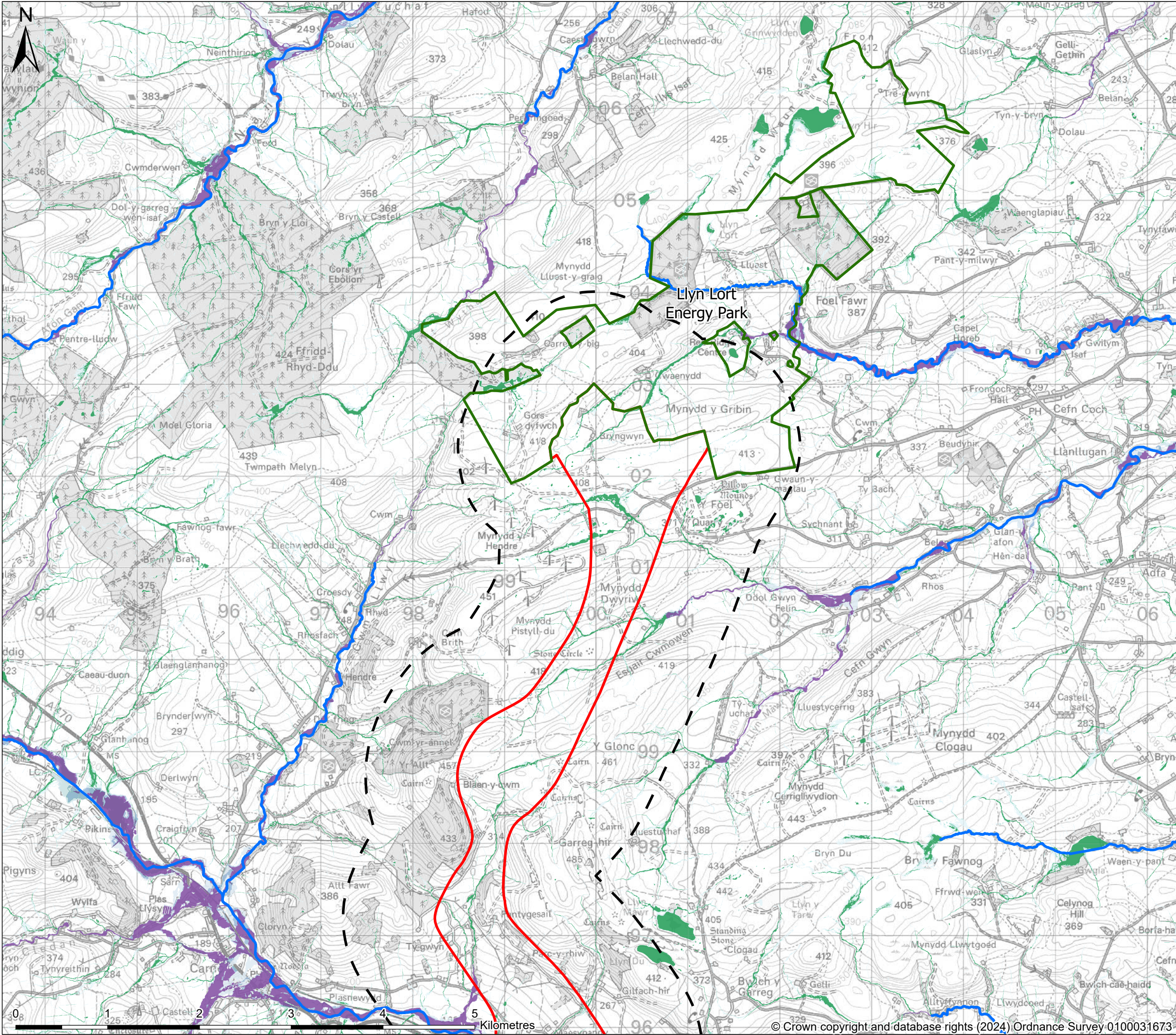
Drawing Title
**FIGURE 8.5 - VISUAL RECEPTORS
SHEET 3 OF 3**

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Legend

- Scoping Corridor
- Scoping Corridor - 1km Buffer
- Banc Du Energy Park
- Rhiwlas Energy Park
- Llyn Lort Energy Park
- WFD waterbody

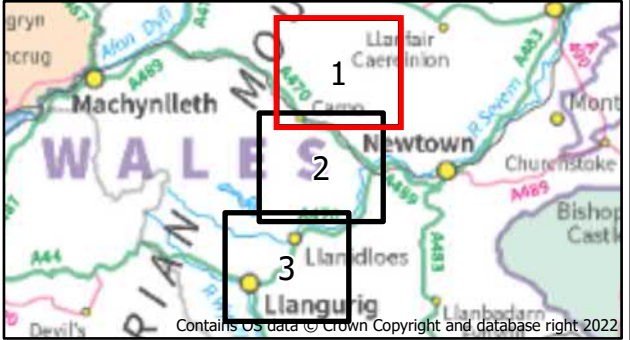
Risk of Flooding From Rivers:

- High
- Medium
- Low

Risk of Flooding From Surface Water and Small Watercourses:

- High
- Medium
- Low

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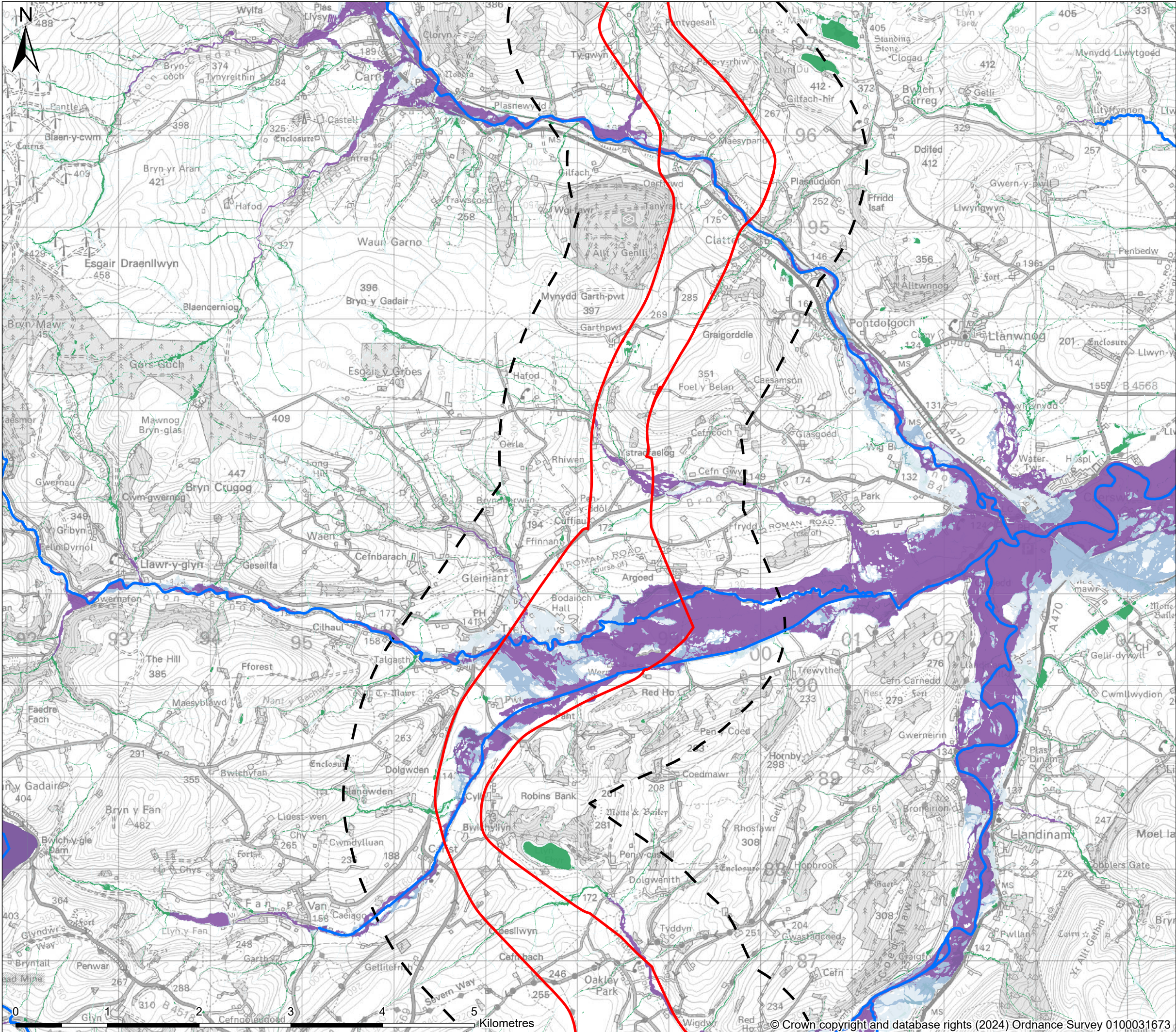
BANC DU RHIWLAS GRID CONNECTION

Drawing Title

FIGURE 13.1 - SURFACE WATER
SHEET : 1 OF 3

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Legend

Scoping Corridor

Scoping Corridor - 1km Buffer

Banc Du Energy Park

Rhiwlas Energy Park

Llyn Lort Energy Park

WFD waterbody

Risk of Flooding From Rivers:

High

Medium

Low

Risk of Flooding From Surface Water and Small Watercourses:

High

Medium

Low

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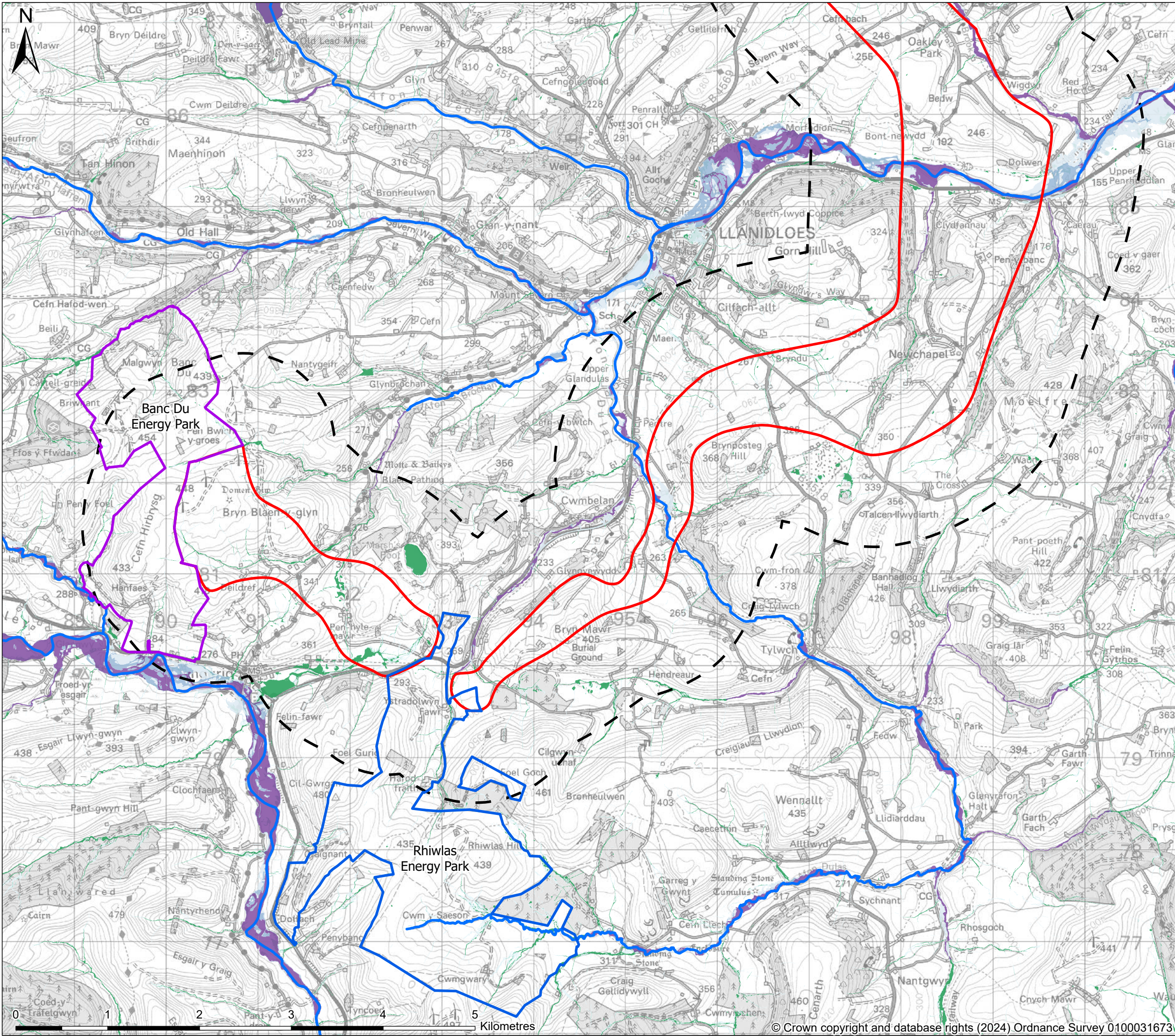
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FIGURE 13.1 - SURFACE WATER
SHEET : 2 OF 3

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Legend

Scoping Corridor

Scoping Corridor - 1km Buffer

Banc Du Energy Park

Rhiwlas Energy Park

Llyn Lort Energy Park

WFD waterbody

Risk of Flooding From Rivers:

High

Medium

Low

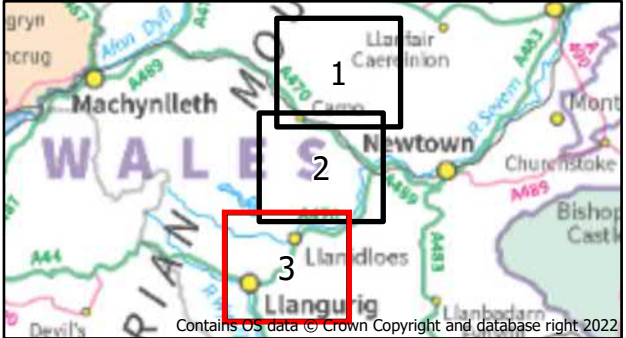
Risk of Flooding From Surface Water and Small Watercourses:

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Medium

Low

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Drawing Title					
FIGURE 13.1 - SURFACE WATER SHEET : 3 OF 3					
Sheet Size A3		Scale 1:40,000		Sweco Ref 65208073	
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