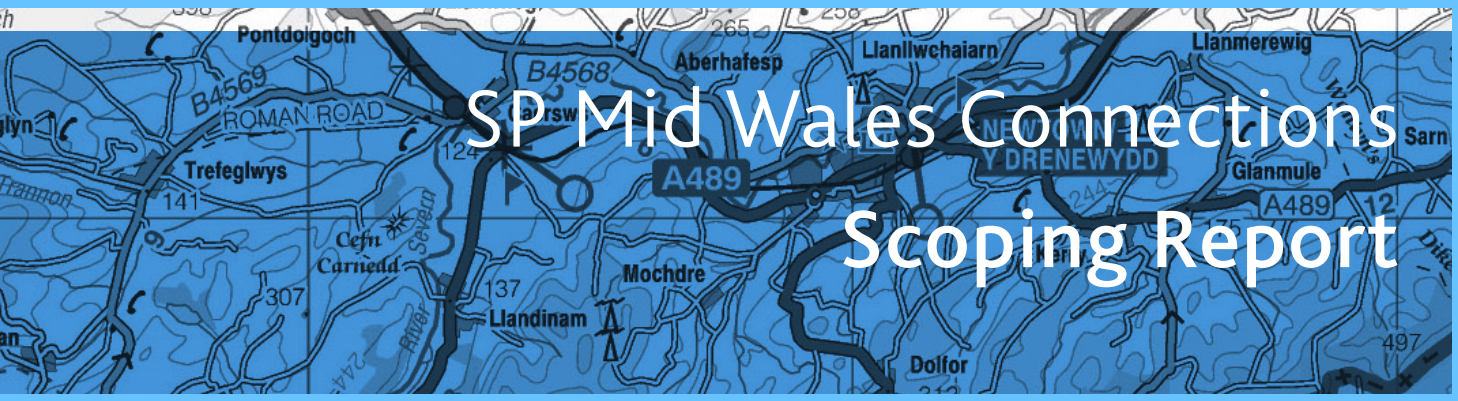
SP MANWEB



SP Mid Wales Connections
Scoping Report

June 2014

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1.0 INTRODUCTION

Background

1.1. SP Manweb plc (SP Manweb) holds the Electricity Distribution License (issued under the Electricity Act 1989 (the 1989 Act) (Ref. 1-1)[1] for the electricity network in Cheshire, Merseyside, North and Mid Wales. Section 9 of the 1989 Act requires SP Manweb to develop and maintain an efficient, co-ordinated and economical system of electricity distribution. The electricity network in this region is managed and maintained on SP Manweb's behalf by ScottishPower Energy Networks (SPEN).

1.2. Under Section 16 of the 1989 Act, SP Manweb has a statutory obligation to provide new electricity connections when required to do so by the owner or occupier of a premises or an authorised electricity supplier. SP Manweb has received network connection requests and agreed connection contracts with the developers of eight proposed onshore wind farm developments located within the administrative boundary of Powys County Council (PCC). The energy generated by the proposed wind farms requires a new 132kV network to be constructed to route the electricity through to the national electricity transmission network.

1.3. SP Manweb has developed a proposal to provide new 132kV connections between the wind farm developments (from their related substations) and a proposed new 400kV/132kV National Grid (NG) substation near Cefn Coch (National Grid Reference (NGR) 299881, 302410) (see Figure 1, Appendix A).

1.4. These 132kV lines and their integral components are a nationally significant infrastructure project (NSIP) under the Planning Act 2008 and form the largest part of the 'SP Mid Wales Connections Project'[2] (SP MWC Project). Under the Planning Act 2008, SP Manweb must submit an application for development consent for the NSIP elements of the SP MWC Project. The SP MWC Project also includes some Associated Development which is not an NSIP and for which SP Manweb will submit separate applications for planning consent. SP Manweb may, however, seek land rights for the Associated Development as part of the development consent order (DCO)for the NSIP under the Planning Act 2008, in order to allow it to construct and operate the Associated Development.

1.5. Following consultation, an application for a DCO (which may include the compulsory acquisition of land rights) will be submitted to the Secretary of State through the Planning Inspectorate (PINS). Following acceptance of the application, PINS will undertake an examination of the submitted documents and may hold public hearings to consider the material and issues brought forward by interested parties. PINS will then report its recommendations on an application to the Secretary of State. The Secretary of State subsequently determines whether to make a DCO for the NSIP.

1.6. As part of its application for a DCO, SP Manweb will submit a series of documents and one of these is an Environmental Statement (ES) which sets out the Environment Impact Assessment (EIA) of the proposals. This Environmental Impact Assessment Scoping Report seeks an opinion from the Secretary of State as to the scope of the EIA to be undertaken for the SP MWC Project and the content of the ES. This is explained further below.

The Need for the Scheme

1.7. The Welsh Government published its policy statement 'A Low Carbon Revolution – the Welsh Assembly Government Energy Policy Statement March 2010', which sets a target of 2 Gigawatt (GW) installed onshore wind capacity for 2015/ 2017 (Ref. 1-2). The policy states that this will be achieved by optimising the use of strategic areas set out in Technical Advice Note (TAN) 8 on Planning for Renewable Energy. TAN 8 identifies seven broad areas where, for efficiency and environmental reasons amongst others, large scale (over 25 megawatt (MW) onshore wind developments should be concentrated (Ref. 1-3). These areas are termed Strategic Search Areas (SSAs). Four of these SSAs are located within the SP Manweb network operating area.

1.8. Since the publication of TAN 8, a number of developers have put forward applications for wind farm developments within the specified SSAs. In tandem with a wind farm application, the developer frequently submits a connection request to SP Manweb under Section 16 of the 1989 Act (Ref. 1-1).

1 References used in this document are listed at the end of this EIA Scoping Report.
2 A glossary of terms and abbreviations used in this report is provided at the end of this EIA Scoping Report.

1.9. The eight proposed onshore wind farm developments (hereafter referred to as the 'Contracted Wind Farms') are located in two of the TAN 8 SSAs in Mid Wales: SSA B and SSA C. Planning consents for the Contracted Wind Farms are outstanding.

1.10. The proposed generation and planning status of the Contracted Wind Farms are provided in Table 1.1 below.

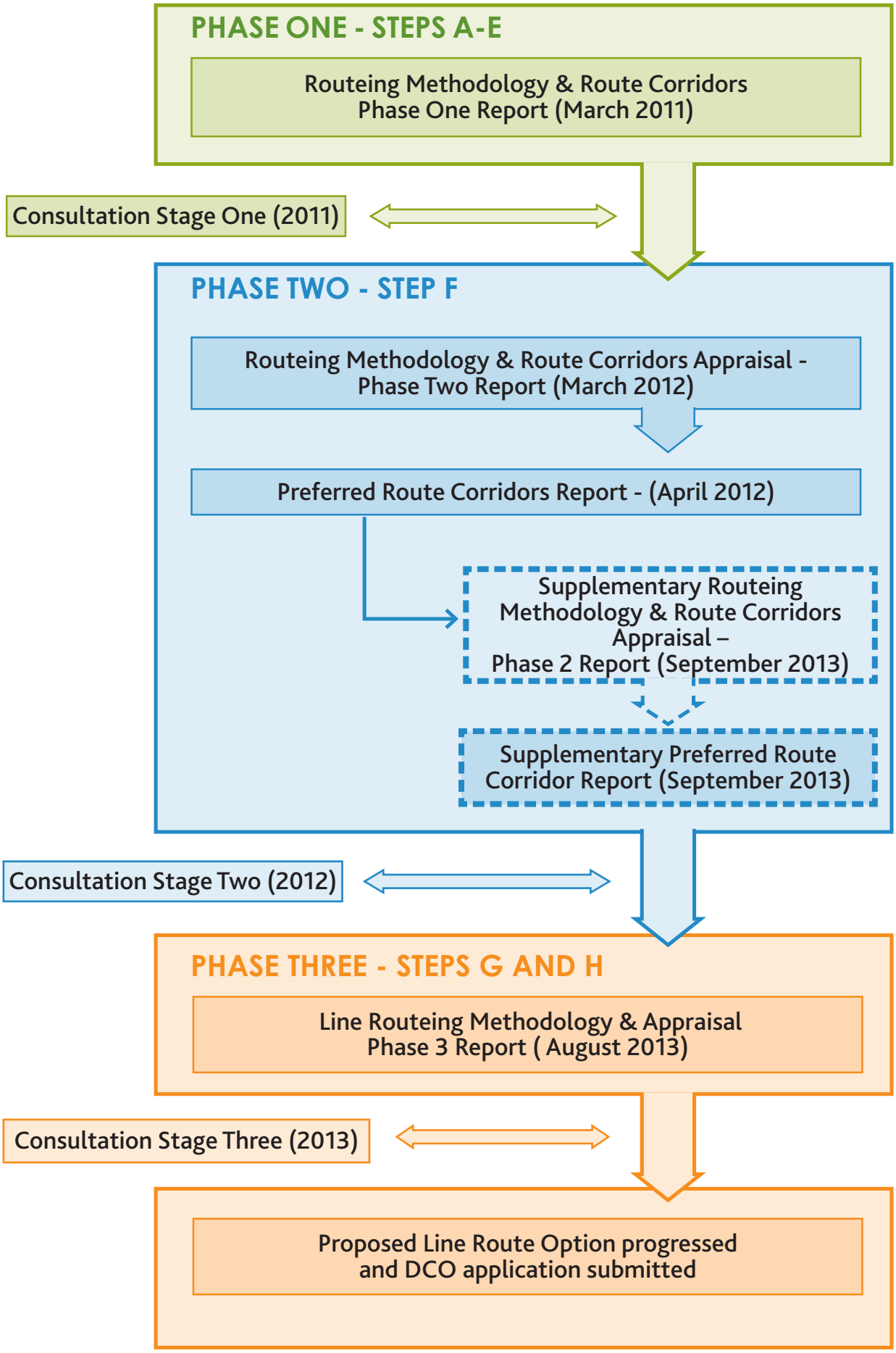
Table 1.1 | The Contracted Generation

Wind Farm	MW Output	Substation Location NGR		Planning Status
		X	Y	
SSA B				
Dyfnant Forest	78	301541	313303	Application for a development consent order (DCO) Submitted (Nationally Significant Infrastructure Project (NSIP))
Mynydd Lluest y Graig	99	298351	305218	NSIP – application for a DCO to be submitted 2016
Llanbrynmair	90	294697	305342	Mid Wales (Powys) Conjoined Wind Farms Public Inquiry 2013-14
Carnedd Wen	150	294600	305100	Mid Wales (Powys) Conjoined Wind Farms Public Inquiry 2013-14
Carno III	48	293350	296000	Submitted (Powys CC)
SSA C				
Llaithddu	74.4	304440	279675	Mid Wales (Powys) Conjoined Wind Farms Public Inquiry 2013-14
Llanbadarn (Fynydd)	61.2	309971	281740	Mid Wales (Powys) Conjoined Public Inquiry 2013-14
Neuadd Goch Bank	30	308909	284294	Submitted (Powys CC)

Strategic Optioneering and Line Route Design Evolution

1.11. SP Manweb has undertaken in depth optioneering, route design, and consultation to identify the best technical and environmental solution for connecting the Contracted Wind Farms to the proposed NG substation near Cefn Coch.

1.12. Line routeing has followed a process of reviewing technical and environmental considerations and community consultation since March 2011, as described in the following flowchart. SP Manweb's consultation process is described in detail in the relevant published documents and summarised in Chapter 3 of this EIA Scoping Report.


PHASE ONE - STEPS A-E
Routeing Methodology & Route Corridors
Phase One Report (March 2011)
Consultation Stage One (2011)
PHASE TWO - STEP F
Routeing Methodology & Route Corridors Appraisal -
Phase Two Report (March 2012)
Preferred Route Corridors Report - (April 2012)
Supplementary Routeing
Methodology & Route Corridors
Appraisal –
Phase 2 Report (September 2013)
Supplementary Preferred Route
Corridor Report (September 2013)
Consultation Stage Two (2012)
PHASE THREE - STEPS G AND H
Line Routeing Methodology & Appraisal
Phase 3 Report (August 2013)
Consultation Stage Three (2013)
Proposed Line Route Option progressed
and DCO application submitted

1.13. SP Manweb has produced a suite of reports and consultation documents that provide a detailed account of the line route optioneering, technical assessments, consultation and design work undertaken since March 2011 (see Table 1.2). These reports are available for download at http://www.spmidwalesconnections.info/english/downloads/ and can be read in conjunction with this EIA Scoping Report to provide further design evolution context.

Table 1.2 | Published Documents Relating to the Routeing and Consultation Process

Consultation Stage One (March 2011)	Initial Strategic Optioneering Report (March 2011)	Routeing Methodology & Route Corridors Phase One Report (March 2011)
Start of Consultation Stage Two (April 2012)	Preferred Route Corridors Report (April 2012)	Second Strategic Optioneering Report (March 2012)
	Stage One Consultation Feedback Report (March 2012)	Routeing Methodology & Route Corridors Appraisal Phase 2 Report (March 2012)
	Routeing Methodology & Route Corridors Appraisal Phase 2 Report (March 2012)	Routeing Methodology & Route Corridors Appraisal Phase 2 Report (March 2012)
	Strategic Ecological Report (March 2012)	Strategic Ecological Report (March 2012)
	Field-Based Landscape Sensitivity in Relation to Overhead lines (March 2012)	Cultural Heritage Report (March 2012)
End of Consultation Stage Two (September 2013)	Supplementary Preferred Route Corridor Report (September 2013)	Stage Two Consultation Feedback Report (September 2013)
	Third Strategic Optioneering Report (September 2013)	Supplementary Routeing Methodology & Route Corridors Appraisal - Stage Two Report (September 2013)
	Strategic Ecological Report 2 (September 2013)	
Start of Consultation Stage Three (October 2013)	Line Routeing Methodology & Appraisal - Phase 3 Report (September 2013)	Revised Consultation Strategy (September 2013)
	Revised Statement of Community Consultation (SoCC) (September 2013)	
End of Consultation Stage Three (May 2014)	Stage Three Feedback Report (May 2014)	
Start of Consultation Stage Four (June 2014)	Preferred Line Route Report (May 2014)	EIA Scoping Report (June 2014)

1.14. The strategic optioneering process concluded that a combined transmission and distribution design with the proposed 400kV/132kV NG substation at Cefn Coch (hereafter referred to as the 'proposed NG substation') is the preferred solution for the connection of the Contracted Wind Farms.

1.15. The line route selection process started by identifying potential broad route corridors, of varying widths between 0.5 and 4 km, from the Contracted Wind Farms to the proposed NG substation. Subsequent route corridor studies assessed these broad route corridors and these were consulted on in Consultation Stage Two. Preferred Route Corridors (BNC, BSC and CC1) were then identified in the 'Supplementary Preferred Route Corridor Report' (September 2013). The announcement of these corridors concluded the Stage Two Consultation and the Preferred Route Corridors were taken forward to the line routeing stage.

1.16. Having refined the Preferred Route Corridors down to 100 m wide corridors, the Stage Three Consultation commenced with SP Manweb announcing those line routes that would have the least environmental effect (as demonstrated in the 'Line Routeing Methodology & Appraisal - Phase 3 Report' (September 2013)). These were presented to local communities and landowners in the Stage Three Consultation as the 'Suggested Line Routes'.

1.17. Following consideration of the Stage Three Consultation feedback, engineering constraints, and environmental considerations, SP Manweb has now selected its Preferred Line Route Alignments, which are 100 m wide based on an indicative centre line. These have been announced via Stage Four of the consultation process. The Preferred Line Route Alignments are now the subject of detailed line design and will be taken forward to consultation at Stage Five in autumn 2014.

Preferred Line Alignments and Preferred Line Route Alignments

1.18. For the purposes of the EIA scoping study, and to inform the EIA Study Areas and the EIA consultation process, 'Preferred Line Alignments' have been set out within approximately 100 m wide 'Preferred Line Route Alignments'. These Preferred Line Alignments and Preferred Line Route Alignments are shown on Figures 1 and 2 (Appendix A).

1.19. The detailed design of the line alignments (including indicative construction land take requirements) is sufficiently evolved to enable Preferred Line Alignments (based on an indicative centre line alignment) to be demarcated within Preferred Line Route Alignments).

1.20. The Preferred Line Route Alignments are individually labelled the 'BNC Preferred Line Route Alignments', the 'BSC Preferred Line Route Alignment' and the 'CC Preferred Line Route Alignments'.

1.21. The Preferred Line Alignments are indicative at this stage and will be adjusted in response to the detailed line design process, the EIA and on-going consultation process.

Proposed Line Alignments and Proposed Line Route Alignments

1.22. Following the completion of the detailed design process and Stage Five consultation, the finalised Line Alignments and Line Routes to be taken forward for consent will be referred to as the 'Proposed Line Alignments and 'Proposed Line Route Alignments' respectively.

1.23. It is important to note that consent will be sought to construct the 132kV lines anywhere within the Proposed Line Route Alignments, which are expected to be around 100 m wide (with local variations in width to take account of constraints to be avoided and land take required). This approach, which is common within the industry for the consenting of this type of linear project, will allow for ongoing landowner discussions as to the precise location of the overhead lines and to allow for micro-siting of the overhead line supports.

1.24. Given the SP MWC Project is predominantly concerned with the installation of new 132kV connections, the focus of the project is on the line route corridors (i.e. the Preferred/ Proposed Line Route Alignments) required for these connections within which the 132kV lines themselves would sit (i.e. the Preferred/ Proposed Line Alignments). It should be noted though that the Proposed Line Route Alignments will include other works integral to the connections, such as works to the existing electricity network in some sections, construction access and working areas, and the provision of mitigation. These works are described below.

Line Route Design Evolution Summary

1.25. A summary of the designs consulted on during each consultation stage is provided in Table 1.3 below.

Table 1.3 | Design Stages

Consultation Stage	Design Consulted On
Stage One	Possible Broad Route Corridors for connections (0.5 to 4 km wide)
Stage Two	Preferred Route Corridors (0.5 to 4 km wide)
Stage Three	Suggested Line Routes (approximately 100 m wide)
Stage Four	Preferred Line Route Alignments (approximately 100 m wide based on centre line Preferred Line Alignments)
Stage Five	Proposed Line Route Alignments (approximately 100 m showing an Indicative Line Alignment within each of the Proposed Line Route Alignments).

Components of the SP MWC Project

1.26. The SP MWC Project as a whole comprises both the NSIP itself (referred to below as the Proposed Development) as well as Associated Development that does not form part of the NSIP. These elements are described in further detail below and in Chapter 2 of this EIA Scoping Report.

1.27. Also described below is Related Development; which is development that is closely linked in commercial and design terms to the SP MWC Project.

Proposed Development

1.28. The development and operation of an overhead electric line (and its integral components), over 2 km in length with a voltage capacity at or above 132kV, is defined as a NSIP under Sections 14 (1)(b) and 16 (1)(b) of the Planning Act 2008 (as amended) (Ref. 1-4)

1.29. The Proposed Development currently comprises the following:

- *Approximately 67 km 132kV single circuit overhead wood pole lines;*
- *Approximately 4 km 132kV double circuit overhead steel tower line;*
- *Options for potential 132kV underground cable;*
- *Diversion of approximately 150 m of the existing 132kV overhead line that runs from Carno I and Carno II wind farms into the existing 132kV Newtown – Oswestry circuit;*
- *Integral undergrounding of a section of the existing 33kV overhead line south of Trefeglwys;*
- *Integral construction works and accesses for the above works; and*
- *Integral mitigation works for the Proposed Development (e.g. screen planting, habitat enhancements).*

1.30. The undergrounding and diversion components are included because these works are integral to the project. As such, SP Manweb considers it more appropriate to include them in the NSIP, though it notes that in any event, it has the benefit of permitted development rights for such works.

1.31. The locations of the components of the Proposed Development and the Indicative DCO Site Boundary are shown on Figure 2 (Appendix A).

Associated Development

1.32. Separate consent applications will be submitted by SP Manweb in respect of a 33kV overhead line connection between the proposed Neuadd Goch Bank Wind Farm (one of the eight Contracted Wind Farms) and the NSIP Development (the CC Preferred Line Route Alignment).

1.33. The Neuadd Goch Bank Wind Farm connection comprises:

- *Approximately 2 km 33kV single circuit overhead wood pole lines (hereafter referred to as the '33kV Neuadd Goch Bank overhead line');*
- *A 132kV/ 33kV substation (hereafter referred to as the '132kV/ 33kV Neuadd Goch Bank substation'); and*
- *Associated construction works and accesses.*

1.34. An application for construction of the 33kV overhead line will be submitted under the provisions of Section 37 of the Electricity Act 1989. A planning application under the Town and Country Planning Act 1990 (Ref. 1-5) will be submitted to PCC for the 132kV/33kV substation.

Related Development

1.35. The SP MWC Project forms part of a coordinated series of projects to generate energy in Mid Wales and to provide connection to the National Electricity Transmission System (NETS). The source of energy generation and the means by which this energy will connect to the NETS are considered to be 'Related Developments' and are subject to separate planning consents and EIA.

1.36. The Related Developments include:

- *The eight proposed Contracted Wind Farms described in Table 1.1 (above);*
- *The proposed NG 400kV/132kV substation; and*
- *The proposed NG 400kV connection.*

1.37. The indicative locations of Related Developments are shown on Figure 3 (Appendix A).

Contracted Wind Farms

1.38. The Contracted Wind Farms are subject to separate individual planning consents, which, at the time of publication of this ES Scoping Report, are outstanding.

Proposed NG 400kV/132kV Substation and 400kV Connection

1.39. NG owns and operates the high-voltage transmission network in Wales and England and has a duty to transmit electricity to local distribution networks for onward supply to homes and businesses.

1.40. In response to the new energy generating infrastructure currently being developed in Mid Wales, NG has been requested to provide a new 400kV/132kV substation in Powys (hereafter referred to as the 'proposed NG substation'). A new outgoing NG 400kV connection to the east of the proposed NG substation would route through the Vyrnwy Valley to connect the substation to the existing electricity NETS in Shropshire (hereafter referred to as the 'proposed NG 400kV connection').

1.41. The proposed NG substation and 400kV connection to the Proposed Development will be taken forward by NG and it is not included in the SP MWC Project DCO application. However, SP Manweb would own and manage the 132kV side of the 400kV/132kV substation.

Environmental Impact Assessment Regulations

1.42. The Proposed Development is considered to fall within Schedule 2, Part 3(b): "industrial installations for carrying gas, steam and hot water; transmission of electrical energy by overhead cable" of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended) (Ref. 1-6). Schedule 2 developments require EIA if specific development thresholds are exceeded or if the development is likely to have significant effects on the environment.

1.43. The Associated Development will not be taken forward as part of the DCO Application and separate consenting regimes (and EIA Regulations) apply. From a review of the relevant EIA regulations (Ref 1-7 and Ref. 1-8), the Associated Development on its own is not considered to require formal EIA.

1.44. As there are clear associations between the Proposed Development and the other components of the SP MWC Project, the Associated Development and Related Development will be assessed cumulatively in a Cumulative Effects Chapter of the ES.

1.45. This approach to the EIA and the cumulative assessment is described more fully in Chapters 4 and 5 of this EIA Scoping Report.

EIA Scoping Process

1.46. This EIA Scoping Report represents notification to the SoS under Regulation 6(1)(b) of the EIA Regulations, that SP Manweb will undertake an EIA in respect of the Proposed Development and will produce an Environmental Statement (ES) to report the findings of the EIA.

1.47. The ES will form part of the application that will be submitted to the Planning Inspectorate (PINS) seeking Development Consent for the Proposed Development under the Planning Act 2008 (Ref. 1-4).

1.48. EIA Scoping is a voluntary process undertaken by a developer and the SoS. It seeks the opinion of the SoS as to the information that should be provided in an ES. The SoS then issues an opinion on the information to be provided in an ES.

1.49. Scoping allows stakeholders an early opportunity to comment on the proposed structure, methodology and content of an ES. It provides a framework for identifying the likely significant environmental effects of a project and assists the EIA process in distinguishing priority issues to be addressed. By doing so, the scoping phase assists in focusing attention on key environmental topics for inclusion within the EIA process and subsequent ES.

1.50. The objectives of the EIA scoping process are to:

- *Consider the nature of the scheme, including (where known) its purpose, physical characteristics, land use requirements and alternatives;*
- *Identify and describe the key environmental topics that the EIA must consider;*
- *Identify the environmental topics that are not relevant to the EIA;*
- *Define the extent to which environmental topics need to be investigated including cumulative effects, and the methodology for assessment; and*
- *Enable consultation with statutory consultees.*

1.51. This EIA Scoping Report sets out the work that is proposed to be taken forward into the EIA to identify the likely significant environmental effects of the Proposed Development. There is no statutory definition of what constitutes a likely significant environmental effect. For the purposes of this EIA, a significant effect has been defined as an effect which, either in isolation or together with others, should (in the professional opinion of the environmental specialists) be taken into account in the decision making process.

EIA Scoping Request

1.52. This EIA Scoping Report constitutes a formal request for a Scoping Opinion from the SoS pursuant to Regulation 8(1) of the EIA Regulations. The SoS is invited to consider the contents of this EIA Scoping Report and comment accordingly within the 42 day period prescribed by the EIA Regulations.

1.53. This EIA Scoping Report satisfies the requirements of Regulation 8(3) of the EIA Regulations by providing a plan of the area (see Figures 1 and 2, Appendix A), a description of the nature and purpose of the proposed works, and a description of the possible effects on the environment.

1.54. Table 1.4 presents a list of information which should be included in a Scoping Report, as highlighted in the PINS Advice Note Seven (Ref. 1-9), and the location where in this report the information is presented.

Table 1.4 | Information Provided in this EIA Scoping Report (based on PINS Advice Note Seven)	
Description of Information Required	**Where the Information is Presented in the EIA Scoping Report**
A plan showing: ▫ *the proposed draft site boundary, including any associated development;* ▫ *any permanent land take required;* ▫ *any temporary land take required for construction;* ▫ *any existing infrastructure which would be retained or upgraded for use;* ▫ *any existing infrastructure which would be removed; and* ▫ *features including planning constraints and designated areas on and around the Site, such as national parks or historic landscapes.*	Appendix A
A description of: ▫ *the site;* ▫ *the development; and* ▫ *its possible effects on the environment.*	Chapters 2 and 7 - 16
An outline of the main alternatives considered and the reasons for selecting a preferred option.	Chapter 1
Results of desktop and baseline studies where available.	Chapters 7 - 16
Referenced plans presented at an appropriate scale to convey clearly the information and all known aspects associated with the proposal.	Appendix A
Guidance and best practice to be relied upon, and whether this has been agreed with the relevant bodies together with copies of correspondence to support these agreements.	Chapters 4 - 16
Methods used or proposed to be used to predict impacts and the significance criteria framework used.	Chapters 4 - 16
Any mitigation proposed and predicted residual impacts.	Chapters 4 - 16
Where cumulative development has been identified, how the developer intends to assess these impacts in the ES.	Chapters 5 and 7-15
An indication of any European designated nature conservation sites that are likely to be significantly affected by the Proposed Development and the nature of the likely significant impacts on these sites.	Chapters 4 - 16 and Appendix A
Key topics covered as part of the developer's scoping exercise.	Chapters 4 - 16
An outline of the structure of the proposed ES.	Chapter 4
Where SP Manweb seeks to scope out matters, a full justification for scoping out such matters.	Chapters 4 - 16

Statutory Consultation

1.55. To inform his Scoping Opinion, the SoS is statutorily obliged to consult with a number of consultees set out in the EIA Regulations. SP Manweb understands that PINS will notify consultation bodies as required in accordance with Regulation 9(1) of the EIA Regulations. PINS may also invite comments from other relevant bodies and third parties to inform their opinion.

1.56. All comments and information received from EIA Scoping consultees will be used to inform the EIA process, the content of the final ES, and the scope, extent and methods used to carry out the various environmental assessments required.

Content and Structure of this EIA Scoping Report

1.57. The structure of this EIA Scoping Report is as follows:

- *Chapter 2 provides a description of the Proposed Development and provides an interpretation of its location, site settings and surroundings;*
- *Chapter 3 summarises consultations held to date and those planned during the EIA process;*
- *Chapter 4 determines the general scope of the assessment and methodology to be adopted in the EIA, introduces the key topics covered as part of the scoping study, and provides an outline for the proposed structure for the ES;*
- *Chapter 5 defines the scope of the EIA Cumulative Assessment;*
- *Chapter 6 presents a general overview of the national, regional and local planning policy framework in relation to the Proposed Development;*
- *Chapters 7 - 15 present the key topics proposed to be included within the EIA and covered as part of the scoping study. For each topic the following is provided:*
  - *Baseline conditions (results of desk top and baseline studies and review of existing studies where relevant);*
  - *Methodology for assessment and surveys specific for the topic assessment;*
  - *Potential effects of the development; and*
  - *Potential and scope for mitigation measures.*
- *Chapter 16 provides a justification for scoping out specific topics from the EIA;*
- *Chapter 17 summarises the conclusions of the EIA Scoping Report.*

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Introduction

2.1. As noted in Chapter 1 of this EIA Scoping Report, the EIA will assess the potential impacts of the Proposed Development, which is summarised as follows:

- *Approximately 67 km 132kV single circuit overhead wood pole lines and 4 km 132kV double circuit overhead steel tower design;*
- *Options for potential 132kV underground cable;*
- *Diversion of approximately 150 m of the existing 132kV overhead line that runs from Carno I and Carno II wind farms into the existing 132kV Newtown – Oswestry circuit;*
- *Integral undergrounding of a section of the existing 33kV overhead line south of Trefeglwys;*
- *Integral construction works and accesses for the above works; and*
- *Integral Mitigation works for the Proposed Development (e.g. screen planting, habitat enhancements).*

2.2. A map showing the location of the Proposed Development is provided in Figures 1 and 2 (Appendix A).

2.3. This chapter provides an overview of the setting of the Proposed Development, a description of the Indicative DCO Site Boundary and Preferred Line Route Alignments, and details of the individual engineering and construction elements of the Proposed Development.

Indicative DCO Site Boundary

2.4. The proposed new 132kV overhead lines and underground cables and the majority of the integral construction, access and mitigation works will be within 100 m wide Preferred Line Route Alignments. There is also a need for some new integral construction accesses to be formed outside of these Line Routes.

2.5. An Indicative DCO Site Boundary is shown on Figure 2 (Appendix A). This boundary delineates the area in which the Proposed Development will be constructed and encompasses the Preferred Line Route Alignments and the integral, indicative construction and mitigation areas and accesses that lie outside the Preferred Line Route Alignments.

2.6. The Indicative DCO Site Boundary will be refined as the detailed design of the Proposed Development evolves and a finalised DCO Site Boundary will be submitted with the DCO Application.

The Preferred Line Route Alignments

2.7. The Preferred Line Route Alignments are based on an indicative centre line alignment referred to as the Preferred Line Alignments. These are indicative at this stage and will be adjusted in response to the detailed line design process, the EIA and on-going consultation process. Similarly, the Preferred Line Route Alignments may alter following further consultation, design and EIA work.

2.8. The Preferred Line Route Alignments are individually labelled the 'BNC Preferred Line Route Alignments', the 'BSC Preferred Line Route Alignment' and the 'CC Preferred Line Route Alignments' and each has been given a specific colour:

- *The BNC Preferred Line Route Alignments (indicated as a red route) link the Contracted Wind Farms in SSA B North (Dyfnant Forest, Mynydd Lluest y Graig, Llanbrynmair, and Carnedd Wen) to the proposed NG substation;*
- *The BSC Preferred Line Route Alignments (indicated as a blue route) links the proposed Carno III Wind Farm in SSA B South with the proposed NG substation; and*
- *The CC Preferred Line Route Alignments (indicated as a green route) link the Contracted Wind Farms in SSA C (Llaithddu and Llanbadarn (Fynydd)) to the proposed NG substation.*

2.9. The BNC and CC Preferred Line Route Alignments are sub-divided into Preferred Line Route Alignments: BNC1, BNC2, BNC3, BNC4, BNC5, and BSC, and CC1, CC2 and CC4.

2.10. The Preferred Line Route Alignments are situated within the PCC authority area in Mid Wales. They pass through the rural valleys of Powys County where there exists a variety of land types and uses, including: farmland; residential properties and villages; woodland and plantations; wind farms and moorland.

2.11. The Preferred Line Route Alignments generally traverse an area of Mid Wales stretching southward from the proposed Dyfnant Forest Wind Farm and extending past the settlements of Carno, Trefeglwys, Llanidloes and Llwydiarth. From here the CC Preferred Line Route Alignment traverses in an easterly direction, passing to the north of Banc Du to the proposed Llanbadarn (Fynydd) wind farm near the Camnant valley.

2.12. In terms of geology, the mountain ranges of Mid Wales are predominantly formed from Ordovician and Silurian sandstones and mudstones. The Preferred Line Route Alignments overlie Wenlock deposits in the northern and eastern extents and Llandovery in the central part.

2.13. Topographically, the Preferred Line Route Alignments lie to the north east of the Cambrian Mountains and traverse through a landscape of hills and valleys keeping to the lower reaches of the valleys where possible. The BNC Preferred Line Route Alignments pass through land which generally ranges in height from c. 170 metres above ordnance datum (mAOD) in the north to c. 380 mAOD in the west. The land in the BSC Preferred Line Route Alignment varies in height between 200 mAOD to 400 mAOD at the proposed Carno III wind farm. The CC Preferred Line Route Alignments pass through land ranging in height from c. 450 mAOD in the northern part to c. 130 mAOD near Trefeglwys where it passes Afon Trannon. Preferred Line Route Alignment Sections CC2 and CC4 are located in a landscape which rises highest; c. 570 mAOD near the Garn Fach plantation.

2.14. There are a number of watercourses through which the Preferred Line Route Alignments cross, the largest of which include the Afon Banwy, Afon Carno, Afon Trannon, Afon Hafren/ River Severn, and the River Ithon.

2.15. There are many environmentally designated sites and features located within a 10 km radius of the Preferred Line Route Alignments, the locations of which are illustrated in the constraints plans provided in this EIA Scoping Report. A large constraints overview is provided (Figure 4A, Appendix A).

2.16. Further consideration of environmental designations in relation to the proposed scope of the EIA is provided within Chapters 6-14 of this EIA Scoping Report. A set of constraints plans relating to the topics discussed in Chapters 6-14 of this EIA Scoping Report is also provided (Figures 4B (i-v) and 4C (i-v), Appendix A).

BNC Preferred Line Route Alignments

2.17. The BNC Preferred Line Route Alignments are approximately 22 km in length and comprise the following Preferred Line Alignments:

2.18. **BNC1** - an approximately 11 km 132kV single circuit overhead line on wood pole supports from the proposed Dyfnant Forest Wind Farm connecting into the BNC2 Preferred Line Route Alignment.

2.19. The route runs south from Dyfnant Forest, passing west of a property at Penyffordd. The route continues south, following a shallow valley through the farmland. It turns slightly south by south-west to skirt the high ground north of Blowty-bach, before turning again to south by south-east to descend into the Blanwy valley. The route passes between Llangadfan village and properties at Blowty, avoiding mature trees around Blowty and along a field boundary to the west.

2.20. Crossing the A458 where the flood zone is relatively narrow, the route runs southward crossing the Afon Banwg to the east of Stone House. Crossing the minor road east of Ty Gwyn, the route turns south west to skirt the base of a ridge avoiding ancient woodland and taking advantage of backclothing. It turns south by south-west to pass between the ancient woodland and the riparian trees along the Afon Gam; however, a small area of the ancient woodland will need to be cleared. Crossing the minor road, the route follows the east bank of Afon Gam until it reaches Gwaelod, where the river will be crossed.

2.21. The route will then follow the west bank of the Afon Gam, following the river closely to avoid field boundary trees where possible. The route passes to the north west of Haelfron, avoiding residential properties. Near Dol-Hywel, the route turns south, avoiding the widest part of the flood zone, and crosses the Afon Gam where the riparian woodland is narrow. On the south side of the river is a wooded river terrace. The route is aligned to climb this terrace at a point where there is least woodland. Over the rest of this section, the route crosses relatively unconstrained open pasture and upland fringe, avoiding the highest ground, to the point west of Cringoed-isaf. The route then turns south east, climbing across open moorland to pass between the high point of Mynydd Pantyceiliagwydd and the plantation to the south. At this point, BNC1 passes that point where the Mynydd Lluest y Graig Wind Farm connects to the BNC2 Preferred Line Route Alignment.

2.22. **BNC2** – approximately 1 km 132kV single circuit overhead line on wood pole supports from the proposed Mynydd Lluest y Graig Wind Farm into BNC5 Preferred Line Route Alignment.

2.23. The route continues south west, staying on the southern side of the ridge between Mynydd Pantyceiliagwydd and Bryn y Castell and following a stream before entering a coniferous plantation. BNC2 will join BNC5 at Cors yr Ebolion, to the south of Bryn y Castell, within the forestry plantation.

2.24. **BNC3 and BNC 4** - approximately 310 m of 132kV underground cable connects the Carnedd Wen Contracted Wind Farm substation and then two 132kV single circuits each of approximately 3.2 km on wood pole supports from the proposed Llanbrynmair and Carnedd Wen Wind Farms respectively into BNC5 Preferred Line Route Alignment.

2.25. The two connections will run in parallel from the adjacent Contracted Wind Farm substations, to the point where they meet BNC1 and BNC2 to join into BNC5.

2.26. From the Llanbrynmair and Carnedd Wen Wind Farm substations, which are sited adjacent to each other, the two wood pole connections run north-east to descend from the upland into the Nant y Graig Lwyd. The combined route then turns east to run north of riparian woodland and north of the two properties at Cwmderwen. The route crosses the Afon Gam where there are no riparian trees, and then continues south-east. This part of the route is aligned along the edge of coniferous plantations, in order to achieve backclothing, although the route pulls away from the plantation edge to take account of wind turbine clearance requirements. To avoid further wind turbines, the line routes are aligned through coniferous plantation to Cors yr Ebolion, where they will connect into BNC5.

2.27. **BNC5** - from where the above four circuits converge to a single point near at Cors yr Ebolion, an approximately 4 km 132kV double circuit overhead tower line on L7 towers would connect into the proposed NG substation.

2.28. From Cors yr Ebolion, the route runs southward across open moorland where it crosses the Nant Wythan, then turns east by south-east along the south side of a coniferous plantation, again to take advantage of backclothing, and avoiding the higher ground to the south.

2.29. The route continues in a south-easterly direction, crossing the Afon Cwm Llwyd. It passes south of Gors-dyfwch then crosses the ridge west of Bryngwyn where it is a relatively unpronounced landform. The route then turns east to approach the SP Manweb part of the proposed NG substation near Bryngwyn.

BSC Preferred Line Route Alignment

2.30. The BSC Preferred Line Route Alignment is approximately 11 km in length and comprises approximately 180 m of underground 132kV cable from the Carno III substation to cross under the existing 132kV overhead line that exits from the existing Carno Wind Farm Substation and then approximately 11 km 132kV single circuit overhead line on wood pole supports into the proposed NG substation. Approximately half of this connection will follow the route of a consented 132kV overhead line on wood pole supports which was brought forward to connect the consented Tirgwynt Wind Farm but is no longer required as the wind farm will now be connected via a 33kV underground cable. From the Carno III Wind Farm substation, the underground section crosses the existing 132kV overhead line which runs north east into the Afon Cledan valley. The route then runs parallel on the western side to the existing 132kV overhead line from the Carno Wind Farms I and II, avoiding residential properties which are located to the east. At the foot of the Afon Cledan valley, the route skirts the base of a wooded hill, avoiding ancient woodland. It is at this section that due to the proximity of the existing 132kV overhead line, it is proposed to divert this existing line over a distance of about 150 m and about 20 m to the east such that the new route follows the existing route to avoid the wooded area. The new route then continues to run parallel to the existing overhead line across the Carno valley, over the railway line and A470, and on to the opposite valley side.

2.31. Near Bron-haul, the existing overhead line turns sharply east, whilst the BSC Preferred Line Route Alignment would turn north, avoiding small stands of woodland, and moving on to the upper valley slopes on the west side of Cwm Llwyd. From this point, the route follows the line of the consented Tirgwynt wind farm connection, which crosses upland fringe, is routed well away from the wooded lower slopes of the valley, and avoids the highest ground further west.

2.32. The BSC Preferred Line Route Alignment follows the consented connection to Mynydd y Cwm, where it continues eastward, climbing through this side valley to reach the upland between the buffers identified around the wind turbine. It crosses the plateau, avoiding the highest ground, and descends into the head of the valley in which the proposed NG substation is sited.

CC Preferred Line Route Alignments

2.33. The CC Preferred Route Alignments are approximately 37.5 km in length and comprise the following Preferred Line Alignments:

2.34. **CC2** - approximately 3 km 132kV single circuit overhead line on a wood pole supports from the proposed Llanbadarn (Fynydd) Wind farm to the first part of the CC1 Preferred Line Route Alignment.

2.35. The CC2 route runs north-west from the Llanbadarn (Fynydd) Wind Farm substation across open pasture, below the higher moorland tops to the east and above the A483. The route turns to the west crossing the A483 and Camnant into the Ithon valley, which is relatively shallow at this point, to the 132kV/ 33kV Neuadd Goch Bank substation near Tyn-y-waun.

2.36. **CC4** - approximately 480 m 132kV single circuit overhead line on wood pole supports from the proposed Llaithddu Wind Farm to the CC1 Preferred Line Route Alignment.

2.37. CC4 is a short section of line which runs north from the Llaithddu Wind Farm substation at Banc Du to join CC1 as it runs through the upper Custogion Brook valley.

2.38. **CC1** - approximately 34 km 132kV single circuit overhead line on wood pole supports from the CC2 and CC4 Preferred Line Route Alignments to the proposed NG substation.

2.39. The CC1 route runs in a south westerly direction from the 132kV/ 33kV Neuadd Goch Bank substation near Tyn-y-waun across undulating higher land. The open landscape is contained by narrow shelter belts and is sparsely populated. It then drops down in a westerly direction from the higher land at Hirddywel, passing through an area of existing and proposed wind turbines and larger areas of plantation woodland. The route runs cross slope just below the highest land at Pegwyn Back, dropping down the steep scarp slope, which is scattered with a number of individual properties. The line continues to run west through the small Nant Feigion valley, contained by the valley sides and woodland blocks. The line turns to the north west, avoiding ancient woodland near Llwydiarth and running across more open undulating farmland.

2.40. The CC1 route continues to run north-west over a local spur of higher ground, cutting across the small pastoral fields to Newchapel. It continues in a northerly direction following a distinct and steep sided valley to the east of Llanidloes, enclosed on either side by plantation and ancient and semi-natural woodland. The valley is seldom visible in the wider landscape and is characterised by the surrounding plantation woodland which is felled in cycle to give a changing but working landscape. The route crosses the Severn Valley at right angles before running up the valley side to skyline locally south of Oakley Park.

2.41. The CC1 route runs down a gently sloping valley side, visually contained and backclothed by existing woodland to meet the Afon Trannon valley. The route runs across the valley floor following the line of the existing 33kV overhead line near Bwlchyllyn before turning to run north-west across the valley floor, turning north and passing to the immediate east of the Shooting Range to the north east of Trefeglwys. It is in this section that it is proposed to underground a section of the existing 33kV overhead line.

2.42. The CC1 route then runs up the gentle valley side to the north of the B4569, through a locally undulating landscape with a number of individual properties scattered in the landscape. The Colwyn Brook valley locally constrains the route alignment.

2.43. As the land rises from the Colwyn Brook valley, the landscape becomes more open and upland in character, with a larger scale. The route runs to the eastern edge of Mynydd Garth pwt with the steep hillside and associated woodland forming a backdrop the route before it turns to run around Allt y Genlli hillside to the west. The route then crosses the Carno valley (including the A470, railways line and Afon Carno) at right angles to the north west of Clatter near Pandy-bach.

2.44. The route runs along the raised valley side, crossing small fields bounded by ancient semi natural woodland, running slightly to the south of the existing 132kV overhead line from the Carno Wind Farms I and II and through a small area of ancient woodland. It then turns north to follow the narrow and contained Cwm Cra valley, the steep sides of the valley further contained by the existing woodland before rising towards the higher land.

2.45. The route turns north east to follow the small valley up to the higher land, turning north to run to the east of Blaen-y-Cwm and Carneddau, crossing the local road to the west of the quarry and then over the open moorland to the proposed NG substation.

Line Design

2.46. The majority of the 132kV connections will be single circuit overhead lines on wood pole structures. This design suits the character of the rural landscape and is less visually intrusive, less visible on the skyline and more flexible for detailed routeing, providing a better fit with the landscape.

2.47. The type of wood pole structures is subject to ongoing detailed design but is likely to include a combination of what are known as the Heavy Duty Wood Pole and Trident designs. As the design progresses and is finalised, further clarification of the wood pole structure designs to be used will be provided within the Preliminary Environmental Information Report (PEI Report) and ES.

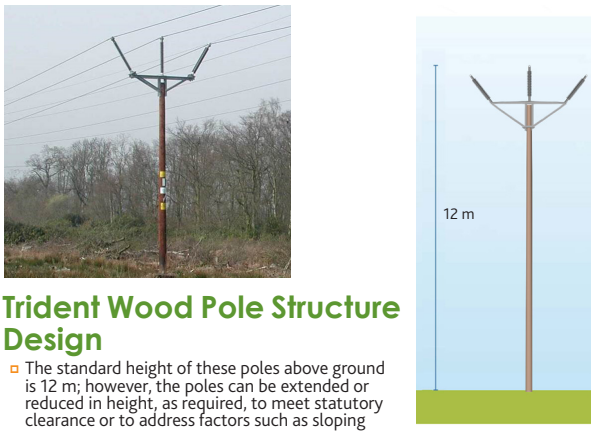
2.48. A limited number of steel towers (L7 design) will be required to support an approximately 4 km section of double circuit line within the BNC Preferred Line Route Alignment (BNC5). Steel towers offer less scope for sensitive routeing and are more suited to expansive, larger scale, relatively flat landscapes. Their longer spans make them useful for crossing protected areas.

2.49. Generic specification drawings for a Heavy Duty Wood Pole (HDWP), a Trident wood pole, and an L7 steel tower are provided below.

CHOICE OF TECHNOLOGY

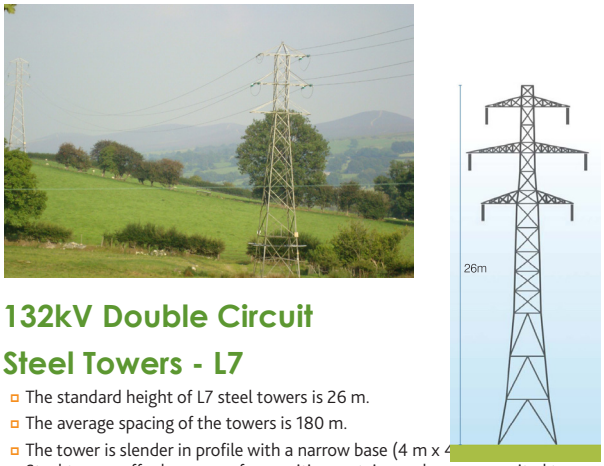
Heavy Duty Wood Pole Structure Design

- The standard height of these poles above ground is 14 m; however, the poles can be extended or reduced in height, as required, to meet statutory clearance or to address factors such as sloping ground.
- The poles carry three cables with an additional earth wire.
- Steelwork and insulators to support the conductors will be fitted on top of the poles.
- The average spacing of the wood pole structures will be approximately 100 m



Trident Wood Pole Structure Design

- The standard height of these poles above ground is 12 m; however, the poles can be extended or reduced in height, as required, to meet statutory clearance or to address factors such as sloping ground.
- The poles carry three cables.
- Steelwork and insulators to support the conductors will be fitted on top of the poles.
- The average spacing of the poles will be approximately 130 m.



132kV Double Circuit Steel Towers - L7

- The standard height of L7 steel towers is 26 m.
- The average spacing of the towers is 180 m.
- The tower is slender in profile with a narrow base (4 m x 4
- Steel towers offer less scope for sensitive routeing and are more suited to expansive, relatively flat landscapes. Their longer spans make them useful for crossing steep sided valleys which would be too steep for wood poles.

Undergrounding

- Underground 132kV cables will comprise stranded copper cross-linked polyethylene (XLPE) insulation. This type of cable is chemically inert and does not contain any fluids.
- The cables will be laid within separate polyethylene ducts in trenches of approximately 1 m x 1 m x 1 m per connection.

Construction Working Areas and Access

2.50. Within and extending out from the Preferred Line Route Alignments will be the integral overhead line construction working areas and access for the construction, and new access from existing access tracks and roads. Construction of the Proposed Development will include:

- *Vegetation clearance and ground preparation works;*
- *Delivery of construction materials;*
- *Erection of wood pole supports/ towers;*
- *Undergrounding;*
- *Delivery of conductor drums and stringing equipment;*
- *Insulator and conductor erection and sagging; and*
- *Ground reinstatement.*

TYPICAL CONSTRUCTION PROCESS






Ground Preparation and Clearance Works

2.51. A programme of vegetation clearance and ground preparation works will be undertaken prior to the start of construction works at any given location. This programme of works is likely to be phased over the construction programme to avoid key breeding seasons of fauna and to minimise the time that areas of bare ground are exposed.

2.52. Where the connection passes over or in close proximity to trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned prior to construction.

Temporary Construction Areas and Accesses for Delivery of Construction Materials and Erection of Wood Pole Supports /Towers

2.53. A temporary integral construction works corridor will be established approximately 15 m either side of the Preferred Line Alignment that sits within each Preferred Line Route Alignment and additional integral construction areas will be required along the Preferred Line Alignment for the storage and dispersal of plant and equipment.

2.54. A number of integral accesses from the public highway into the construction works corridor, which will sit within each Preferred Line Route Alignment, will be required throughout the construction period. Such integral construction accesses will utilise a combination of existing roads (where practicable) and temporary trackways, comprising metal plates or hardcore of approximately 5 m in width.

2.55. The indicative locations of the temporary construction areas and accesses are illustrated in Figure 2 (Appendix A); however, final construction arrangements will be subject to agreement between the contractor and the landowners.

Underground Cables

2.56. The underground cables will be laid in polyethylene ducts typically at a depth of 1 m below ground level in a trench typically 1 m wide.

2.57. An overall working corridor width of 15-20 m will be required for the installation of an underground cable.

2.58. Topsoil excavated from the cable trench will be stored separately from other material from the trench. Once the cable has been laid and the initial backfilling has taken place the excavated topsoil will be used to complete the backfilling.

Reinstatement

2.59. Following completion of the works, areas of ground disturbed by the construction works will be reinstated. Subject to programme requirements, some sections of the construction may be reinstated earlier than the final construction completion.

Mitigation

2.60. Mitigation of potential environmental impacts will be considered throughout the detailed design phase of the Proposed Development and will be informed by the EIA Process and consultation feedback. It is likely that mitigation will include measures such as screen planting and habitat enhancement.

2.61. For the purposes of this EIA Scoping exercise it has been assumed that the land required for integral mitigation will be located within the Indicative DCO Site Boundary.

Operation and Maintenance

2.62. In general, 33kV and 132kV overhead lines require very little maintenance. They are regularly inspected to identify any unacceptable deterioration of components so that they can be replaced.

2.63. Once an underground cable is laid, generally no maintenance is required; however; in the event that it becomes damaged or a fault occurs, it may be necessary to expose the cable to carry out a repair.

2.64. The operational requirements of the local electrical network and associated demand would be kept under continuous review throughout the life of the Proposed Development, in order to determine the long term use and retention of the connection, prior to any decommissioning decision being taken. Operation is anticipated to last 40 years or more and experience indicates that a new connection of this type would require refurbishment after approximately 40 years, depending upon local environmental factors (e.g. local weather conditions).

Decommissioning

2.65. When the useful life of the Proposed Development has expired, the connection can be removed. A similar process as required for construction will be undertaken in reverse for the removal. The ground will be reinstated to as near to pre-construction conditions as practicable and material derived from site will be recycled wherever possible

Indicative Programme for the Proposed Development

2.66. It is currently anticipated that (subject to consents being granted) work on site will commence in 2016. Construction is anticipated to take approximately three years. The construction phase is therefore anticipated to be completed and the Proposed Development operational in 2019.

2.67. This programme may, however, be influenced by the progress of the DCO application, consents for the Associated Development and Related Development, and construction methodologies/ availability of project resources.

3.0 CONSULTATION

SP MWC Project Consultation

3.1. As part of the SP MWC Project, SP Manweb initiated a programme of consultation with statutory consultees, stakeholders, and the local community in March 2011. This consultation has been undertaken utilising a number of methods, including; publications, community briefings, public exhibitions, newsletters, a project-specific website, media and flyers, telephone, letters and feedback forms.

3.2. The consultation process to date has occurred in three stages:

- *Consultation Stage One (March to March 2012) - SP Manweb presented and consulted on possible corridors for connections.*
- *Consultation Stage Two (July 2012 to September 2013) - SP Manweb presented and consulted on the Preferred Route Corridors.*
- *Consultation Stage Three (October 2013 to March 2014) - SP Manweb presented and consulted on the 'Suggested Line Routes' and the collector substation site options*[3].

3.3. In tandem with the community consultation process, SP Manweb has engaged with a number of statutory bodies, including: the Planning Department at (PCC), Natural Resources Wales (NRW), Cadw (Welsh Government's historic environment service), Royal Commission Ancient and Historic Monuments in Wales, Clwyd-Powys Archaeological Trust (CPAT) and the Welsh Government.

3.4. A complete list of the bodies consulted to date is included in the Revised Consultation Strategy (Revised Statement of Community Consultation) (September 2013).

3.5. SP Manweb's consultation process has fed into the ongoing design process and has therefore enabled SP Manweb to avoid potentially significant environmental effects. The way in which consultation feedback has influenced the design of the SP MWC Project is described in the published documents, in particular the Line Routeing Methodology & Appraisal – Phase 3 Report (September 2013).

3.6. There is a dedicated project website for the SP MWC Project (www.spmidwalesconnections.info) and this provides information about the consultation process.

3.7. A number of project documents, which report the findings of the routeing and consultation process, have been published by SP Manweb and these are available to download from the project website[4]. A list of the published documents, some of which related to environmental issues, is provided in Table 1.2 (see Chapter 1 of this Scoping Report).

3.8. SP Manweb plans to continue the SP MWC Project consultation process by undertaking two further stages of consultation in 2014, comprising:

- *Consultation Stage Four – at the same time as this EIA Scoping Report is being issued, the Preferred Line Alignments and Preferred Line Route Alignments are being published and presented to the local community, relevant prescribed statutory consultees (e.g. NRW) and PCC.*
- *Consultation Stage Five – this consultation stage is scheduled to take place in autumn 2014 and will comply with the requirements of the Planning Act 2008. This will include presentation of and consultation on the Proposed Line Alignments and Proposed Line Route Alignments to the local community, relevant prescribed statutory consultees (e.g. NRW) and PCC.*

3.9. SP Manweb intends to publish a revised and final statutory SoCC in accordance with Section 47 of the Planning Act 2008 (Ref. 1-4) as part of Stage Five, which will detail how SP Manweb will conduct the final, statutory community consultation on the Project (as required under Section 47 of the Planning Act 2008) and how SP Manweb intends to consult the local community. The finalised document containing the SoCC will be made available to download from the project website. The final, statutory consultation on the SP MWC Project will then be carried out in accordance with the SoCC, s42 and s48 of the Planning Act 2008.

3 The collector substation is referred to in this EIA Scoping Report as the '132kV/ 33kV substation and it forms part of the Associated Development.
4 http://www.spmidwalesconnections.info/english/downloads/

EIA Related Consultation

3.10. The SoS has a duty (under Regulation 9 of the EIA Regulations), to notify the selected prescribed and non-prescribed consultation bodies that an ES will be submitted, and to provide SP Manweb with a list of the notified consultation bodies and persons.

3.11. Consultation is critical to the development of a comprehensive and balanced EIA. This scoping process forms the first stage of statutory EIA consultation and is aligned with SP Manweb's wider SP Manweb MWC Project Consultation Stage Four (see above).

3.12. In tandem with the formal EIA Scoping consultation process, the EIA team has commenced engagement with a number of statutory consultees, including:

- *Consultation with NRW regarding the scope of the ecology and ornithological assessment;*
- *Consultation with NRW regarding the methodology for the field based landscape sensitivity assessment and viewpoint locations proposed for the Landscape and Visual Assessment; and*
- *Consultation with NRW, Cadw and PCC regarding the scope of the cultural heritage and archaeology assessment.*

3.13. Further discussions will be held with the statutory consultees and other third parties throughout the EIA process as necessary. This will include direct liaison with the developers of the Related Developments listed in Chapter 1 of this EIA Scoping Report, the intention being to obtain and share available survey data and environmental information where possible.

3.14. The views of the statutory consultees and third parties articulated through the formal EIA Scoping Process and other consultations, including the Stage Four and Five SP MWC Project consultations, will serve to focus the environmental studies, collate baseline environmental data, identify specific environmental issues which require further investigation, influence the detailed design, and determine appropriate mitigation measures.

PEI Report

3.15. During Consultation Stage Five, preliminary environmental information pertinent to the Proposed Development will be presented in a 'PEI Report'. As set out in Planning Inspectorate Advice Note 7: 'EIA Screening, Scoping and Preliminary Environmental Information' (Ref. 1-7), the purpose of the PEI Report is:

"to enable the local community to understand the environmental effects of the proposed development so as to inform their responses regarding the proposed development".

Presentation of the Consultation Undertaken

3.16. A summary of all EIA related consultation undertaken up to the point of submission will be provided in the PEI Report and the ES that is submitted as part of the suite of documents accompanying the application for development consent for the Proposed Development.

4.0 ENVIRONMENTAL IMPACT ASSESSMENT: SCOPE AND PROCESS

Introduction

4.1. The EIA of the Proposed Development will be carried out in accordance with the requirements for the contents of an ES as set out in Schedule 4 of the EIA Regulations (Ref. 1-6).

4.2. For the EIA to be an effective decision-making tool, the ES needs to focus on the likely significant environmental effects of a project. In order to ensure the ES is a useful and focussed document, the scoping process will be used to agree the issues and topics which should be considered and assessed for likely significant environmental effects. These issues and topics will be identified through consideration of the planning context, preliminary data review and consultation with statutory and non-statutory consultees.

4.3. The EIA will be carried out through a number of related activities, as follows:

- *Determination of the EIA Study Areas;*
- *Establishing the baseline conditions;*
- *Consultation with statutory and non-statutory consultees;*
- *Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;*
- *Consideration of technical standards for the development of significance criteria;*
- *Design review;*
- *Review of secondary information, previous environmental studies, publicly available information and databases;*
- *Consideration of specialist opinion;*
- *Physical surveys and monitoring;*
- *Desk-top studies;*
- *Modelling (where applicable); and*
- *Reference to current guidance in relation to sustainability.*

4.4. The ES (Main Report) will set out the process followed during the EIA, including the methods used for the collection of data and for the identification and assessment of impacts. Any assumptions made will be clearly identified.

4.5. In addition, the ES will provide details of the Proposed Development programme together with specific construction activities and their anticipated duration. The ES will also describe the likely content of the Construction Method Statement (CMS), which will detail the specific mitigation measures to be followed to reduce nuisance impacts that may result from construction traffic; noise and vibration; utilities diversion; dust generation; soil removal; and waste generation.

4.6. The EIA process is designed to be capable of, and sensitive to, changes that occur as a result of changes to the design, including any mitigation measures that result from the EIA process. This will be particularly important for this development as the route of the connections is still being refined and changes are likely to be made following submission of this EIA Scoping Report. In this way the EIA, consultation and design processes are interlinked and iterative in nature.

4.7. Where any particular design consideration has not yet been finalised, for example to allow flexibility for finalisation of the proposed NG substation, this will be explained and justified in the ES and the boundaries of the design parameter will be provided and assessed accordingly.

Routeing Evolution and Alternatives

4.8. The EIA is an iterative process that feeds back into the design of a proposed development to enable the developer to avoid the potential for adverse environmental impacts to occur and/ or design inbuilt mitigation and environmental enhancements. The ES provides an opportunity to describe the design evolution of the Proposed Development as well as consideration of any alternative development options before a final decision is taken on the design of the SP MWC Project.

4.9. The alternative network and routeing options considered to date have been set out in the project reports referred to above in Table 1.2 (Chapter 1).

4.10. The ES will summarise the evolution of the proposals, the modifications to the design that were undertaken, and the environmental considerations which led to those modifications. In doing so, the ES will provide a record of the alternatives that were considered, including:

- *'Do Nothing Scenario' – the consequences of no development taking place;*
- *'Alternative routes' – examination of the alternative routes that were considered and the rationale behind the selection of the Proposed Line Route Alignments; and*
- *'Alternative line design' – a discussion of the alternatives in terms of overhead lines and underground cables and the rationale behind the selection of the preferred approach and designs.*

4.11. The ES will also summarise relevant comments received through consultation and summarise where design aspects have been influenced by the consultation process.

Key Environmental Issues

4.12. Based on a high-level evaluation of the baseline environmental information for the site and surrounding area, it is considered that there is the potential to impact upon the environment in a variety of ways.

4.13. During the construction phase the potential impacts are likely to include:

- *Disturbance/ loss of habitats and protected species;*
- *Landscape impacts;*
- *Views and residential amenity impacts;*
- *Cumulative landscape and visual impacts;*
- *Impacts on cultural heritage sites/ features;*
- *Impacts on hydrology (including water quality, hydromorphology and groundwater);*
- *Impacts on and of flood risk;*
- *Socio-economic impacts;*
- *Impacts on land use (including soils);*
- *Traffic and transport impacts;*
- *Noise impacts on human health and ecological assets;*
- *Air quality impacts on human health ecological assets; and*
- *Cumulative impacts.*

4.14. During the operation phase the potential impacts are likely to include:

- *Disturbance/ loss of habitats and protected species;*
- *Landscape impacts;*
- *Impacts on views and residential amenity;*
- *Impacts on historic environment;*
- *Impacts on the setting of cultural heritage sites/ features;*
- *Impacts on and of flood risk;*
- *Socio-economic impacts;*
- *Impacts on land use (including soils);*
- *Impacts on health from electric magnetic fields (EMF); and*
- *Cumulative impacts.*

4.15. Furthermore, where a particular receptor or group of receptors is affected by more than one type of impact, there may be a combined effect.

Proposed Technical Scope of the EIA

4.16. Given the identified key environmental issues listed above, it is proposed that the EIA should include the following technical topics:

- *Planning Policy;*
- *Biodiversity and Ecology;*
- *Landscape and Visual;*
- *Historic Environment and Cultural Heritage;*
- *Flood Risk and Hydrology;*
- *Socio-Economics;*
- *Land Use;*
- *Noise and Vibration;*
- *Traffic and Transport;*
- *Electric and Magnetic Fields; and*
- *Cumulative Effects; (including in-combination effects).*

4.17. Chapters 5 – 16 of this EIA Scoping Report provide a justification for the inclusion and exclusion of particular EIA topic areas and outline a proposed scope for the assessments to be undertaken and reported in the ES.

EIA Study Areas

4.18. The extent of the Study Area for the EIA is not a fixed width buffer, but is tailored at the outset to cover the area over which there may be significant environmental effects.

4.19. The environmental baseline is described differently across the spectrum of EIA disciplines (e.g. noise, water resources, ecology) because the environmental features and receptors can vary from theme to theme. The spatial extent of the environmental baseline also differs for each discipline as a result of the varying extents/ ranges of potential impacts caused by a development.

4.20. The proposed EIA Study Areas are based upon the Indicative DCO Site Boundary (defined above). Appropriate spatial buffers have been applied to the edge of the Indicative DCO Site Boundary to determine the extent of the various EIA Study Areas required for each EIA discipline (and sub-topics therein). Details of the topic-specific EIA Study Areas are provided within Chapters 7 – 15 of this EIA Scoping Report.

4.21. The ES will include details of each of the EIA Topic-specific Study Areas in the assessment methodology section of the corresponding ES Chapter.

Baseline Conditions

4.22. In order to assess the likely significant effects, it is necessary to determine the environmental conditions that currently exist within the topic-specific EIA Study Areas. These are known as 'baseline conditions'.

4.23. Baseline conditions will be determined using the results of onsite surveys and investigations or desk based data searches, or a combination of these, as appropriate, and as set out within Chapters 6 – 16 of this EIA Scoping Report.

Assessment Methodology and Significance Criteria

4.24. The specific assessment methods to be used to identify and assess the likely significant environmental effects are discussed in Chapters 5 – 15 of this EIA Scoping Report.

4.25. The assessment will include the following scenarios:

- *The Site as existing (the baseline);*
- *The Proposed Development; and*
- *Cumulative effects of the Associated Development, Related Developments and any other relevant proposed or consented schemes.*

4.26. Impacts will be considered on the basis of their magnitude, duration and reversibility. Cumulative and combined effects will also be considered where appropriate. Significance will be evaluated on the basis of the scale of the impact and the importance or sensitivity of the receptors, in accordance with standard assessment methodologies (major, moderate, minor and negligible).

4.27. The ES will describe the assessment of the direct effects in addition to potential effects that are:

- *Indirect;*
- *Cumulative;*
- *Short, medium and long term;*
- *Permanent or temporary;*
- *National, regional or local in scale; and*
- *Beneficial and/ or adverse in nature.*

4.28. The methods used in undertaking each of the technical studies are outlined within Chapters 5 – 15 of this EIA Scoping Report, with references to published standards (e.g. British Standards, Building Research Establishment), guidelines (e.g. Design Manual for Roads and Bridges and Institute of Environmental Management & Assessment Guidelines) and relevant significance criteria.

4.29. The significance of residual impacts that remain after taking into account mitigation measures will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it is not been possible to quantify impacts, qualitative assessments will be carried out, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical assessment chapter.

4.30. Specific criteria for each technical assessment will be developed, giving due regard to the following:

- *Extent and magnitude of the impact;*
- *Impact duration (whether short, medium or long term);*
- *Impact nature (whether direct or indirect, reversible or irreversible);*
- *Whether the impact occurs in isolation, is cumulative or interactive;*
- *Performance against environmental quality standards;*
- *Sensitivity of the receptor; and*
- *Compatibility with environmental policies and standards.*

4.31. For issues where definitive quality standards do not exist, significance will be based on the:

- *Local, district, regional or national scale or value of the resource affected;*
- *Number of receptors affected;*
- *Sensitivity of these receptors; and*
- *Duration of the impact.*

4.32. In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA, and thereby enable comparison between impacts on different environmental components, the following terminology will be used in the ES:

Adverse	Detrimental or negative effects on an environmental resource or receptor; and
Beneficial	Advantageous or positive effects on an environmental resource or receptor.

4.33. Where adverse or beneficial effects have been identified, these have been assessed against the following scale:

Negligible	Imperceptible effects on an environmental resource or receptor;
Minor	Slight, very short or highly localised effect of no significant consequence;
Moderate	More than a slight, very short or localised effect (by extent, duration or magnitude) which may be considered significant; and
Major	Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

4.34. For the purpose of the EIA, moderate and major effects will generally be deemed to be 'significant'.

4.35. Each of the technical chapters will provide the criteria, including sources and justifications, for quantifying the different levels of effect. Where possible, this will be based upon quantitative and accepted criteria, together with the use of value judgement and expert interpretation to establish to what extent an effect is environmentally significant.

Mitigation

4.36. The mitigation measures envisaged in order to prevent, reduce or where possible offset significant adverse effects will be described where applicable and assessed as appropriate.

Residual Effects

4.37. The concluding chapters will provide a summary of residual significant effects taking into account mitigation measures. The significance of residual effects will be defined in accordance with a standard set of significance criteria.

Assessment of Cumulative Effects

4.38. In accordance with the EIA Regulations, consideration will be given to the potential for 'cumulative impacts' to arise. Cumulative impacts are those that accrue over time and space from a number of development activities.

4.39. Impacts will be considered in conjunction with the potential impacts from other proposed projects or activities in the area, which are not part of the existing baseline.

4.40. Additionally, the ES will contain an assessment of cross-disciplinary effects that may occur as a result of the Proposed Development.

4.41. The proposed scope of the cumulative assessment is outlined in Chapter 5 of this EIA Scoping Report.

Proposed Structure of the Environmental Statement

4.42. Subject to confirmation of the EIA scope, it is proposed that the ES will comprise the following set of documents:

4.43. **EIA Non-Technical Summary (NTS)** - This document will provide a summary of the key issues and findings of the EIA. The NTS will be presented in non-technical language to assist the reader to understand the site context, the Proposed Development, the design alternatives, the environmental issues arising, and proposed mitigation measures and any potential likely residual significant effects.

4.44. **Volume I: Environmental Statement (Main Report)** - This will contain the full text of the EIA with the proposed chapter headings as follows:

- *Introduction – including general background information, the legislative requirements of the EIA, description of the site and surroundings, details of SP Manweb making the planning submission and the environmental assessment team;*
- *Approach to EIA – detailing the methodologies employed as part of the EIA and any issues agreed to be scoped out;*
- *The Proposed Development;*
- *Alternatives and Design Evolution;*
- *Planning Policy;*
- *Biodiversity and Ecology (ornithology may be provided as a separate chapter);*
- *Landscape and Visual;*
- *Historic Environment and Cultural Heritage;*
- *Flood Risk and Hydrology;*
- *Socio-Economics;*
- *Land Use;*
- *Noise;*
- *Traffic and Transport;*
- *Electric and Magnetic Fields;*
- *Cumulative (including cross-disciplinary) Effects;*
  - *Associated Development;*
  - *Related Development;*
  - *Other Relevant Development; and*
- *Summary of Significant Residual Effects and Conclusions.*

4.45. **Volume II: Figures and Plans** - This volume of the ES will provide the figures, drawings and photographs referred to in ES Volume I.

4.46. **Volume III: Technical Appendices** - This volume of the ES will provide supplementary details of the environmental studies conducted during the EIA, including relevant data tables.

4.47. **Volume IV: Technical Annexes** - This volume of the ES will contain details of supplementary environmental reports (e.g. Neuadd Goch Bank Wind Farm Environmental Report, Tree Survey Report).

4.48. **Volume V: Confidential Technical Annexes (confidential ecological reports)** - This volume of the ES will provide details of the ecological surveys undertaken which are required to remain confidential. Confidential appendices will be made available to the relevant parties only.

5.0 CUMULATIVE EFFECTS

Introduction

5.1. The EIA of the Proposed Development will consider the potential for significant cumulative effects to arise.

5.2. There are many definitions of cumulative effects[5] depending on the context in which the term is applied. For the purposes of this EIA we identify cumulative effects as the additional effects which may occur when the Proposed Development is considered in conjunction with the potential effects from other relevant development or activities in the area which are not part of the existing baseline.

Scope of Assessment

5.3. Cumulative effects arising from different elements of a project on environmental receptors (intra-project effects) and from projects combined with other activities (inter-project) effects are commonly identified. There is no definitive view on the scope of activities to be included within inter-project assessments to ensure that cumulative effects are properly considered. It is a matter of professional judgement to ensure the relevant projects and activities - and their environmental effects - are identified, taking into account the circumstances of the Proposed Development and its location.

5.4. As outlined in Chapter 1 of this EIA Scoping Report, the SP MWC Project incorporates within it the Proposed Development (the NSIP development for which the DCO Application will be made) and the Associated Development that does not form part of the NSIP. In addition, there is Related Development – development that is closely linked in commercial and design terms to the SP MWC Project.

5.5. The Associated Development and Related Development will be considered within the EIA of the Proposed Development in order to appropriately assess the cumulative effects of the Proposed Development.

5.6. Other Relevant Development within the planning system will also require to be assessed cumulatively with the SP MWC Project. The Other Relevant Developments considered within the assessment of cumulative effects will be discussed and agreed with the relevant statutory consultees (including PCC) at the commencement of the assessment and will be periodically reviewed.

5.7. Schemes at pre-planning stage will not be included within the cumulative effects assessment unless they are in the public domain as part of a public consultation exercise or identified through discussions with PINS, PCC and other statutory consultees as potentially significant.

5.8. In summary, the following developments are proposed to be considered in the assessment of cumulative effects:

- *The Associated Development (as described in Chapter 1);*
- *The Contracted Wind Farms (Related Development):*
  - *Dyfnant Forest Wind Farm;*
  - *Mynydd Lluest y Graig Wind Farm;*
  - *Llanbrynmair Wind Farm;*
  - *Carnedd Wen Wind Farm;*
  - *Carno III Wind Farm;*
  - *Llaithddu Wind Farm;*
  - *Llanbadarn (Fynydd) Wind Farm;*
  - *Neuadd Goch Bank Wind Farm;*
- *The proposed NG 400kV/132kV substation (Related Development);*
- *The proposed NG 400kV connection (Related Development);*
- *Llandinam 132kV Overhead Line Connection from Llandinam Wind Farm to Welshpool Substation (Other Relevant Development); and*
- *Any other reasonably foreseeable proposed developments considered by PINS, PCC and other statutory consultees as potentially significant (Other Relevant Development).*

5 For the purpose of this EIA, the term 'cumulative effects assessment' is used to define both the cumulative assessment required by the Environmental Impact Assessment (EIA) Regulations and the "in-combination" assessment required by the Habitats Regulations. In some cases different meanings have been assigned to the terms "cumulative" and "in-combination", although there is no basis for this in the legislation. While EIA legislation uses one term and the Habitats Regulations use another, the requirements to take account of the effects of other permissions, plans or projects which may add to or act with the effects of the proposed development on a particular receptor is the same in both cases, the only differences being in the procedures and the different terms used. Therefore, for the purposes of this EIA, we will use the term "cumulative effects assessment" to cover the process referred to in the various regulations as assessment of cumulative, combined or in-combination effects.

5.9. The locations of the developments listed above are illustrated in Figure 3 (Appendix A).

Approach to Assessment

5.10. The proposed approach to the cumulative assessment of the Proposed Development is to undertake the assessment in three stages:

- *Stage 1 - Cumulative assessment of the Proposed Development and the Associated Development;*
- *Stage 2 - Cumulative assessment as described in Stage 1 plus the Related Development; and*
- *Stage 3 - Cumulative assessment as described in Stage 2 plus Other Relevant Development.*

Assessment Method

5.11. Assessment methods for cumulative impacts and interactions vary depending on the topic. The cumulative effects of the proposed development will be assessed within each technical chapter using the appropriate methodology.

5.12. The environmental effects of the Developments considered within the EIA Cumulative Assessment will be determined through a review of publicly available consent application and consultation documents for each development (e.g. Environmental Statements and EIA Scoping Reports).

Assessment of the Associated Development

5.13. As noted in Chapter 1 of this EIA Scoping Report, it is not expected that the Associated Development, will require a formal EIA; however, SP Manweb intends to undertake an environmental appraisal of the Associated Development and produce an Environmental Report to inform the relevant consent applications. If the Environmental Report is not publicly available at the time of publication of the EIA of the Proposed Development, the environmental information relevant to the EIA Cumulative Assessment of the Associated Development will be provided as a Technical Annexe to the EIA.

Mitigation

5.14. Where significant cumulative effects are identified, mitigation measures to prevent, reduce or where possible offset significant adverse effects will be described in the Cumulative Effects ES Chapter.

Residual Effects

5.15. The concluding section of the Cumulative Effects ES Chapter will summarise the significant residual cumulative effects of the Proposed Development. For the purposes of the assessment only moderate and major cumulative effects will be considered significant.

6.0 PLANNING POLICY CONTEXT

Introduction

6.1. A chapter on planning policy will be included within the ES to provide a general overview of the national, regional and local planning policy framework of direct relevance to the Proposed Development and will provide a detailed examination of specific policies that relate to the proposals.

6.2. The ES will also refer to relevant guidance, policy and legislation in each technical chapter. A detailed interpretation of policies and relevant guidance and legislation relating to technical aspects of the EIA will be discussed specifically within each technical chapter of the ES.

6.3. The ES will not include an assessment against National Policy Statements and other relevant and important considerations as this would inevitably involve a degree of subjective interpretation, which is contrary to advice on ES preparation, including good practice guidance on EIA which states that discussions of planning policy in an ES must be objective (Ref. 6-1). Instead, a planning policy assessment will be provided in a Planning Statement which is a separate document that will form part of the Development Consent Order application for the Proposed Development.

Planning Act 2008

6.4. The Proposed Development falls within the definition of an NSIP under Sections 14 (1)(b) and 16 (1)(b) of the Planning Act 2008 (Ref. 1-4) because it is a proposal for the development and operation of an electric line above ground that will have a voltage capacity at or above 132kV. As such, a Development Consent Order (DCO) is required to authorise the Proposed Development under Section 31 of the Planning Act.

National Policy Statements

6.5. The SoS and PINS consider DCO applications in accordance with relevant National Policy Statements (NPS) designated under the Planning Act 2008. The NPSs set out national policy in relation to specified descriptions of development. A number of NPSs in relation to energy infrastructure (including technology specific NPSs) were designated by the SoS for the Department of Energy and Climate Change (DECC) and Parliament in July 2011. The NPSs that are relevant to the Proposed Development are:

- *Overarching NPS for Energy (EN-1) (Ref. 6-2); and*
- *NPS for Electricity Networks Infrastructure (EN-5) (Ref. 6-2).*

6.6. EN-1, in combination with the relevant technology specific NPSs provides the primary basis for decisions by the SoS on energy related NSIPs. In making a decision, the SoS must also have regard to any local impact report submitted by a relevant local authority, as well as other matters which the SoS considers both important and relevant to the decision. These may include local development plan documents (DPDs) and Planning Policy Wales. Such policies are referred to below on this basis. The NPSs provide guidance on assessment principles and identify a number of generic impacts relating to energy infrastructure that applicants should consider in preparing their application and which the SoS should consider when determining applications.

6.7. The SoS is required to determine applications in accordance with policy set out in the relevant NPSs, except for where this would lead to the UK being in breach of any of its international obligations; the decision would be in breach of any statutory duty that applies to examining or decision making; be unlawful; result in adverse impacts outweighing the benefits; or be contrary to regulations about how decisions are to be taken.

6.8. The EIA will address the requirements set out in EN-1 and EN-5. In particular, the scope will take account of EN-1 Part 4 'Assessment Principles' and Part 5 'Generic Impacts' and EN-5 Part 2. The latter addresses matters which will be considered in the EIA on a topic-by-topic basis, including specifying what is required in terms of both an 'applicant's assessment' and 'decision making' and 'mitigation'.

Welsh National Planning Policy

6.9. In Wales, planning policy comprises both national (Welsh) and local policy documents. At a national level, the 2008 Wales Spatial Plan (WSP) (Ref. 6-4) provides a Wales-wide spatial strategy which sets out policies in relation to the development and use of land in Wales over a twenty year period. It notes that a significant challenge is the ability to play not only a local but also a national role in responding and adapting to the impact of climate change.

6.10. Planning Policy Wales (Edition 6, February 2014) (PPW) (Ref. 6-5) provides the land use planning policies of the Welsh Government and is supplemented by a series of 22 topic based Technical Advice Notes (TANs). PPW and the TANs, together with circulars and policy clarification letters, comprise national planning policy in Wales.

6.11. Chapter 4 of PPW outlines the Welsh Government's objectives for planning for sustainable development including planning to minimise the causes of climate change. Paragraph 4.5.7 of PPW states that planning policies and proposals should take:

6.12. "...decisive action to move towards a low carbon economy by... facilitating the delivery of new and more sustainable forms of energy provision at all scales... and minimising the emission of greenhouse gases to the atmosphere".

6.13. With respect to energy, the Welsh Government is committed to reducing carbon emissions and contributing to the delivery of the UK's commitment to securing 15% of energy from renewables by 2020 (paragraph 12.8.1 PPW). It encourages local planning authorities to facilitate the development of all forms of renewable and low carbon energy to move towards a low carbon economy (paragraph 12.8.9 PPW). It also notes at paragraph 12.8.12 that:

6.14. "...the need for wind energy is a key part of meeting the Welsh Government's vision for future renewable electricity production as set out in the Energy Policy Statement (2010) and should be taken into account by decisions makers when determining such applications".

6.15. In relation to planning for renewable energy development and associated 'grid' infrastructure at a local level, paragraph 12.8.14 of PPW states that:

6.16. "an integrated approach should be adopted towards planning renewable and low carbon energy developments and additional electricity grid network infrastructure. Additional electricity grid network infrastructure will be needed to support the SSAs [Strategic Search Areas] and local planning authorities should facilitate grid developments when appropriate proposals come forward whether or not the wind farms to be connected are located within their authorities."

Local Planning Policy

6.17. Local planning policy across Powys (excluding Brecon Beacons National Park area) is provided by the Powys Unitary Development Plan (UDP) (adopted 1st March 2010) (Ref. 6-6). The UDP provides strategic (county-wide) policy (Part 1) and detailed development control and site/ topic specific policies (Part 2), intended to guide development and planning decisions across Powys over the course of the plan period (up to 2016).

Unitary Development Plan (UDP) - Part 1 Policies

6.18. Policy SP1 seeks to safeguard the social, community and cultural sustainability of Powys by requiring SP Manweb to give due regard to the need to sustain and where possible enhance the social, cultural and linguistic characteristics of the area and to the contribution that the proposals can make towards meeting the needs of local communities and residents.

6.19. Policy SP3 seeks to safeguard the natural heritage of Powys, through expecting development proposals to take account of the need to protect, conserve and wherever possible enhance the aesthetic, amenity, biodiversity, ecological, geological, nature conservation, physio-graphical and scientific value of sites and features of importance including those of archaeological, architectural, heritage conservation and historic interest.

6.20. Policy SP10 concerns protection of minerals developments and includes that, where valuable mineral resources exist, they will be safeguarded from sterilisation resulting from alternative development.

6.21. Policy SP14 concerns development in flood risk areas and proposes that development would not be permitted within an area of high risk of flooding unless it is of strategic importance and that the consequences of any flooding would be acceptable and that it would not give rise to any unacceptable flooding impacts elsewhere. For such developments to be permitted, the UDP seeks that they ensure provision of appropriate and environmentally sympathetic flood mitigation and/ or compensatory measures.

6.22. There are many mineral allocation sites (termed mineral buffer zones) identified within the Powys UDP. Policy MW22 states that all proposals that are likely to be incompatible with the adjacent mineral operation will:

6.23. *"form the subject of rigorous examination and proposals that would be unacceptably adversely affected or prejudice the mineral working operations will be refused".*

6.24. Unitary Development Plan (UDP) - Part 2 Policies

6.25. UDP Part 2 includes a number of environmental protection planning policies, including Policy ENV1 which aims to preserve the best and most versatile agricultural land from development.

6.26. Policy ENV2 requires that any development should take account of high quality landscape and be appropriate and sensitive to the character and landscape of Powys.

6.27. Policy ENV3 seeks to maintain biodiversity and amenity value of habitats and features across the county. Policy ENV4 identifies that proposals for development that may affect internationally important sites will only be permitted where they will not significantly affect the achievement of the conservation objectives for which the site is designated.

6.28. Policy ENV5 states that there will be a presumption against proposals likely to damage, either directly or indirectly, the nature conservation interest of national nature reserves or sites of special scientific interest.

6.29. Policy ENV7 seeks to prevent developments which may contravene the protection afforded to European protected species and that such development may only be permitted when in the public interest.

6.30. Policies ENV11 and ENV14 seek to ensure that proposals for development which may affect a Conservation Area or Listed Building should be of high quality design and should preserve or enhance that area or listing.

6.31. Policy ENV16 aims to restrict development proposals which would unacceptably adversely affect the character or appearance of historic parks and gardens, including ensuring that setting is also appropriately considered. The policy also seeks the protection of the special historic interest of historic landscapes included in Part 2 of the Register of Landscapes, Parks and Gardens of Special Historic Interest in Wales.

6.32. In relation to electricity power lines, Policy DC12 seeks to encourage buried electricity transmission wherever possible, whilst recognising that the council may not be the relevant decision-making authority in relation to such developments (UDP para 12.12.1). Policy DC12 states that:

6.33. "*all lines and pipelines should be placed underground unless there are overriding reasons for them not to be. Lines should be routed to minimise their impact on the landscape and natural and built environment of Powys, particularly in important landscapes and areas of conservation or archaeological interest, where overhead lines are unavoidable in rural areas, these should follow hedgerows, woodland margins, low lying land and folds in the landscape wherever feasible*".

6.34. A number of general development control policies are also provided within Part 2 of the UDP, including Policy DC6 which references that operational development by utility companies will be facilitated, having regard to their technical and economic constraints, provided there are no unacceptable adverse effects on landscapes; settlements, buildings or setting; and with no unacceptable effect on environmental, historic, archaeological and nature conservation sites.

6.35. An initial review of the UDP proposals maps indicates that land allocations have limited impact upon the routeing options; however, a more detailed review of land allocations and designations will be provided within the ES Planning Policy Context chapter.

Emerging Local Development Plan

6.36. Under the Planning & Compulsory Purchase Act 2004 (Ref. 6-7), Powys is required to prepare a Local Development Plan (LDP) for the County area (excluding the Brecon Beacons National Park) which, once adopted, will replace the Powys UDP. The LDP is currently at an early stage of production, with public consultation on a 'Deposit Plan' anticipated to take place during the summer of 2014.

6.37. PCC has recently concluded a consultation on a LDP Preferred Strategy document. The document outlines, in broad terms, how the County is strategically predicted to develop to 2026, including scenarios for housing, employment and retail growth across the county over the forthcoming LDP plan period.

6.38. As part of the LDP process, PCC requested the submission of candidate sites (invitation to submit sites ended in May 2011), for consideration for future allocation for development through the LDP process. These sites are currently being considered by PCC for inclusion in the future Deposit Draft LDP (anticipated for summer 2014). The Council issued a Sites Status Report in November 2012 which provides a progress update on PCC's consideration of submitted candidate sites, identifying those sites which are proceeding in candidate site assessment (Ref. 6-8).

6.39. Given its early stage in the LDP preparation process, much of the content of the emerging LDP is of only limited significance. However, the weight afforded to the emerging LDF will increase during its progress towards adoption. Documents prepared in support of the emerging LDP, including the Deposit Draft LDP, will be reviewed in the context of the Proposed Development.

Other Considerations

6.40. Whilst the Planning Act 2008 (and the related National Policy Statements), Welsh National Policy and the Local Development Plan (and the Unitary Development Plan until such time as the Local Development Plan is available) are key documents in the decision making process, other policy documents are considered to be of contextual relevance.. Additional policy documents to be considered will include the following:

- *Meeting the Energy Challenge - A White Paper on Energy, May 2007 (Ref. 6-9);*
- *The Climate Change Act 2008 (Ref. 6-10);*
- *The UK Low Carbon Transition Plan – National Strategy for Climate Change and Energy, (July 2009) (Ref. 6-11);*
- *One Wales – One Planet, 2009 (Ref. 6-12);*
- *The UK Renewable Energy Roadmap, 2011 (Ref. 6-13);*
- *All Islands Approach to Open up Renewables Opportunities, 2011 (Ref. 6-14);*
- *Energy Wales: A Low Carbon Transition, 2012 (Ref. 6-15);*
- *Wales Spatial Plan, 2008 (Ref. 6-4);*
- *Planning Policy Wales, Edition 6, February 2014 (Ref. 6-5); and*
- *Technical Advice Notes (TANs) to supplement the policy set out in PPW, in particular:*
  - *TAN 5: Nature Conservation and Planning, 2009;*
  - *TAN 8: Renewable Energy, 2005;*
  - *TAN 11: Noise, 1997;*
  - *TAN 12: Design, 2009;*
  - *TAN 13: Tourism, 1997;*
  - *TAN 15: Development and Flood Risk, 2004.*
  - *TAN 20: Planning and the Welsh Language, 2013, and*
  - *TAN 23: Economic Development, 2014.*

7.0 BIODIVERSITY AND ECOLOGY

Introduction

7.1. This Chapter of this EIA Scoping Report details the preliminary findings of the Strategic Ecological Report and the Strategic Ecological Report 2 (SER and SER2) (see Table 1.2 of this Scoping Report), produced in March 2012 and September 2013 respectively by Land Use Consultants (LUC), which appraised the ecological features of the Broad Route Corridors (BNC, BSC and CC). The Strategic Ecology Reports involved undertaking a strategic desk study in order to identify designated sites, habitats considered to be of 'highest ecological value' (i.e. peat land, woodland and aquatic habitats), protected (non-avian) species, ornithology and habitat management plans prepared as part of the mitigation measures of several of the connecting wind farm sites. The reports involved a site visit and utilisation of remote sensing data (aerial photography).

7.2. This Chapter details the scope of the Ecological Impact Assessment (EcIA), which includes the survey data from the ornithological surveys (breeding and wintering) undertaken by LUC in 2012, 2013 and 2014. Also included are the ecological surveys to be undertaken in 2014 as informed by the SER and SER2, together with the initial results of the Extended Phase 1 Habitat Survey currently being undertaken, which are continually updating the requirements for detailed Phase 2 surveys.

7.3. An Extended Phase 1 Habitat Survey and range of Phase 2 surveys are being and will be undertaken throughout 2014 and where relevant, the results of these surveys are referred to (so far as currently available) within this EIA Scoping Report. This information, together with feedback from consultees, has been used to identify key ecological features within the selected route corridors.

7.4. This Chapter also details the methodology to be followed during the EcIA that will be incorporated into the ES. Areas and information that have not been reviewed in this EIA Scoping Report will be assessed within the EcIA.

7.5. The purpose of the EcIA will be to: identify and describe existing ecological features within and around the proposed location of the works in a defined study area; and to assess the significance of the impacts of the Proposed Development on these ecological features in conjunction with agreed mitigation measures.

7.6. Recommendations for avoidance, reduction, offsetting, and enhancement measures will be proposed to minimise any potential adverse impacts of the Proposed Development on ecological features and the significance of any residual impacts will be assessed in the context of the mitigation that SP Manweb is confident that it can secure. Examples of potential mitigation measures are described in this Chapter, however, full mitigation proposals will be provided once the EcIA has been undertaken.

Guidance and Data Sources

7.7. The EcIA will follow the Guidelines for Preliminary Ecological Appraisal (Ref. 7-1) and the Guidelines for Baseline Ecological Assessment (Ref. 7-2).

7.8. A variety of data sources were and will be used to gain information about notable habitats and species which could be affected by the Proposed Development.

- *Multi-Agency Geographic Information for the Countryside (MAGIC) website (magic.defra.gov.uk);*
- *Local Wildlife Sites digitised from the publicly available online dataset;*
- *Montgomeryshire Wildlife Trust Sites provided by the Biodiversity Information Service for Powys and Brecon Beacons National Park (Ref. 7-3);*
- *Where available, environmental reports relating to the Contracted Wind Farms and other overhead line developments within the study area (all documents reviewed will be listed within the ES);*
- *Phase 1 Habitat Map of Wales (NRW);*
- *Ordnance Survey maps and aerial photographs; and*
- *Information gained from previous and ongoing consultation.*

7.9. The MAGIC website was consulted to determine whether any statutory designated sites are present within 2 km of the Preferred Line Route Alignments. This website includes information on: international designations (including Wetlands of International Importance (i.e. Ramsar sites)); European designations (including Special Areas of Conservation (SAC, cSAC), Special Protection Areas (SPA, pSPA)); and national designations (including Sites of Special Scientific Interest (SSSI) and ancient woodland).

Assessment Scope and Consultation

7.10. This section describes the consultation and desk study process/results together with the details of the survey methodologies to be employed for the Phase 1 and Phase 2 surveys. This has been informed by SER and SER2 and surveys completed to date.

Consultation

7.11. The following organisations were consulted as part of the SER and SER2;

- *Natural Resources Wales (NRW);*
- *Powys County Council (Biodiversity Officer);*
- *Royal Society for the Protection of Birds (RSPB);*
- *Montgomery Wildlife Trust;*
- *Montgomeryshire Mammal Group;*
- *British Trust for Ornithology;*
- *Radnorshire Bat Group;*
- *Radnorshire Wildlife Trust;*
- *Brecknock Bat Group*
- *Brecknock and Radnor Amphibian and Reptile Group;*
- *Dyfed-Powys Amphibian and Reptile Group;*
- *Brecknock Wildlife Trust; and*
- *Botanical Society of Britain and Ireland (BSBI) Montgomeryshire County Recorder.*

7.12. Of particular significance is consultation with NRW which was carried out during the preparation of SERs for the SP MWC Project. NRW has, via various meetings as well as in correspondence, highlighted a number of significant ornithological considerations in relation to the Preferred Line Route Alignments, which are summarised as follows (the Broad Route Corridors have since developed into the Preferred Line Route Alignments, following Stage Two and Three consultation);

- *CC Broad Route Corridors – consideration of the potential impacts to Llyn Mawr Site of Special Scientific Interest (SSSI) is required. The lake is used by wildfowl which may be affected by the Proposed Development;*
- *BNC Broad Route Corridors – consideration is required for potential impacts to black grouse (Tetrao tetrix), which are known to be sensitive to overhead lines. NRW is concerned that the route corridor might be placed within the vicinity of areas such as Llanbrynmair plateau and Nant yr Eira, which are known to support the species;*
- *BNC Broad Route Corridors - NRW makes reference to potential impacts to breeding curlew, hen harrier and peregrine, all of which are of high conservation value and sensitive to overhead lines;*
- *BNC Broad Route Corridors - NRW raises concerns regarding potential impacts to peat and sensitive peatland habitats, both in respect of overhead lines and undergrounding; and*
- *BNC and BSC Broad Route Corridors - NRW makes reference to Section 106 Agreement areas and Habitat Management Plans that have been proposed for nearby wind farms (e.g. Llanbrynmair and Tirgwynt) and that the Proposed Development may have a detrimental impact on the mitigation strategies for the wind farms.*

7.13. Correspondence from NRW dated the 30th January 2013 confirms that they are broadly happy with the methodology/ approach to winter bird surveys. The scope of these surveys was discussed with NRW in August 2012 prior to the surveys being undertaken. During these discussions NRW had the following comments:

- *The consideration of whooper swan and Llyn Mawr and other lakes in the area of SSA B appears to have been considered sufficiently within the report;*
- *The need to ensure sufficient time is taken to cover all the potential temporal variations in bird distribution and abundance - it is not always clear how much time was assigned to each survey and how they were actually undertaken;*
- *It is clear from reading the April 2013 report that full access to the land was not available;*
- *BNC Preferred Line Route Alignments extend northwards into an area within the Llanbrynmair wind farm which historically supported black grouse. Given the proposed location of the substations in this area we assume however the route corridor is in reality unlikely to extend into this area. It appears from reading the report that this location has been considered, however it refers to the recording of golden plover. Again the methodology deployed is unclear and not detailed due to limited access to the land; and*
- *It is clear from reading the wintering bird report dated April 2013 that sufficient access to the land was not available therefore true vantage points were not employed across the whole of the survey. These surveys need to be repeated with full access to the land so that the lie of the land can be adequately assessed and vantage points undertaken.*

7.14. Correspondence to NRW dated the 17th November 2013 confirms that, despite extensive survey efforts, results revealed no major aggregations of waterfowl along the Broad Route Corridors (as they were at that time) and that no route passes near Aberhafesp in the Severn valley where small numbers of whooper swan gather each winter.

7.15. Based on winter bird surveys carried out to date, it is considered that further winter vantage point (VP) surveys are necessary for the Proposed Development. The only exception to this is the Cerist floodplain where a limited number of VP surveys continued and were completed in March 2014.

7.16. In their correspondence of the 10th June 2013, NRW raised the following main concerns with regards to breeding bird survey methodology;

- *That only Schedule 1 raptors and curlew were included as the main focus of the study and that impacts cannot be mitigated if sufficient surveys are not undertaken to identify where avian species are present;*
- *There was to be no consideration of wildfowl, owls and other species. Species such as wildfowl are sensitive to overhead lines;*
- *Consideration of Carnedd Wen and Llanbrynmair windfarms;*
- *Full access to land was not available;*
- *VPs were to focus on 'raptor breeding in woodland' and queried why open habitats, which can be used by peregrine or merlin, were not proposed to be included;*
- *Peregrines were be surveyed at known roost sites, but queried how unknown roost sites would be considered;*
- *There was no scope to survey hen harrier;*
- *Requested that a map of the seven sites known to support breeding curlew should be provided. Consideration of other areas which may potentially support curlew would also need to be considered;*
- *Noted that Brown Shepherd Survey Methodology suggests that three survey visits should be undertaken between April and July;*
- *Requested full details of surveyors, experience and the weather conditions be provided; and*
- *Requested that avian surveys to support the Environmental Impact Assessment (EIA) should include at least two years survey data as well as refer to historical data.*

7.17. A response to the queries above was made to NRW on the 22nd July 2013, as follows:

- *Clarified that wildfowl surveys were scoped out due to the results of the winter surveys;*
- *Clarified that Broad Route Corridors (as they were at that time) are not proposed to be located within black grouse areas - this will be reviewed with NRW;*
- *Clarified that hen harrier surveys are not included as route corridors do not provide heather moorland habitats, which are preferred by this species;*
- *Proposed that further surveys in 2014 will extend to a wide range of species, which would be confirmed with NRW in advance;*
- *Proposed that wider investigation of open habitats will be undertaken for raptors, including consideration of peregrine and merlin;*
- *Proposed that further assessment of habitats for curlew will be undertaken; and*
- *Confirmed that surveys are being undertaken on the edge of the Trannon Moor within the BSC route corridor.*

7.18. The only other respondents to pre-EIA Scoping consultation requests were the Radnorshire Wildlife Trust. In their email response of December 2012, they highlighted the need to closely consider great crested newts along Broad Route Corridors CC1, L1 and L2[6].

Study Areas for the Ecological Impact Assessment

7.19. The study area for the SER and SER2 included the Broad Line Routes (including BSC, BNC and CC) together with the Contracted Wind Farms and other development proposals that were progressing through the planning system at that time.

7.20. Since the SER and the SER2 were undertaken, the route corridors have been refined and this EIA Scoping Report refers to the Preferred Line Route Alignments, defined in Chapter 2 and shown in Figures 1 and 2 (Appendix A).

7.21. To define the total extent of the Survey Areas for the EcIA, the proposed development activities were 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 both those which would occur by land-take and habitat loss, and those which may occur through disturbance such as noise. This varies according to the ecological receptor being assessed and, as such, there are number of EcIA Survey Areas.

7.22. For the majority of ecological receptors, the Survey Area is defined as the land within the Indicative DCO Site Boundary (as shown in Figures 1 and 2).

7.23. For certain protected species (water vole, otter, badger and crayfish) where there may be impacts outside of the Indicative DCO Site Boundary[7] (e.g. as a result of disturbance and potential impacts on water quality as a result of run-off) the Survey Area is defined as land within the Indicative DCO Site Boundary plus land within 50m of the Indicative DCO Site Boundary.

7.24. For some surveys (for great crested newt and birds), a survey area is required to ensure that the survey considers the relevant zone of influence and are in line with best practice/ recommended methodology and any consultation feedback undertaken so far. Where this applies, a specific alternative Survey Area will be surveyed and this is defined in the relevant part of the 'Assessment Methods' section below.

7.25. For convenience, the EcIA Survey Area and alternative survey areas are summarised in Table 7.1.

6 Broad Route Corridors L1 and L2 now form part of what is referred to as the CC Preferred Line Route in this EIA Scoping Report.
7 The Indicative DCO Site Boundary comprises the Preferred Line Route Alignments and the integral, indicative construction and mitigation areas and accesses that lie outside the Preferred Line Route Alignments.

7.1 | Summary of the Extent of the Survey Areas for the EcIA	
Ecological Survey	**Extent of the EcIA Study Areas**
Extended Phase 1 Habitat Survey Phase 2 vegetation survey Phase 2 tree surveys Phase 2 hedgerow survey Phase 2 dormouse survey Phase 2 reptiles survey Phase 2 bats activity survey and static detectors Phase 2 bat tree assessment Phase 2 surveys for other mammals Phase 2 red squirrel survey	Indicative DCO Site Boundary Where there are features of interest immediately adjacent to the Indicative DCO Site Boundary or features, such has hedgerows, continue beyond this area, these will also be assessed. The Phase 2 bat tree assessment will also take account of any trees that may require to be felled outside of the Indicative DCO Site Boundary.
Phase 2 water vole survey Phase 2 otter survey Phase 2 crayfish survey Phase 2 badger survey	Indicative DCO Site Boundary plus 50 m
Phase 2 great crested newt survey	Indicative DCO Site Boundary plus 300 m
Wintering birds survey (using vantage point surveys) (completed)	Indicative DCO Site Boundary plus 500 m*
Breeding birds 2013 surveys (completed) - Raptors	Indicative DCO Site Boundary plus 500 m
Breeding birds 2013 surveys (completed)- Curlew and other waders	Indicative DCO Site Boundary plus 500 m, within identified known breeding sites
Breeding birds 2014 surveys (being undertaken in 2014) - Raptors	Indicative DCO Site Boundary plus 500 m
Breeding birds 2014 surveys (being undertaken in 2014) - Curlew and other waders	Indicative DCO Site Boundary plus 800 m, within identified known breeding sites
Breeding birds 2014 surveys (being undertaken in 2014) - Other breeding birds	Indicative DCO Site Boundary plus 500 m

* Includes large water bodies and river crossings that extend just outside this

7.26. These survey areas are based on current UK guidance and best practice for each ecological receptor, as defined in the Assessment Methods sections below. The survey areas will be reviewed throughout the EcIA process and revised as appropriate.

7.27. The desk study Search Area is based on the Indicative DCO Site Boundary plus the following zones of influence:

- *30 km for Special Areas of Conservation (SACs) and candidate SACs (cSACs) where bats are one of the qualifying species;*
- *2 km for Natura 2000 sites (SACs, cSACs, Special Protection Areas (SPAs), potential SPAs (pSPAs) and Ramsar sites), nationally important statutory sites of nature conservation importance, such as SSSIs; and*
- *1 km for non-statutory sites of nature conservation importance and protected or notable species.*

7.28. Notable species are those which are legally protected, identified in a Red Data book (Ref. 7-4 – 7.9) nationally or locally rare or endangered, or are identified as a priority species in the UK Biodiversity Action Plan (BAP) (Ref. 7-10), Section 42 of the Natural Environment and Rural Communities (NERC) Act 2006 (Ref. 7-11) and the Powys BAP (Ref. 7-12).

7.29. To define the temporal scope for ecological assessment, the proposed activities were reviewed in order to establish when impacts could occur and over what duration. Impacts have been considered in the context of the predicted baseline conditions within the zone of influence during the lifetime of the Proposed Development (i.e. the assessment will take into account how the existing conditions might change between the surveys and the start of construction and/ or operation).

7.30. The predicted changes in the baseline will also consider Glastir Agri-environmental Scheme (AES) agreements and Habitat Management Plans for wind farms.

7.31. The construction phase is expected to start in 2016 at the earliest so potential changes in existing conditions up to then will be considered in the ES, where relevant.

Assessment Methods

7.32. The EcIA will be undertaken with reference to current best practice and in particular the Guidelines for Ecological Impact Assessment in the United Kingdom (Ref. 7-2) and BS42020:2013 Biodiversity – Code of Practice for Planning and Development (Ref. 7-13).

7.33. Surveys are being and will be carried out, as described below, and these will follow the best practice/ recommended methodology for each ecological feature. Ecological features and resources will be described and mapped (including BAP priority habitats and species as well as species and habitats of Principal Importance). Potential ecological impacts will be identified and a full ecological impact assessment and assessment of the significance of effects will be carried out (in line with the methodology described below). Mitigation measures will be discussed and opportunities for enhancement measures will be identified. It should be noted that the ornithological and terrestrial ecology will likely be assessed separately, but with due regard to each other, as part of the EcIA process.

Data Gathering

7.34. Establishment of baseline conditions has and will involve the collation of existing published data (e.g. consultation, review of existing online data sources including published ecological information from other relevant schemes such as wind farm applications) and an Extended Phase 1 Habitat Survey. Specialist surveys, including vegetation, great crested newts, water vole, otter, birds, bats, dormice, reptiles, badgers, red squirrel and white clawed crayfish, will be undertaken where appropriate. The proposed specialist surveys, described in the 'Field Study' section below, will provide detailed information in relation to ornithology, vegetation and a range of faunal species/ groups.

Desk Study

7.35. Data has already been collated as part of this scoping exercise, as described below in the 'Baseline Conditions' section. Further data gathering with specialist recorders and groups will also be carried out to inform the EcIA. The desk study will focus on the Indicative DCO Site Boundary, and will extend to the zone of influence defined for each of the ecologically sensitive features.

7.36. The following organisations have been and will continue to be consulted to provide data to further inform the EcIA;

- *NRW;*
- *PCC (Biodiversity Officer);*
- *RSPB;*
- *Powys and Brecon Beacons National Park (BBNP) Biodiversity Information Service (BIS);*
- *Montgomeryshire Wildlife Trust (MWT);*
- *Montgomeryshire Bat Group;*
- *British Trust for Ornithology;*
- *Radnorshire Bat Group;*
- *Radnorshire Wildlife Trust;*
- *Powys/ Radnorshire Badger Group (PBG);*
- *Brecknock & Radnor Amphibian and Reptile Group;*
- *Dyfed-Powys Amphibian and Reptile Group; and*
- *BSBI Montgomeryshire and Radnorshire County Recorders.*

7.37. Ordnance Survey maps, on line mapping resources and aerial photographs are being used to identify water bodies within the survey areas.

Field Study

Extended Phase 1 Habitat Survey

7.38. The survey has and will follow the 'Extended Phase 1' methodology as set out in the Phase 1 Survey Handbook (Ref. 7-14), and the Guidelines for Baseline Ecological Assessment (Ref. 7-2). This method of survey provides information on habitats within the Indicative DCO Site Boundary (Table 7.1) to assess the potential for notable or protected fauna to occur in or adjacent to the Proposed Development. Habitats/ features of importance or significant ecological value will be individually target noted and identified for further survey as required.

7.39. The majority of the Extended Phase 1 Habitat Survey has been undertaken outside of the optimal time of year for such a survey, which is April to October; however it is considered that a thorough assessment of the habitats present and their potential to support legally protected species will nonetheless be achievable. As the Preferred Line Route Alignment will be revisited throughout the survey season, any areas supporting potentially botanically rich flora will be subject to further update surveys during the optimal time of year (April to October) in 2014. It will be ensured that the conditions are suitable and that the whole of the study area is accessible. As a result, a comprehensive and valid assessment of the habitats present and their potential to support legally protected species will be undertaken.

7.40. The Extended Phase 1 Habitat Survey has and will involve preliminary investigations in respect of the presence of legally protected species within the Indicative DCO Site Boundary (Table 7.1). This has included and will include:

- *Recording evidence of the presence of invasive weeds listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (Ref. 7-15), including Japanese knotweed and giant hogweed;*
- *Assessment of habitat potential for reptiles and amphibians, in particular great crested newts;*
- *Searching for signs of otters and water voles, such as spraints, latrines, footprints and runs;*
- *Assessment of suitable habitats for nesting birds;*

- *Evaluation of habitats for their potential to support other protected species or groups, including terrestrial/ aquatic invertebrates;*
- *Assessment of any watercourses for their suitability to support white-clawed crayfish and fish such as salmonids (brown trout) and river lamprey;*
- *Assessment of suitable habitats for dormice/ evaluation of habitat suitability for dormice;*
- *Searching for signs of badger activity including setts, tracks, snuffle holes and latrines; and*
- *A visual inspection of trees and buildings to assess their suitability for bat roosts.*

Phase 2 Vegetation Survey – National Vegetation Classification

7.41. Habitats of value are likely to be present within the Indicative DCO Site Boundary. Where these habitats have been or are identified within this area during the Extended Phase 1 Habitat Survey, a Phase 2 vegetation survey and description according to the National Vegetation Classification (NVC) will be carried out.

7.42. Where a Phase 2 vegetation survey is carried out, the survey method will follow the NVC Users' Handbook (Ref. 7-16). Records of rare or notable plant species have been and will continue to be made whilst undertaking Phase 1 and Phase 2 surveys in relation to the Indicative DCO Site Boundary. All Phase 2 vegetation surveys will be implemented at an appropriate time of year to allow identification of all plant communities present (May to September).

7.43. Valuable habitats can include semi-natural habitats, those habitats which are considered to be vulnerable, species rich, rare and/ or habitats that are representative of BAP/ S41 habitats. Where peat land habitat is identified, peat depths and locations will be recorded using a peat probe and hand held GPS unit.

Phase 2 Tree Survey

7.44. Mature, veteran and ancient trees within or in close proximity to the Indicative DCO Site Boundary and could potentially be impacted upon (Table 7.1) have and will be identified using online aerial photographs, desk top study and findings from the Extended Phase 1 Habitat Survey. During the Extended Phase 1 Habitat Survey all mature, veteran and ancient trees have been and will be assessed and individually target noted and locations recorded using hand held GPS.

7.45. These trees will then be subject to further survey depending on their age and location within / close to the Indicative DCO Site Boundary, following the methodology described in Lonsdale (Ref. 7-17). A pro forma will be completed for all veteran and ancient trees, indicating their location, size, condition and any other key features they may possess. Surveys will be completed throughout the year.

7.46. Specialist arboricultural survey will also be undertaken in relation to engineering requirements. Reference will also be made to this information in respect of assessing the ecological value of trees which may be affected.

Phase 2 Hedgerow Survey

7.47. Hedgerows within the Indicative DCO Site Boundary (Table 7.1) have and will be surveyed following Hedgerow Evaluation and Grading Systems (HEGS), methodology as per Clements & Toft (Ref. 7-18). This method requires surveying of the entire length of each hedgerow within Indicative DCO Site Boundary and which may extend beyond this Area where necessary to assess the hedgerow in its entirety. Key features will be recorded such as; notable flora and fauna, height, length, width, average cross-section percentage gaps, purpose, number of connections, number of standard trees within the hedgerow and presence of features including; hedge bank, ditch and grass verges.

7.48. The majority of the HEGS surveys may be undertaken outside of the optimum time of year for such a survey, which is April to October. However it is considered that a detailed assessment of the hedgerows following the appropriate methodology will be able to be made. If it is considered necessary, update surveys for highlighted hedgerows will be undertaken during the optimum survey period (April to October). It will be ensured that the conditions are suitable and the whole of the site is accessible. As a result, a comprehensive and valid assessment of hedgerows present and their importance will be documented.

Phase 2 Great Crested Newt Survey

7.49. Suitable ponds and ditches for great crested newt within the great crested newt survey area (Table 7.1) have been identified using online aerial photographs, desk top study, OS maps and findings from the Extended Phase 1 Habitat Survey. Ponds or features considered unsuitable (e.g. those in acidic conditions in peat, or ditches with a strong flow of water) and excluded from the survey will be described within the Biodiversity and Ecology ES chapter.

7.50. There will be limited permanent habitat loss (wood pole structure/ tower locations) and temporary habitat losses (for example those related to the construction areas and accesses). The application of a 300 m buffer around the Indicative DCO Site Boundary is considered to be sufficient due to the localised nature of the potential impacts. For similar overhead line schemes, a 250 m buffer is usually sufficient; however, in this case the slightly wider buffer of 300 m is recommended to allow for any minor changes to the Preferred Line Alignment within the Preferred Line Route Alignment that might result from the Applicant's ongoing consultation process.

7.51. An initial habitat suitability assessment of ponds has been undertaken to produce a habitat suitability index (HSI) in accordance with Oldham et al. (Ref. 7-19). Identified suitable ponds/ ditches will be surveyed for great crested newt presence/ absence. Ponds which are isolated from the Proposed Development by barriers to newt movement/ dispersal (e.g. major roads, railway lines, fast-flowing watercourses) have been excluded from further surveys, as it is considered reasonably unlikely that newts from such ponds will utilise habitats within the Indicative DCO Site Boundary. Ponds which are considered to be unsuitable for newts have also been excluded from further survey.

7.52. Where suitable ponds and ditches have been identified, presence/ absence surveys are being carried out to determine if great crested newts are present. These surveys are being undertaken in accordance with the methodologies described in the Great Crested Newt Mitigation Guidelines (Ref. 6-20). Further population size class assessments, in accordance with the guidance, will be carried out where great crested newts have been found.

7.53. Great crested newt surveys commenced mid-March 2014 with a minimum of two of the four presence/ absence surveys between mid-April and mid-May, in line with the recommendations of the Great Crested Newt Mitigation Guidelines (Ref. 6-20). The great crested newt surveys have been and will continue to be undertaken during suitable weather conditions, following best practice guidance.

7.54. Field survey methods will include: bottle trapping, egg searches, torch searches, netting and refugia searches.

Phase 2 Water Vole Survey

7.55. Suitable watercourses (i.e. those that provide potential water vole habitat) within the Indicative DCO Site Boundary plus 50m (Table 7.1) have been and continue to be identified using online aerial photographs, OS maps, desk top study and findings from the Extended Phase 1 Habitat Survey. Where suitable water vole habitat is identified and is likely to be impacted, a full habitat assessment for water vole will be undertaken. The surveys of these watercourses will be carried out at the appropriate time of year (between April and October) and following guidelines set out in the Water Vole Conservation Handbook, third edition (Ref. 7-21).

7.56. Following assessment of the habitat, the watercourses will be searched for potential signs of water voles according to guidelines set out in the Water Vole Conservation Handbook, third edition, (Ref. 7-21). These field signs include: faeces, latrines, feeding stations, burrows, nests, runways in vegetation and footprints.

Phase 2 Otter Survey

7.57. Suitable watercourses (i.e. those that provide potential otter habitat) within the Indicative DCO Site Boundary plus 50 m (Table 7.1) have been and continue to be identified using online aerial photographs, highlighted on OS maps and findings from the Extended Phase 1 Habitat Survey. The ecological desk study undertaken to date indicates that otters are likely to be present throughout the otter study area. Where suitable otter habitat is identified and is likely to be impacted by the Proposed Development, a full otter survey will be undertaken.

7.58. Otter surveys will involve searches for field signs including the following: spraints, sign heaps (e.g. twisted grass, silt heaps with spraints), footprints, otter holt/ resting sites and feeding remains. Surveys will be carried out throughout the year; any evidence indicating presence of otters will be detailed and GPS recording noted. The surveys will follow a modified methodology as described in Lenton, et al (1980) (Ref. 7-22).

Wader Survey

7.59. Suitable habitat for wading birds within the EcIA Survey Area (Table 7.1) will be identified using online aerial photographs, OS maps, desk top study and findings from extended Phase 1 Habitat Survey. Surveys for waders in the Cefn Coch area commenced in 2011 with breeding territories for curlew and lapwing were recorded; repeat surveys have been and will continue to be conducted in 2013 and 2014.

7.60. Surveys are undertaken in accordance with BTO survey methodologies, in particular the Brown and Shepherd (Ref. 7-23) method for censusing upland breeding wader populations and 'Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms' (Ref. 7-24), taking into account primarily; Golden Plover, Dunlin, Oystercatcher, Lapwing, Curlew, Snipe and Redshank. Based on recommendations by Pearce-Higgins et al. (2009) (Ref. 7-25), an 800 m survey buffer from the Indicative DCO Site Boundary will be applied.

7.61. There will be a minimum of four visits per season, per year, commencing in March 2014 and concluding in August 2014 between the hours of 8:30 and 18:00. Where curlew nesting sites are identified, surveys will continue throughout the summer until August, this will allow for the identification of summer foraging sites.

Wintering Birds Surveys (undertaken in 2012 and 2013)

7.62. Wintering birds surveys using vantage point (VP) surveys have been completed in 2012-2013 over two survey seasons by LUC. The surveys have been undertaken during SP Manweb's process of route optioneering and they therefore considered various iterations of the connections routes (including the Preferred Line Route Alignments).

7.63. The VP surveys followed the 'Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms' (Ref. 7-24) and a modified survey methodology as described below:

- *An initial assessment was made to ascertain the key sites to be surveyed at river crossings or near open water. Initial assessments involved car based surveys along major and minor roads within the Preferred Line Route Alignments. These were supplemented by walkovers of areas where public access to land was available.*
- *The initial assessments undertaken in early October 2012 provided a high level indication of likely avian ecological constraints along each of the corridor routes chosen. This methodology offered a broad brush approach, using surveyors' extensive ornithological knowledge of the Montgomeryshire area to enable judgements to be made about habitat suitability for wintering bird species.*
- *Detailed recording surveys began at the end of October 2012 and continued until mid-March 2014. Key sites for survey are provided in Table 7.2.*

7.2 | Key Sites for Wintering Birds Survey		
Site Name	**Grid Reference**	**Associated Corridor / Target Species**
Banwy crossing 1	SH990109	BNC1
Banwy crossing 2	SJ012105	BNC1
Banwy crossing 3	SJ020105	BNC1
Carno crossing	SN957975	BSC
Llyn Mawr/Du/Tarw	SO012968	CC1
Aberhafesp layby	SO058931	Whooper Swan
Aberhafesp Church	SO073923	Whooper Swan
Caersws	SO037924	Whooper Swan
Cerist crossing	SN981905	CC1
Trefeglwys footpath	SN980905	CC1
Severn crossing	SN987852	CC1
Severn crossing	SN997852	CC1

7.64. Upland areas chosen to monitor golden plover were as follows:

- *The north end of Preferred Line Route Alignment CC1, around Llyn Mawr; and*
- *The south end of Preferred Line Route Alignment BSC, around Cefn Coch Marshalling Station.*

7.65. Depending on weather conditions and bird activity, up to two hours was spent at each of the key sites or at known feeding grounds. In respect of the latter, specific interest was taken in the wintering flock of whooper swans that use the Severn valley near Aberhafesp between Caersws and Newtown.

Breeding Birds Surveys (undertaken in 2013)

7.66. Breeding bird surveys were carried out to inform strategic level ecological appraisal for the Proposed Development. Survey methods utilised to date are described in this section.

7.67. Spring 2013 was very cold with poor weather. Some birds may not have bred during that year. The information already gathered will be supplemented by additional surveys of the Preferred Line Route Alignments during 2014 to inform the EIA (described below).

Raptors

7.68. Raptor surveys were undertaken within the raptor survey area (Table 7.1) using methods based on Hardey et al (Ref. 7-26). Surveys were conducted from public roads and focussed on woodland and forests (which are considered to be suitable nesting habitat).

7.69. The aim of the survey was to identify the possible number of breeding raptors along the Preferred Line Route Alignment and to identify breeding habitat that will need to be re-surveyed to locate actual nests immediately prior to any construction. Breeding territories were identified by watching for pairs of displaying birds, along with any areas of high raptor activity.

7.70. Individual nests were not necessarily located at this stage. Second visits as described in Table 7.3 were not possible due to access constraints, however likely nest locations were visited during Visit 1. As the aim was to locate nesting pairs and not to record productivity, later visits to nests to check for the number of young were not undertaken.

7.71. In addition, peregrines were surveyed by visiting all known sites, past and present. These were identified by the Welsh Kite Trust, which has been undertaking detailed peregrine surveys in mid Wales over the last two seasons. No new potential peregrine sites – cliff areas – were identified within the raptor study area. In total, nearly 100 km2 of suitable habitat was surveyed.

7.72. Table 7.3 below provides a summary of the survey effort for raptors.

7.3 | Summary of 2013 Raptor Survey Effort

Visit Number	Red kite	Goshawk	Merlin	Hobby
1	March to early April to check for occupancy using VPs	March to April to check for occupancy using VPs	March to April to check for occupancy using walkover	April – May Check for occupancy sunrise to mid-morning
2	Late April – Mid May – find nests by wood visits	Late April – Mid May – find nests by wood visits	May – June Locate nests – survey and pluckings	Locate nests (but not visit) using group observers at VPs

Curlew

7.73. Seven 'sites' were identified where curlew are known to breed in the vicinity of the Preferred Line Route Alignments. Information on the sites was gained from the results of curlew research work undertaken by Ecology Matters for wind farm developers, and a full survey of the Montgomeryshire uplands that was undertaken for the Countryside Council for Wales (CCW) in 2012.

7.74. The survey involved three visits to each site with a walkover survey to record breeding behaviour during April and May 2013. The sites were as follows:

- *Llandinam P&L / Llaithddu;*
- *Rhyd Ddu / Twmpath Melyn;*
- *Mynydd y Hendre;*
- *Llanbrynmair;*
- *Carno;*
- *Mynydd Garthpwt; and*
- *Dyfnant.*

7.75. All areas of suitable habitat within these sites and within the 2012/ 2013 curlew survey area (Table 7.1) were surveyed using the extended 'Brown and Shepherd' method (Ref. 7-23). A buffer of 500 m was applied from the corridor following usual practice on developments such as windfarm sites.

7.76. Where birds were seen adjacent to the curlew study area these were also noted for completeness.

Breeding Bird Surveys (to be undertaken)

7.77. Schedule 1 raptors and curlew have been identified as the key sensitivities and survey will focus on these species. Sample breeding bird surveys will also be undertaken. This scope is based on previous surveys, discussions with NRW and email from NRW dated 12th March 2014.

Raptors

7.78. Further raptor surveys are being undertaken within the raptor survey area (Table 7.1) using methods outlined in Hardey et al (Ref. 6-26). The intention is to cover the Preferred Line Route Alignments with a series of VPs, focussing on likely raptor breeding woods. Breeding territories will be identified, along with

any areas of high raptor activity. Individual nests will be located in 2014 where possible. A 500 metre buffer from the Indicative DCO Site Boundary has been applied to nest finding. This is considered the standard distance to avoid disturbance of schedule 1 raptors (Ruddock and Whitfield, 2007) (Ref. 7-27)

7.79. The aim of the survey is to identify the possible number of breeding raptors within the raptor study area and to identify breeding habitat that will need to be re-surveyed to locate actual nests immediately prior to any construction works associated with the Proposed Development.

7.80. In addition, peregrines are being surveyed by visiting all known sites, past and present.

7.81. Barn Owl data will be purchased from Montgomery Barn Owl Group (pending discussions).

Curlew

7.82. Curlew is being surveyed using the extended 'Brown and Shepherd' method (Ref. 7-23). This will involve five visits to each site with a walkover survey to record breeding behaviour during April and May 2014 and further visits until August to identify foraging areas, as requested by NRW. Seven 'sites' have been identified where curlew are known to breed within curlew study area. These sites are as follows:

- *Llandinam P&L / Llaithddu.*
- *Rhyd Ddu / Twmpath Melyn;*
- *Mynydd y Hendre;*
- *Llanbrynmair;*
- *Carno;*
- *Garthpwt; and*
- *Dyfnant.*

7.83. All areas of suitable habitat within these sites and within the 2014 curlew survey area (Table 7.1) are being surveyed using the extended 'Brown and Shepherd' method (Ref. 7-23). Following discussions with NRW, the survey buffer area has been extended to 800 metres from the Indicative DCO Survey Boundary.

7.84. This curlew study area may be extended where it is considered that pairs may be foraging across the corridors as curlew can cover quite large areas in the breeding season.

Other Breeding Birds

7.85. Sample 'breeding bird survey' visits are being made to a representative variety of habitats to include hedges, woods (coniferous and deciduous), farmland and moorland. Two early morning visits are being made to each site; the first between April and mid- May and the second between mid-May and June. All birds are being recorded using standard British Trust for Ornithology (BTO) techniques as described in Gilbert et al. (1998) (Ref. 6-28). The method involves walking select transects along specific sections (representative samples of different habitats) of the 2014 other breeding birds survey area (Table 6.1), with a total of three visits between March 2014 and July 2014.

7.86. Surveys are being carried out between 06:00 and 10:00, avoiding the first hour before sunrise. No census will be undertaken in adverse weather conditions (heavy rain, poor visibility or strong winds). Listening points will be identified and used at key features along each transect, such as; hedgerows, woodland, areas of scrub and any other feature that may provide suitable habitat for breeding birds. All birds identified during the census are being mapped with their activity noted.

Phase 2 Crayfish Survey

7.87. Suitable watercourses (i.e. those that provide potential crayfish habitat) within the Indicative DCO Site Boundary plus 50 m (Table 6.1) have been and will be identified using online aerial photographs, OS maps and findings from the Extended Phase 1 Habitat Survey.

7.88. Where suitable white clawed crayfish habitat is identified and is likely to be impacted by the Proposed Development, a full survey for white clawed crayfish will be undertaken. It is noted that the optimal time for completing such a survey is after the breeding season (mid-July to mid-September). Surveys will follow methods as described by Peay (2003) (Ref. 6-29) and will avoid late May and June when females are carrying newly hatched young. Hand searches for crayfish will be completed by selecting ten suitable refuges within five optimal patches of habitat within a 100 m section of each watercourse surveyed.

Phase 2 Dormice Survey

7.89. Suitable habitat for dormice within and adjacent to the Indicative DCO Site Boundary (Table 7.1) has been identified using online aerial photographs, OS maps and findings from the Extended Phase 1 Habitat Survey. Where habitat has been found to be suitable to support a population of dormice, further Phase 2 habitat assessment has commenced and involves a proforma based assessment which includes the following attributes:

- *Habitat Feature:*
  - *Woodland;*
  - *Woodland understorey layer;*
  - *Scrub; and*
  - *Hedgerows.*
- *Size of wood/scrub (ha) and thickness of hedgerow/s (m);*
- *Availability of key food sources;*
- *Connectivity to wider landscape via suitable habitats;*
- *Signs of dormouse presence (e.g. opened nuts and nests); and*
- *For habitats listed above assessment to include:*
  - *data relating to notable species e.g. hazel, oak, honeysuckle, bramble, sycamore, ash, wayfaring tree, yew, hornbeam, broom, sallow, birch, sweet chestnut, blackthorn, hawthorn, conifers, cherry, crab apple, holly, ivy, other fruits;*
  - *age range of trees present;*
  - *percentage cover for standard trees and understorey layer/scrub. Indicate the level of diversity of trees/shrubs; and*
  - *for any other features level of suitability: excellent/ good/ moderate/ poor.*

7.90. Findings of the habitat proforma assessment have informed the suitability of the habitat and consequently, locations for the placement of nest boxes and nest tubes within the dormouse study area. There will also be concurrent nut searches following methods described in Natural England's (2006) Dormouse Conservation Handbook (Ref. 7-30) to inform presence/ absence of dormice.

7.91. Research suggests that nut searches, when used in isolation, are not sufficient to confirm absence of dormouse. Therefore, three survey methods will be used; nut searches, nest tubes and nest boxes. However, as guidance and research suggests, it is difficult to prove absence of the species due to their elusive behaviour, low population densities and varied omnivorous diet, particularly where suitable habitat provides abundant nesting opportunities. Where there is optimum habitat, within the dormouse study area, but dormice are not confirmed to be present, appropriate working procedures will be implemented to account for their potential presence (Ref. 7-31).

7.92. Nest tubes and boxes have been placed at appropriate locations within the dormouse study area. All surveys are being undertaken within a variety of habitats including; hedgerow, woodland, dense and scattered scrub. Particular focus is being paid to locations and activities that may lead to the loss and severance of habitats (e.g. construction access locations and overhead line-spanning woodland). Survey methods will follow those described in Natural England's (2006) 'Dormouse Conservation Handbook' (Ref. 7-30). Nest tubes and boxes are being checked monthly from April until November.

7.93. Current research suggests that in certain circumstances (e.g. conifer plantation lacking a shrubby understorey), nest boxes placed between 1-2 m on the trunks of trees are less likely to be inhabited by dormice as they are below the leafy zone of the tree (Ref. 7-31). Therefore in certain locations nest boxes have been placed at differing heights along the trunk to assess the use of nest boxes at different heights.

Phase 2 Reptiles Survey

7.94. Suitable reptile habitat within the Indicative DCO Site Boundary (Table 7.1) is being identified using online aerial photographs, OS maps and findings from the Extended Phase 1 Habitat Survey. Methods will follow those set out in Froglife (1999) (Ref. 7-32) and Gent, A.H. & Gibson, S.D. (Eds.) (2003) (Ref. 7-33).

7.95. Records indicate that common lizards are present within the reptiles study area. Surveys for reptiles will focus upon suitable habitats that are likely to be impacted by the Proposed Development. This will include known sites arising from the desk top study as well as other potentially suitable habitats such as the degraded peatland habitats to the north of Llangadfan, south-west and south of Dolwen, Cefn Coch, Rhyd, Llysyn, west of Llaithddu and south facing areas with bracken, scrub, woodland (with glades) and coarse grassland. A combination of tins and felt will be deployed, together with a visual encounter survey along a set transect encompassing suitable areas of habitat. Surveys will be undertaken during the appropriate survey season, which is between March and October.

Phase 2 Badger Survey

7.96. Suitable habitat for badgers within the Indicative DCO Site Boundary and 50 m buffer area (Table 7.1) has and will be identified using online aerial photographs, OS maps and findings from the Extended Phase 1 Habitat Survey.

7.97. During the Extended Phase 1 Habitat Survey; signs of badger (including locations (using GPS) of setts, latrines, hairs, paths and feeding grounds) were target noted. The desk top study and findings from the Extended Phase 1 Habitat Survey confirms that badgers are common throughout the badger study area.

7.98. The status and activity of any recorded sett has and will be determined in accordance with the standard published description and criteria (Ref. 7-34). Surveys are being conducted throughout the year, however, it is noted that the optimal period to carry out badger surveys is in early spring, autumn and winter.

Phase 2 Bats Survey

Activity Surveys

7.99. Bat activity surveys commenced May 2014 and will continue until September 2014. The surveys will follow the Bat Conservation Trust 'Good Practice Guidelines' (2nd Edition (Ref. 7-35), and be adapted with the development of the surveys.

7.100. Representative samples of habitat within the Indicative DCO Site Boundary (Table 7.1) are being surveyed using walked transects in line with the guidelines. Surveys consist of up to three surveys per transect over the season (spring/ summer/ autumn). The starting location of the transects will alternate each month, allowing for species that emerge from roosting sites later in the night to be recorded.

Static Detectors

7.101. In addition to standard field surveys, the assessment of impacts to bats involves the deployment of static detectors in accordance with the guidelines. Static detectors (such as SM2, Anabat and Anabat Express) with omnidirectional[8] microphones are being placed on representative linear features (hedgerows, scrub, woodland, wooded/ tree lined watercourses) throughout the bat activity study area that are likely to be affected during the construction of the Proposed Development.

7.102. Up to three static detectors per transect line will be placed on linear features for five to seven days per month, each month from May 2014 until November 2014. The bat activity surveys will influence the positioning of the detectors and, as the survey season advances, the static detectors will be placed in/ relocated to areas of higher bat activity.

Bat Tree Assessment

7.103. Trees within / in close proximity to the Indicative DCO Site Boundary (Table 7.1) were surveyed during the Extended Phase 1 Habitat Survey and were identified as having low, medium or high bat roost potential.

7.104. Further detailed tree assessments are being conducted on all trees that were identified as having medium and high bat roost potential. These surveys have and will take place in winter/ spring when bat features are identifiable due to the lack of foliage on trees. Features of trees and signs indicating possible use by roosting bats have and will be identified using the methods for visual inspection of trees as described in the Bat Conservation Trust's 'Good Practice Guidelines' (2nd Edition) (Ref. 7-35). Features and signs have and will be recorded on a pro-forma and mapped using GPS.

7.105. Where a tree within/in close proximity to the Indicative DCO Site Boundary (Table 7.1) contains a confirmed bat roost it will be selected as a listening point during the bat activity transects (described above).

8 Note where Anabat are used direction of microphone will be provided in the survey report.

Phase 2 Red Squirrel Survey

7.106. Suitable red squirrel habitat within the red squirrel survey area (Table 7.1) will be identified using online aerial photographs, OS maps, desk study findings and findings from the Extended Phase 1 Habitat Survey. Survey methods will follow those described in 'Practical Techniques for Surveying and Monitoring Red Squirrels' by the Forestry Commission (Ref. 7-36).

7.107. Line transect visual surveys for red squirrel will be undertaken within identified suitable habitat such as coniferous and broadleaved woodland that is anticipated to be affected by the Proposed Development. Particular attention will be paid to areas where there will be woodland loss. Surveys will be undertaken during the period between March 2014 and October 2014, with the optimum period being March-September. Surveys will be completed twice within that time period, once in spring and once in autumn.

Phase 2 Surveys for Other Mammals

7.108. The Preferred Line Route Alignments pass through a range of habitats for other mammals including UK BAP species. Mammals which may be present within the Indicative DCO Site Boundary (Table 7.1) that may require consideration within the EcIA include: brown hare, pole cat, pine marten, water shrew and hedgehog.

7.109. The desk study has identified records other mammals and found records of pine marten and pole cat within the mammals study area.

7.110. Consideration will be given to these species (and others of note) that may be encountered. The assessment of these species will be based upon desk top study. Where these species are observed during the Extended Phase 1 Habitat Survey they will be target noted and their location recorded.

Phase 2 Terrestrial Invertebrates Survey

7.111. The Preferred Line Route Alignments encompass a wide range of habitats that support a high diversity of invertebrates including notable species. The Proposed Development is unlikely to cause any significant long term impacts on terrestrial invertebrates and their habitats. Overhead lines are unlikely to impact upon terrestrial invertebrates and their habitats, therefore, at this stage it is envisaged that specialist invertebrate surveys will not be required. However, if it becomes apparent from desk study, consultation and the Extended Phase 1 Habitat Survey that potentially significant invertebrate species and their habitats might be subject to negative impacts, then specialist surveys will be undertaken.

Phase 2 Aquatic Invertebrates Survey

7.112. The Preferred Line Route Alignments contain a number of aquatic habitats including, streams, drains and wet ditches, which may have the potential for notable aquatic invertebrate species. Overhead lines are unlikely to impact upon aquatic invertebrate habitat. With the exception of white clawed crayfish, as highlighted above, it is envisaged that specialist aquatic invertebrate surveys will not be required.

Fish Survey

7.113. At this stage it is not envisaged that specific fish surveys will be required as the detail of open cut watercourse crossings have not been identified. If watercourse crossings are required and habitat is affected, NRW will be consulted regarding the availability of data for migrating salmonid habitat. If such data is not available and potential salmonid habitat (spawning and/or migration habitat) is likely to be affected, then fish surveys will be undertaken according to standard methodology. The methodology for fish surveys will be agreed with NRW should they be required.

Assessment of Significance

7.114. Impacts on nature conservation features will be characterised based on predicted changes as a result of the Proposed Development. In order to characterise the impacts on each feature, the following parameters will be taken account of:

- *The magnitude of the impact;*
- *The spatial extent over which the impact would occur;*
- *The temporal duration of the impact;*
- *Whether the impact is reversible and over what timeframe; and*
- *The timing and frequency of the impact.*

7.115. The assessment will identify those positive and negative impacts which would be 'significant', based on the integrity and the conservation status of the ecological feature. Impacts are unlikely to be significant where features of local value or sensitivity are subject to small scale or short-term impacts. However, where there are a number of small-scale impacts that in isolation are not significant, they may be significant in combination.

7.116. Having characterised impacts, professional judgement will be applied to assess their significance in line with the EIA Regulations (Ref. 1-6). Significance is determined by changes in the integrity or conservation status of nature conservation features. The integrity of 'defined' sites is described by CIEEM (2006) (Ref. 7-37) as follows:

"The integrity of a site is the coherence of the ecological structure and function across its whole area that enables it to sustain the habitat, complex of habitats and/ or the levels of populations of the species for which it was classified".

7.117. This definition will be used in the EcIA to determine whether the potential impacts of the Proposed Development on designated sites are likely to be significant:

7.118. The conservation status of habitats and species within a defined geographical area is described by CIEEM (2006) (Ref. 7-37) as follows:

- *"for habitats, conservation status is determined by the sum of influences acting on the habitat and its typical species, that may affect its long term distribution, structure and functions as well as the long term survival of its typical species within a given geographical area; and*
- *for species, conservation status is determined by the sum of influences acting on the species concerned that may affect the long term distribution and abundance of its population within a given geographical area."*

7.119. This definition will be used in the EcIA to determine whether the impacts of the Proposed Development on non-designated habitats and species are likely to be significant.

7.120. In addition to assessing the significance of potential effects, the confidence in the prediction is also considered; using an appropriate scale and any limitation to certainty is described. The scale is as follows:

- *Certain/ near certain (probability estimated at 95% chance or higher);*
- *Probable (probability estimated at between 50% and 95%);*
- *Unlikely (probability estimated at between 5% and 49%); and*
- *Extremely unlikely (probability estimated at less than 5%).*

7.121. In addition to assessing the significance of potential effects on any ecological features, the EcIA will also identify any legal requirements for mitigation measures and discuss any policy implications. This refers to policies including those set out in the NPSs, PPW and Local Development Plans and/ or Local Development Frameworks (refer to Chapter 6 of this EIA Scoping Report).

7.122. As part of the process of assessment of ecological impacts, a separate report to inform a Habitat Regulations Assessment (HRA) may be prepared as required by the Habitats Directive (Ref. 7-38). If required, it would be prepared in consultation with NRW. The HRA report would assess potential impacts of the Proposed Development on the relevant Natura 2000 sites. The need for an Appropriate Assessment will be determined in consultation with NRW during the EIA process. SP Manweb will comply with the requirements of PINS' Advice Note 10 (Version 5) on the Habitats Regulations (Ref. 7-39).

Assessment of Cumulative Effects

7.123. The EIA will also consider the cumulative (in combination) effects of the Proposed Development on ecological receptors. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

Baseline Conditions

7.124. Detailed ecological surveys and assessments commenced in February 2014 (with the wintering bird surveys commencing in 2012). The following description of the baseline conditions is based upon a review of SER and SER2, and a review of the data sources in relation to the Preferred Line Route Alignments, as well as the Extended Phase 1 Habitat Survey, which has commenced.

7.125. A review of the existing data revealed that there are a small number of statutory and non-statutory designated sites within 2 km of the Indicative DCO Site Boundary. Internationally and nationally designated sites are described below and the locations of the sites discussed in this section are shown on the Constraints Plan (Figure 4B, Appendix A).

Designated Sites

7.126. There are no sites within the Indicative DCO Site Boundary that are of international importance.

7.127. There is one site within the Indicative DCO Site Boundary that is of national importance:

- *The Gweunydd Camnant Site of Special Scientific Interest (SSSI) is located in the south eastern reach of the CC Preferred Line Route Alignment. It is of special interest because it supports a large population of the greater butterfly-orchid. Other locally uncommon plant species recorded include adder's-tongue and smooth brome. The fields are bordered by species-rich hedgerows and deciduous and coniferous woodland. This SSSI is designated for habitat mosaics including herb-rich neutral grassland, marshy grassland and mires.*

7.128. There are three designated sites within a 2 km radius of the Indicative DCO Site Boundary that are of international importance:

- *River Wye Special Area of Conservation (SAC) is located in the south eastern reach of the CC Preferred Line Route Alignment. River Wye (Upper Wye)/ Afon Gwy (Gwy Uchaf) - Together, the River Wye (Lower Wye) and the River Wye (Upper Wye) SSSIs and several of their tributaries represent a large, linear ecosystem which acts as an important wildlife corridor, an essential migration route and a key breeding area for many nationally and internationally important species. The Upper Wye is of special interest for its associated plant and animal communities, including aquatic plants, otters, fish and invertebrates that are important in a European context. Its character spans a range of types from an upland base-poor stream to lowland river.*
- *Coedydd Llawr-y-Glyn SAC is located to the west of Caersws, within 2 km of the CC Preferred Line Route Alignment – This site consists of five separate areas of woodland situated on hill slopes around the headwaters of the River Trannon. All are dominated by, mostly even-aged, sessile oak but there are variable amounts of downy birch, hazel, holly and rowan, and in some areas pedunculate oak is also present. The ground flora in some areas is dominated by heather and bilberry, whilst in others it is grassier and herbs such as bluebell, wood sorrel and violets are more prominent. Elsewhere, ferns and mosses are abundant and form the major botanical interest.*
- *Berwyn a Mynyddoedd De Clywd (Berwyn and South Clwyd Mountains) SAC is located to the north-west of the BNC and BSC Preferred Line Route Alignments – This is a large upland site, containing the largest area of blanket bog and European dry heath in Wales. This SSSI is predominantly a mixture of dry heath and blanket bog vegetation with patches of transition mire and quaking bog vegetation found as an intricate mosaic.*

7.129. There are ten sites of national importance within a 2 km radius of the Indicative DCO Site Boundary:

- *The Gweunydd Camnant SSSI is of special interest because it supports a large population of the greater butterfly-orchid. Other locally uncommon plant species recorded include adder's-tongue and smooth brome. The fields are bordered by species-rich hedgerows and deciduous and coniferous woodland. This SSSI is designated for habitat mosaics including herb-rich neutral grassland, marshy grassland and mires.*
- *River Ithon SSSI is part of the River Wye system, comprising the River Wye and several of its tributaries including the River Ithon, represents a large, linear ecosystem, which acts as an important wildlife corridor, an essential migration route and a key breeding area for many nationally and internationally important species. The River Ithon is of particular interest for aquatic habitats, fish and otter populations.*

- *Gweunydd Esgairdraenllwyn (Esgairdraenllwyn Pastures) SSSI - This SSSI includes a large area of pasture land supporting a range of vegetation types and a rich variety of plants, including a number of locally uncommon species. The most frequent plant community is unimproved acid grassland, which has transitions to associated marshy grassland, swamp and riparian habitats. The River Ithon, which flows through this SSSI, provides an important habitat for otters and fish.*
- *Coid Hafor-Fraith SSSI – This SSSI is a good example of sessile oak woodland with plentiful rowan and a ground layer dominated by moss carpets on freely draining soils. Wetter areas adjacent to streams increase the variety of plant species present and the occurrence of the oak fern is of particular interest.*
- *Coed Craig-iar SSSI - This SSSI is a good example of sessile oak-birch woodland with a variable quantity of hazel understorey. There are, however, a number of different acidic woodland types present, including pure high forest oak, birch-hazel, birch areas and a local development of birch-alder-willow carr. A large number of flowering plant species have also been recorded. Marsh arrowgrass, an uncommon plant, has been recorded.*
- *Llyn Mawr SSSI - This SSSI is a good example of a moderately nutrient-poor upland lake in a catchment only partially modified by agricultural improvement. The main marginal vegetation consists of thin, scattered beds of bottle sedge. This SSSI is of considerable ornithological importance and is extensively used by waterfowl. In summer, typical species are mallard, tufted duck and goosander, whilst in winter species include whooper swan.*
- *Gweunydd Dolwen SSSI – This SSSI is of special interest for its acid and neutral dry grassland. The stands of dry acid grassland are dominated by sheep's fescue and common bent together with characteristic forbs such as betony, common bird's-foot-trefoil and bitter-vetch. Other plant species, indicative of agriculturally unimproved grassland swards, are present, including a population of the uncommon greater butterfly-orchid.*
- *Bryn Coch SSSI – This SSSI is of special interest for its lowland fen and acid grassland. The fen and associated wetland vegetation has developed at the watershed between two streams. It contains an exceptional variety of vegetation types. This variety can be broadly described as consisting of areas of bog vegetation on deep peat (including bog pools), areas of rich and transitional fen vegetation occupying what appear to be former and now re-vegetated peat cuttings, acidic and base-rich flushes, fen-meadow and marshy grassland. The extent of acid grassland is impressive for lowland Montgomeryshire. Most of the dry grassland is species-rich, indicating a lack of agricultural improvement.*
- *Coed y Lawnt a Coed Oli SSSI - This SSSI is a good example of a wet hillside woodland characterised by birch, with a significant amount of alder and including a wet moss carpet in the ground layer. Species with a good representation are ferns, notably hard fern, lady-fern and soft shield-fern, and moisture-loving plants such as opposite-leaved golden-saxifrage, bog stitchwort and marsh violet.*
- *Corl Llyn Coethlyn SSSI - This SSSI is a good example of a valley mire system. It supports three vegetation types of outstanding interest – extensive areas of bog-moss lawn, mid-nutrient areas with slender sedge, and birch/ willow carr.*

7.130. There are no national or local nature reserves within 2 km radius of the Indicative DCO Site Boundary.

7.131. There are 244 ancient woodland sites within 1 km of the Indicative DCO Site Boundary, of which 144 are ancient and semi natural woodland, 61 are restored ancient woodland sites, 33 are plantation on an ancient woodland site and six are ancient woodland sites of unknown category. There are 27 ancient woodland sites within the Preferred Line Route Alignments, of which 19 are ancient and semi natural woodland, one is restored ancient woodland, six are plantation on an ancient woodland site and one is of unknown category.

7.132. There are two sites of international importance for bats within a 30 km radius of the Indicative DCO Site Boundary, as follows:

- *Tanat and Vyrnwy Bat Sites SAC - This site has been selected because of its population of lesser horseshoe bats, which is of European importance. This SSSI consists of six separate sites, all situated within the north-eastern part of Montgomeryshire. Two of the sites contain buildings that house maternity roosts, whilst the other four are disused mines containing hibernation roosts. Five of the sites also contain a small amount of associated habitat, in the form of broadleaved woodland or hedgerows.*
- *Coedydd Derw a Safleoedd Ystlumod Meirion (Meirionnydd Oak Woods and Bat Sites) SAC – This SAC comprises old sessile oak woods with Ilex and Blechnum, alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae), water courses of plain to montane levels with the Ranunculion fluitans and Callitricho-Batrachion vegetation, northern Atlantic wet heaths with Erica tetralix, European dry heaths, Tilio-Acerion forests of slopes, screes and ravines and bog woodland. Lesser horseshoe bats are also a qualifying feature of the SAC.*

7.133. Some habitats within the Indicative DCO Site Boundary are habitats of Principal Importance for the conservation of biodiversity in Wales (according to Section 42 of the NERC Act 2006 (Ref. 7-11)) and are Powys BAP habitats. Such habitats include field margins, hedgerows, lowland grassland, peatland habitats, rivers and streams, ponds and semi-natural broad-leaved woodland.

7.134. A summary of existing data and baseline information is provided below. Information on habitats is based upon assessment of desk study data and data collected in the field to date. There is a wide range of habitats within the Indicative DCO Site Boundary, and these include:

- *Broadleaved woodland;*
- *Plantation woodland;*
- *Peatland habitats (including blanket bog, heath, flush and mire habitats);*
- *Hedgerows;*
- *Scrub and Ffrid;*
- *Grassland (including unimproved, semi improved, improved marshy and amenity grassland);*
- *The River Wye headwaters;*
- *Other aquatic habitats and wetland (such as dry and wet ditches, standing and running water, fen, swamp);*
- *Arable land; and*
- *Other habitats (such as tall ruderal, ephemeral, bare ground, and hard standing).*

Notable Plants

7.135. There is potential for the presence of a number of UK BAP (Ref. 7-10) species of vascular plant within the Indicative DCO Site Boundary, including river jelly lichen (listed under the Wildlife and Countryside Act 1981 (as amended) (Ref. 7-15) occurring in the River Wye catchment). Additionally pillwort (still water margins) and slender green feather moss (wet flushes) are also highlighted in the SER as potentially occurring.

Invasive Plants and Animals

7.136. Japanese knotweed (Fallopia japonica), giant hogweed (Heracleum mantegazzianum) and Himalayan balsam (Impatiens glandulifera) are recognised as invasive species and listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15), which makes it an offence to plant these species or otherwise cause it to grow in the wild. These species, together with other species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), may be present within the Indicative DCO Site Boundary and will require consideration as part of the EcIA.

7.137. Invasive animal species such as signal crayfish (Pacifastacus leniusculus) are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), which makes it an offence to release these species or otherwise cause them to escape into the wild. This species, along with other animal species listed, may be present Indicative DCO Site Boundary and will require consideration as part of the EIA.

Ornithology

- *With regards to winter birds, surveys to date indicate that:*
- *The Indicative DCO Site Boundary does not cross areas containing significant numbers of waterfowl and therefore collision risk to birds is unlikely to be identified as a significant impact in the EIA;*
- *The wintering whooper swans in the Severn Valley were found to be sedentary throughout the survey period in fields at least 6 km from the Indicative DCO Site Boundary; and*
- *Whilst a large number of herring and lesser black backed gulls were noted on flooded fields, especially near the CC1 Preferred Line Route Alignment around Trefeglwys, gulls are not considered to be at risk from overhead transmission wires. Therefore no assessment of risk has been made.*

7.138. With regards to breeding birds, surveys to date indicate that:

- *A low number of breeding raptors were identified within the breeding birds study area (see Table 7.1). This is to be expected as the alignment of the Preferred Line Route Alignments has been designed to avoid areas of potential raptor breeding habitat, such as woodland, as much as possible. The open areas of the Preferred Line Route Alignments are not considered suitable for raptors (such as hen harrier) and no birds have been seen in these areas during various breeding season surveys for wind farms, as recorded during preparation of the Strategic Ecological Report, or other surveys undertaken by Ecology Matters over recent years;*
- *Two raptor breeding sites were found within the breeding birds study area - a red kite at Ddulli Bank and a possible breeding site for goshawk at Allt y Genlli;*
- *There were two very brief sightings of hobby and no breeding raptors were located within the breeding birds study area; and*
- *Curlews were found at previously known sites and no new pairs were found.*

7.139. The areas affected by the presence of nesting curlew are the southern section of the CC1 Preferred Line Route Alignment, with one definite and one probable breeding pair within the Preferred Line Route Alignment. The whole of this section between Penygarreg (SO066834) and Pegwn Bach (SO017803) is suitable habitat for breeding curlew. The northern section of CC1 Preferred Line Route Alignment is also suitable breeding habitat for curlew, from Blaenglanhanog (SN955998) to Bryngwyn (SJ001014). This area also includes the final part of BNC1 Preferred Line Route Alignment. There were three pairs of curlew breeding at the junction of various corridors, and one just outside. There was also one pair breeding within the northern part of BNC1 Preferred Line Route Alignment and several of the fields in the immediate area are considered suitable for curlew. The start of BNC1 Preferred Line Route Alignment at Cwmderwen (SH950054) is an area suitable for curlew, although none were recorded during the previous survey.

Protected or Otherwise Notable Species

7.140. Assessment and a review of online sources during the SER and SER2 gives an indication of the likely presence of protected or otherwise notable species within the Indicative DCO Site Boundary. A summary of results from the desk study together with data gathered during the Extended Phase 1 Habitat Survey is provided below:

- *Badger (Meles meles) are protected under the Protection of Badgers Act 1992, which makes it an offence to kill or injure badgers, disturb badgers within their setts, or cause damage to or obstruct a badger sett. Badgers are likely to be present in low densities across much of the Indicative DCO Site Boundary, where suitable habitats occur, as highlighted in the SER and SER2.*

- *Water Vole (Arvicola amphibius) is afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref. 7-15). The water vole is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006) (Ref. 7-11). Water vole is a UK BAP Priority species and is also listed on the Powys BAP. The desk study revealed relatively low levels of records for this species within the Indicative DCO Site Boundary.*
- *Otter - (Lutra lutra) is a European Protected Species that is afforded protection by Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 2010 (as amended) (Ref. 7-40); and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15). The otter is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). Otter is a UK BAP Priority species and is also listed on the Powys BAP. Otters are widespread throughout Wales, utilising habitats from unpolluted river systems and lakes to marshes, streams and canals. In the SER it is anticipated that otter may be present in the majority of watercourses. Otter were identified in nine of the ESs that were reviewed as part of the SER2 process.*
- *Dormouse - (Muscardinus avellanarius) is a European Protected Species that is afforded protection by Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 2010 (as amended); and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15). It is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). The dormouse is a UK BAP Priority species and is also listed on the Powys BAP. The desk study identified dormouse presence within five of the ESs that were reviewed as part of the SER.*
- *Bats - All bats and their roosts receive full protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15) and Schedule 2 of the Conservation (Natural Habitats, & c.) Regulations 2010 (as amended). Lesser horseshoe bat and pipistrelle bats are listed on the Powys BAP. Various records of bats were identified within the study area. A review of the SER and SER2 indicated that the following species may be present within Indicative DCO Site Boundary: Myotis species, Leisler's, lesser horseshoe, Daubenton's, serotine, brown long-eared, common pipistrelle, soprano pipistrelle, noctule, and nathusius pipistrelle. There is suitable foraging, commuting and roosting habitat within the Indicative DCO Site Boundary.*
- *Red Squirrel - Red squirrel (Sciurus vulgaris) is a European Protected Species that is afforded protection by Schedule 2 of the Conservation (Natural Habitats &c.) Regulations 2010 (as amended); and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15). It is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). The red squirrel is a UK BAP Priority species and is also listed on the Powys BAP. The SER and SER2 indicated that coniferous woodland of sufficient area and connectivity to support a viable red squirrel population are uncommon within the Indicative DCO Site Boundary and it is likely that populations are spread out along interconnected valleys, rather than located at individual 'hotspots'.*
- *Birds - All nesting wild birds are afforded protection under the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15). The desktop study and consultation exercise have highlighted significant ornithological interests within the Indicative DCO Site Boundary. These include the potential presence of waders and wildfowl (e.g. in the Cefn Coch area), raptors and breeding bird species. Surveys undertaken in the Cefn Coch area indicate the presence of a number of Schedule 1 species (species that are fully protected under the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15), including; hen harrier, peregrine falcon and red kite. Other raptors (include kestrel, sparrowhawk and short-eared owl) were also recorded in this area together with a number of waders including curlew, golden plover, lapwing and snipe. The 2013-2014 wintering bird surveys found the following species to be present within the bird study area (see Table 7.1): coot, dabchick, buzzard, red kite, sparrowhawk, whooper swan, mute swan, goosander, mallard, golden eye, tufted duck, cormorant, teal, widgeon, lapwing, herring gull, common gull, heron, fieldfare, redwing, starling, waxwing and raven. Key locations for these sightings included Llyn Mawr, Llyn Du, Aberhafesp Church, Aberhafesp Layby and Severn Crossing.*

- *Amphibians – the great crested newt (Triturus cristatus) is protected by the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15) and the Conservation (Natural Habitats & c) Regulations 2010 (as amended). It is a UK BAP Priority species and is also listed on the Powys BAP. It is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006).The SER and SER2 identified one 'large' population within the Llanbadarn (Fynydd) wind farm ES. The presence of great crested newt within the Indicative DCO Site Boundary is anticipated to be scattered and limited to the types of aquatic and terrestrial habitats preferred by this species.*
- *Reptiles - All native reptiles are protected from intentional killing or injury under the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15) and all are listed as species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). Slow worm, grass snake, common lizard and adder are all identified as priority species on the UK BAP. Incidental records of common lizard were identified for several wind farm schemes across the SER2 study area, and therefore they are likely to be present in suitable habitat within the Indicative DCO Site Boundary.*
- *Brown Hare - (Lepus europaeus) is a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). Brown hare are a UK BAP Priority species and are also listed on the Shropshire BAP and Powys BAP. Suitable habitats for this species occur commonly within the Indicative DCO Site Boundary.*
- *Hedgehog – (Erinaceus europaeus) is afforded protection under Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) (Ref 7-15). The hedgehog is also a species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006). Hedgehogs are also a UK BAP priority species. Suitable habitats for this species occur within the Indicative DCO Site Boundary.*
- *Invertebrates - The within the Indicative DCO Site Boundary include a wide range of habitats that will support both terrestrial and aquatic invertebrate interest. The SER and SER2 desk study indicated records of high brown fritillary and silver washed fritillary butterflies. Further desk study research will highlight the potential species of terrestrial and aquatic invertebrates listed on either the UK or Local BAP, and/or species of Principal Importance for the conservation of biodiversity in England (under Section 42 of the NERC Act 2006) that may be present within the Indicative DCO Site Boundary.*
- *Fish – The Salmon and Freshwater Fisheries Act 1975 (Ref. 7-41) protects the spawning grounds, and spawn, fry and parr of salmonid fish. It also includes provision to prohibit mechanisms for obstructing the passage of fish, and to prohibit particular methods of taking or destroying fish. Fish species listed in the Powys BAP include allis shad, twaite shad, brown trout and river lamprey, all of which are listed in Annex ll of the European Habitats Directive (Ref. 7-38) and for which SAC sites may be designated. The River Wye SAC headwaters is within the CC Preferred Line Route Alignment and is designated, in part, for the presence of a number of Annex ll fish species, including sea lamprey, brook lamprey, river lamprey, twaite shad, Atlantic salmon and bullhead.*

Aspects of Development Likely to Cause Significant Effects

7.141. The assessment of the potential effects of the Proposed Development will take into account both on-site impacts and those that may occur to adjacent and more distant ecological features. Effects can be positive or negative. Negative effects can include:

- *Direct loss of wildlife habitats;*
- *Fragmentation and isolation of habitats;*
- *Disturbance to species from noise, light or other visual stimuli;*
- *Direct loss of species;*
- *Damage to species and habitats;*
- *Disturbance in the operational phase including from tree clearance along lines;*
- *Collisions of species with wires;*

- *Electrocution of species;*
- *Introduction of non-native species;*
- *Risk of fire;*
- *Changes to key habitat features; and*
- *Changes to the local hydrology, water quality and/ or air quality.*

7.142. The EcIA will include predictions of potential impacts and the resulting effects on ecological receptors. Based on the information available at the time of the preparation of this EIA Scoping Report, examples of potential effects on ecology and nature conservation resources could include:

7.143. Effects resulting from potential impacts on European designated sites;

7.144. Effects resulting from potential impacts that may occur on protected sites (national and international sites);

- *Effects resulting from the construction of the Proposed Development;*
- *Effects resulting from potential collision impacts on birds;*
- *Short sections of underground cable can lead to temporary habitat losses and severance of habitat connections;*
- *Effects on the water quality of aquatic habitats beyond the Indicative DCO Site Boundary (Table 7.1) as a result of run-off during construction;*
- *Small areas of habitat would be lost due to permanent land-take for the wood pole structures/ towers; and*
- *If suitable mitigation were not undertaken, there is a risk of killing, injuring and disturbing legally protected species in discrete areas, including: great crested newt, reptile, breeding bird, badger, water vole, otter, dormouse, white clawed crayfish and bats.*

7.145. Some disturbance to protected species would be expected as a result of noise, vibration, air emissions (dust), air pollution from vehicles and presence of people associated with construction activities. This may particularly affect areas of valuable vegetation, badger setts located within 30 m of the construction footprint, and birds, bats, amphibians and reptiles located within and immediately adjacent to the construction footprint.

Potential for Mitigation

7.146. Where possible, potential significant ecological effects have been and will continue to be avoided by design. For example, by:

- *Routeing the 132kV overhead lines to avoid direct and indirect effects on European sites (SACs) and nationally designated sites (SSSIs);*
- *Avoiding effects on locally designated sites and valuable habitats where possible; and*
- *Including appropriate measures within the design and construction programme to avoid significant effects on legally protected species.*

7.147. Where avoidance of effects is not possible, suitable mitigation will be included within the final design (which will itself be assessed as forming part of the Proposed Development to ensure that, wherever possible, the likely residual effects are not significant).

7.148. Impact avoidance and reduction measures will be incorporated into the design that will be taken forward for consent and then construction. Such measures will be taken into account in the EcIA, so that the residual impacts assessment reflects the completed overhead lines and infrastructure. Monitoring requirements will be identified where appropriate.

7.149. For the purpose of this assessment, mitigation refers to measures that will be incorporated into the design to prevent, reduce and where possible offset significant adverse effects. In addition, opportunities to provide nature conservation enhancements will be incorporated where possible. Enhancement refers to measures that improve biodiversity but which are not specifically required for the purposes of ecological mitigation. Enhancement measures will be referred to in the ES but will not be relied on for mitigation as, by definition, they are measures over and above what SP Manweb would need to do to mitigate any significant adverse effects. Instead, they are being proposed by SP Manweb as a responsible corporate entity.

7.150. In addition to determining the significance of an effect on any ecological features, the assessment will also identify any legal requirements such as protected species licensing.

7.151. Those features that are likely to be significantly affected will be included in a summary table at the end of the EcIA. Examples of mitigation measures that might be required in order to make development acceptable in planning terms are described below.

General Mitigation

7.152. All the mitigation proposals below will be supported and supervised by the presence of an ecological watching brief throughout the main construction phase. An Environmental Management Plan (EMP) will be designed to ensure that methods of good practice are followed, that the integrity of features is maintained and they remain undamaged, and disturbance to protected species is minimised. Recommended mitigation measures will be discussed and agreed with NRW as appropriate and will be reflected in the requirements of the draft DCO as appropriate.

Designated Sites

7.153. The Proposed Development will avoid Natura 2000 sites. Following consultation with NRW, suitable measures to avoid potential impacts may include constraints on the timing of works and careful working practices. A screening assessment would be undertaken on the effects of potential impacts on the qualifying features of the three European sites that could be affected. This assessment will guide the requirement for an Appropriate Assessment under the Habitats Regulations. This process will also identify any requirements for further surveys or mitigation measures to inform the ES.

7.154. The Proposed Development is likely to avoid SSSIs. Consultation with NRW may be necessary to identify mitigation measures for nearby SSSIs which may include pollution prevention measures, careful timing of works, and post construction monitoring.

Notable Habitats

7.155. Mitigation against permanent and temporary loss of habitats during construction of the Proposed Development will include approaches such as minimising working areas, habitat translocation (e.g. careful lifting, storage and reinstatement of grassland, soils etc.) and/ or habitat reinstatement using an appropriate species mix. Measures (e.g. high visibility fencing, signage etc.) to protect more sensitive habitats (such as peatland, fen, bogs, marshy grassland, woodland, hedgerows, ponds and watercourses) in close proximity will also be adopted.

Protected and Notable Species

7.156. There may be impacts on birds. Measures to avoid or reduce impacts on birds may include the use of alternative technologies (such as undergrounding); this in turn will reduce the need for mitigation measures for birds. However, where there is a collision risk, there may be a need for the implementation of deterrents, such as flight diverters on the overhead lines. Measures to minimise disturbance to breeding birds during construction will include removal of any vegetation outside the bird breeding season (early February to end August). If this is not possible, an ecologist will check the area for nesting birds 24 hours prior to commencement of works. No construction should take place within 500 m of a Schedule 1 species between March and August. A repeat survey for raptors will be required immediately prior to construction as birds are highly mobile.

7.157. In addition to the measures required for nesting birds, a project-specific protection plan will be prepared in respect of curlew. This 'Curlew Protection Plan', which will be required during the construction period, will include careful timing of works within a clearly defined protection zone (e.g. up to 800 m) around any known nesting sites for this species. Operational effects upon curlew will also be taken into account and mitigation provided where relevant.

7.158. Liaison with NRW will be required when designing suitable mitigation measures for birds.

7.159. Construction may have a temporary impact on the great crested newt. If great crested newts are found during surveys, mitigation measures may be required. Given the likely small scale nature of impacts it is considered that mitigation would encompass targeted vegetation management and site supervision implemented according to an agreed method statement. If relevant, a licence (legal derogation from the provisions of the Conservation of Habitats and Species Regulations 2010) may be required for certain works that would result in an otherwise unlawful activity such as damage to a great crested newt breeding site.

7.160. The habitat mosaic of woodland, hedgerows and farmland provides suitable habitat for badgers, so consequently some disturbance to badgers could arise during the construction phase. Where the working area is within 30 m of any badger setts, appropriate measures to limit disturbance will be undertaken. A NRW licence may be required if works are carried out close to an active sett or if there is any risk of a breach in the legislation.

7.161. There may be a temporary impact on reptiles. Suitable mitigation measures will be followed to minimise these impacts. Appropriate measures may include vegetation management and supervision according to an agreed method statement. A finger-tip search prior to clearance of any suitable vegetation will also be undertaken.

7.162. The habitats within the within the bat study area (see Table 7.1) provide suitable foraging and roosting habitat for bats. To minimise impacts on bats during the construction phase, works should be carried out during the day to avoid disturbance to bats from lighting. If any trees or buildings with potential to support roosting bats need to be removed, suitable mitigation will be provided and appropriate licenses acquired.

7.163. Suitable mitigation measures will be implemented to minimise potential effects on white clawed crayfish. Appropriate measures may include careful timing of works, careful removal (under the appropriate license) from working areas and relocation to an alternative suitable habitat away from the area of works.

7.164. Suitable mitigation measures will be implemented to minimise potential temporary and/ or permanent effects on dormouse and other species of note (red squirrel, pole cat, pine marten, hedgehog, common toad, and fish species). Appropriate measures may include careful timing of works, careful removal (under the appropriate license) from working areas and relocation to an alternative suitable habitat away from the area of works.

Summary and Conclusions

7.165. This Chapter of the EIA Scoping Report summarises the baseline conditions of the within the Indicative DCO Site Boundary, as well as detailing the extent of the surveys anticipated to be required to complete the Ecological Impact Assessment for the Proposed Development in line with the relevant guidelines.

8.0 LANDSCAPE AND VISUAL

Introduction

8.1. This Chapter of the EIA Scoping Report sets out the approach to the Landscape and Visual Impact Assessment (LVIA) for the Proposed Development (as described in Chapter 2), which will be undertaken and provided as part of the ES.

8.2. This section also sets out the approach to the Cumulative Landscape and Visual Impact Assessment (CLVIA) and residential visual amenity assessment for the Proposed Development which will be undertaken and provided as part of the ES.

Guidance and Data Sources

8.3. The assessment will be carried out in accordance with Guidelines for Landscape and Visual Assessment Impact Assessment (GLVIA) published by the Landscape Institute and IEMA (Third Edition) (Ref. 8-1). GLVIA is the established good practice guidance for landscape and visual impact assessment.

8.4. The third edition was published in April 2013 and takes account of changes since 2002 when the second edition was published. Since then the UK has both signed and ratified the European Landscape Convention, which places new obligations on Government in dealing with landscape matters. Although the principles advocated are broadly similar to the second edition, there is recognition that the previous guidance overemphasised the use of matrices and single word descriptions when arriving at judgements of significance. The third edition advocates a step by step process of evaluation, supported by clear, well-reasoned narrative text to allow the identification of significant effects to be as transparent as possible. For the purposes of the landscape and visual assessment methodology set out in this section of this EIA Scoping Report, any reference to GLVIA is a reference to the 2013 third edition.

8.5. In addition to the GLVIA, the following guidance and sources of information will be taken into account:

- *Cadw, 'Register of Historic Parks and Gardens' (Ref. 8-2);*
- *Cadw and the Countryside Council for Wales. 'Register of Historic Landscapes in Wales' (Ref. 8-3);*
- *Countryside Agency and Scottish Natural Heritage (2002). 'Landscape Character Assessment: Guidance for England and Scotland' (Ref. 8-4);*
- *Countryside Council for Wales (2010). 'Landscape Character Map for Wales' (Ref. 8-5);*
- *Landscape Institute (2011). 'Photography and Photomontage in Landscape and Visual Impact Assessment: Advice Note 01/11' (Ref. 8-6);*
- *Natural Resources Wales (NRW). 'LANDMAP' (Ref. 8-7);*
- *NRW (2013). 'LANDMAP Guidance Note 1: LANDMAP and Special Landscape Areas' (Ref. 8-8);*
- *NRW (2013). 'LANDMAP Guidance Note 3: Using LANDMAP for Landscape and Visual Impact Assessment of Onshore Wind Turbines' (Ref. 8-9).*
- *NRW (2013). 'LANDMAP Guidance Note 4: LANDMAP and the Cultural Landscape' (Ref. 8-10);*
- *NRW (2013). 'LANDMAP Methodology: Guidance for Wales: Historic Landscape' (Ref. 8-11);*
- *Powys County Council (2008). 'Powys Landscape Character Assessment' (Ref. 8-12);*
- *Powys County Council (2006). 'TAN 8 Annex D Study of TAN 8 Strategic Search Areas B (Carno North) and C (Newtown South)' (Ref. 8-13);*
- *Scottish Natural Heritage and Countryside Agency (2002). 'Topic Paper 6. Techniques and Criteria for Judging Capacity and Sensitivity' (Ref. 8-14);*
- *Scottish Natural Heritage (2012). 'Assessing the Cumulative Impact of Onshore Wind Energy Projects' (Ref. 8-15);*
- *Scottish Natural Heritage (2006). 'Visual Representation of Wind Farms Good Practice Guidance' (Ref. 8-16);*

- *Scottish Natural Heritage (2013). 'Visual Representation of Wind Farms'. Consultation Draft (Ref. 8-17);*
- *The Holford Rules: 'Guidelines for the Routeing of New High Voltage Overhead Transmission Lines with NGC 1992 and SHETL 2003 Notes' (Ref. 8-18);*
- *The Highland Council (2010). 'Visualisation Standards for Wind Energy Developments' (Ref.8-19); and*
- *Welsh Assembly Government (2005). 'Technical Advice Note (TAN) 8: Planning for Renewable Energy' (Ref. 8-20).*

Inter-relationship between the LVIA and other EIA Topics

8.6. Landscape has complementary links with other EIA topics, but has a particularly close relationship with the historic environment, ecology and socio-economic topics. The relationship between landscape and historic landscape matters is close. The first is concerned with the landscape as it is today. The second is concerned with how the landscape came to be as it is and deals with historic dimensions such as 'time depth' and historical layering. In recognition of this, the survey for the baseline landscape and visual assessment will ensure that important above ground archaeological remains and cultural heritage sites such as hillforts are recorded and judgements made as to their contribution to the landscape. Use will be made of historic landscape information and there will be liaison with the specialists undertaking the historic environment and cultural heritage assessment.

8.7. Similarly, whilst information on habitats, particularly woodlands, trees and hedgerows will be fully covered in the Biodiversity and Ecology ES chapter, changes to these habitats may have significant implications for landscape and visual interests. Information will therefore be shared and exchanged with the specialists undertaking the biodiversity and ecological assessment. Where tree removal is likely to affect the landscape or views, this will be assessed and illustrated within the relevant visualisations.

8.8. With respect to socio-economic interests, the LVIA is concerned with the contribution of tourism and recreational features to the wider landscape and how both the setting of such features and views to and from them may be affected. This should then help inform the socio-economic assessment in terms of the area's tourism/ recreation offer. Information will therefore be shared and exchanged with the specialists undertaking the socio-economic assessment.

Assessment Scope and Consultation

8.9. The LVIA will address both possible effects on the landscape in its own right and effects on views and residential visual amenity:

- *Landscape effects including direct effects upon the fabric of the landscape (such as the addition, removal or alteration of structures, woodlands, trees or hedgerows), which may change the character and perceived quality of the area, or more general effects on landscape character and designated landscapes arising from the introduction of new man-made features;*
- *Visual effects relate to specific changes in the composition of views and the effects of those changes on visual receptors (e.g. residents, business users, users of recreational open space, views to and from valued landscapes) and on the general visual amenity experienced by people[9]; and*
- *Residential visual amenity effects[10]. Residential visual amenity is a subset of residential amenity which also includes aspects such as noise, light, vibration etc. In making judgements about residential visual amenity, it is important to recognise that a significant adverse change to an outlook from a property does not in itself result in material harm to living conditions (Ref. 8-21); and*

9 GLVIA defines visual amenity as the overall pleasantness of views people enjoy of their surroundings.

10 The approach generally taken by Planning Inspectors in England is that no individual has a right to a particular view. However there may be a point when, by virtue of the proximity, size and scale of a proposed development, a residential property would be rendered so unattractive a place to live that planning permission should be refused. Whilst the assessment of whether a change in outlook materially harms residential amenity or living conditions is ultimately a planning issue, a judgement on the visual component of residential amenity is often needed from a landscape architect to inform the residential amenity assessment. It is important to note that a significant adverse change to an outlook from a property does not in itself result in material harm to living conditions, and that there needs to be a degree of harm over and above this, for example undue obtrusiveness or overbearing effect, to warrant a refusal of planning consent.

8.10. Cumulative assessment is an assessment of the additional effects, which may occur where the Proposed Development is seen in conjunction with the Associated Development and other proposed developments in the area such as the contracted wind farms or the proposed NG substation and proposed NG 400kV connection (i.e. the Related Development) as well as Other Related Development such as the SP Manweb Llandinam 132kV Overhead Line Connection Project, which is currently the subject of a conjoined planning inquiry under the Electricity Act 1989.

Consultation

8.11. A summary account of the consultations carried out up to selection of the Proposed Line Alignments and Proposed Line Route Alignments will be provided in the Landscape and Visual Amenity ES chapter, together with a full account of the consultations carried out throughout the EIA process. The LVIA will respond to all relevant comments received. Advice has been and will continue to be sought from PCC and NRW to inform the LVIA and CLVIA, including agreement on viewpoint locations and visualisation production and further refinement of the field based landscape and visual sensitivity appraisal.

Study Area for the LVIA

8.12. The Study Area for the LVIA is defined as the area within which likely significant landscape and visual effects arising as a result of the Proposed Development might occur. Study Areas referred to in this section are defined as a distance measured from the edge of the Preferred Line Route Alignments. Where there are parallel Preferred Line Route Alignments, the measurement is taken from the outermost Line Route.

Study Area for the LVIA

8.13. Due to the height of the support structures (14 m above ground for wood pole structures and 26 m for steel towers), the extent of the Study Area is primarily dependent on the visibility of the 132kV Overhead Line elements of the Proposed Development. Visibility depends on a number of factors including: distance from the viewer; the extent to which topography, vegetation, buildings or other structures partially or completely block the view; the design of the support structures (particularly their solidarity); whether the wood pole structures/ steel towers are backclothed or skylined; and their colour compared to the background scenery.

8.14. The proposed Study Area for the LVIA has been informed by field assessment of existing wood pole structures/ steel towers being undertaken for this and for other SP Manweb projects in Wales, including the consented Tirgwynt and Legacy to Oswestry overhead lines. Extensive site appraisal work during the preceding routeing stages of the SP MWC Project has also been used as the basis for determining the potential visibility.

8.15. The work has determined that whilst steel lattice towers approximately 26 m high may be visible from up to 10 km away, they are unlikely to be prominent features, particularly if they are backclothed against landform or vegetation. In practice the main landscape and visual effects are likely to occur within 3 km of an overhead line and this is where attention will be focussed - whilst being alert to potentially significant effects at a greater distance.

8.16. The Study Area for the assessment of the landscape and visual effects of the steel tower sections of the Proposed Development will therefore extend to a maximum of approximately 10 km from the edge of the Preferred Line Route Alignments, although it is anticipated that the majority of significant effects are likely to occur within 3 km.

8.17. Due to their height, material and colour, overhead lines supported by wood pole structures will be better accommodated in the surrounding landscape and more easily screened by the existing landform and vegetation than steel towers. For consistency with the remainder of the assessment however, the Study Area for the sections of overhead line supported by wood pole structures is also taken as 10 km from the edge of the Preferred Line Route Alignments. Based, however, on previous experience it is anticipated that the majority of significant effects arising from the wood pole sections of overhead line are likely to occur within 1 km.

Study Area for the Residential Visual Amenity Assessment

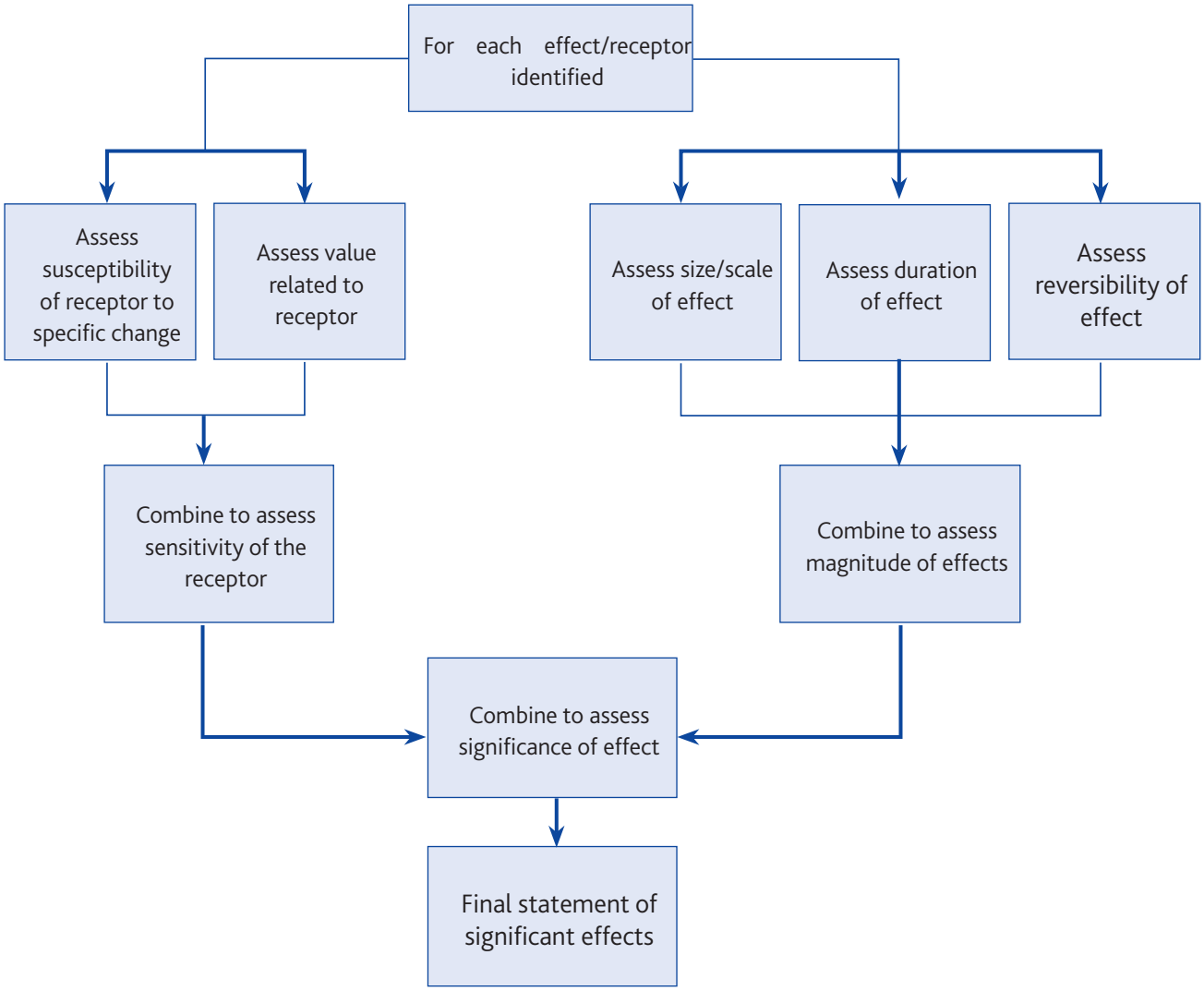
8.18. The Study Area for the residential visual amenity assessment has been informed by ongoing work being undertaken by Gillespies for three local authorities in North Wales. Based on this work, the study area will extend approximately 100 m from the edge of the Preferred Line Route Alignments for the sections of overhead line supported by wood pole structures and 300 m for the section supported by steel towers. Beyond these distances an overhead line may give rise to significant adverse visual effects but would be unlikely to cause a change in outlook which would materially harm residential amenity or living conditions.

Assessment Methods

8.19. The LVIA will systematically assess the effects of the Proposed Development on:

- *Landscape character and valued landscapes;*
- *Views and visual amenity from specific viewpoints; and*
- *Residential visual amenity of individual and groups of properties.*

8.20. The assessment process will progress through a series of iterative steps which will identify and evaluate both the sensitivity of the receptor and the magnitude of the change likely to occur, as illustrated in the following flow chart, which is taken from GLVIA.



Stages in Assessing the significance of Effect

(Source - Figure 3.5 GLVIA)

8.21. At each stage of the process, the required judgements as to the existence or significance of an effect will be determined by a combination of quantitative and qualitative assessment utilising professional opinion supported by a clearly explained rationale.

8.22. Moderate and major effects are generally considered to be significant for the purposes of the EIA Regulations (Ref. 1-6). Any effect judged to be minor or negligible is generally considered not to be significant.

8.23. Whilst the predicted changes can be adverse or beneficial, the appearance of the Proposed Development and the nature of the landscape in which it is located means that its effects are likely to be perceived as adverse. Even with mitigation and any additional enhancement measures in place, the overhead line elements of the Proposed Development in particular are likely to be perceived as a potentially discordant man-made feature.

8.24. The LVIA will consider a range of issues relevant to a specific series of landscape and visual receptors and representative viewpoints. This will allow conclusions to be drawn about the more general effects of the Proposed Development (both on its own and in combination with other proposed developments) on the landscape and visual resource of the study area, including a consideration of the potential for sequential effects.

8.25. The remainder of this section sets out in more detail the methodology for assessing the landscape and visual effects of the Proposed Development.

Assessing Landscape Effects

8.26. Landscape effects result from physical changes to the fabric of the landscape arising, such as the addition, removal or alteration of landscape elements and aesthetic or perceptual characteristics that make a particular landscape distinctive.

8.27. Landscape character assessment considers the effects on the individual components (both physical and aesthetic or perceptual) of the landscape as well as on its overall character.

8.28. Effects on the landscape can result from:

- *Direct physical changes to landscape elements or features (such as removal of trees to facilitate construction);*
- *Changes to how the landscape is experienced particularly those arising from the introduction of man-made elements into a landscape perceived as unspoilt, tranquil or remote;*
- *Changes to the overall character, quality and condition of the landscape resulting from changes to its particular combination of elements, and aesthetic and perceptual aspects; and*
- *Changes to valued landscapes including those that are statutorily designated landscapes or landscapes of recognised value, for example Historic Landscapes and Historic Parks and Gardens on the registers compiled by Cadw/ NRW and International Council on Monuments and Sites (ICOMOS) UK and regionally/ nationally promoted tourism/recreation sites and routes.*

8.29. By considering the nature or sensitivity of the landscape, the nature and degree of change predicted and the variation in these factors along the length of the Proposed Development, the landscape assessment will identify these effects and their implications for the integrity and character of the landscape as a whole.

Assessing the Sensitivity of Landscape Receptors

8.30. Landscape sensitivity is determined by combining an assessment of the susceptibility of the landscape to change arising with a judgement about the value attached to the landscape.

Susceptibility to Change of Landscape Receptors

8.31. As defined in GLVIA (para. 5.40), 'susceptibility to change' means the ability of the landscape or its individual components "*to accommodate the proposed development without undue negative consequences for the maintenance of the baseline situation and/ or the achievement of landscape planning policies and strategies*". Judgement of susceptibility is particular to the specific characteristics of the proposed development and the specific landscape in which it is proposed.

8.32. Many factors contribute to the susceptibility of the landscape to the development of 132kV overhead lines. Each landscape has its own key characteristics or combinations of elements and features which define its character and help to give an area its particular characteristics or sense of place and each of these characteristics can have different susceptibilities to the type of change likely to arise. Criteria relating to different categories of susceptibility to change are classified based upon a three-point scale as set out in Table 8.1 below. These criteria are indicative only. In all cases, a narrative commentary will be provided as part of the LVIA, to describe and justify the criteria levels ascribed to each receptor.

Table 8.1 | Susceptibility of Landscape Receptors

Susceptibility	Description
High	Landscape receptors, which taking into account their character and general visibility are highly susceptible to any changes likely to arise from the proposed development of an overhead line taking into account their existing character. The existing landscape has little or no ability to accommodate an overhead line without adverse effects.
Medium	Landscape receptors, which taking into account their character and general visibility are moderately susceptible to any changes likely to arise from the proposed development of an overhead line. The existing landscape has some ability to accommodate an overhead line without adverse effects.
Low	Landscape receptors, which, taking into account their character and general visibility, have low susceptibility to the changes likely to arise from overhead line development. Overhead line development can be accommodated into the existing landscape without undue adverse effects.

Value of Landscape Receptors

8.33. The relative value or importance attached to an area of landscape is similarly a reflection of many factors. In a policy context the usual basis for recognising highly valued landscapes is through the application of local or national designations. GLVIA recognises that although an area of landscape may not be designated, this does not mean it has no value. Similarly the European Landscape Convention promotes the need to consider all landscapes, with less emphasis on the special and more recognition that ordinary landscapes also have their value. In non-designated landscapes the aim is to identify the value of the landscape at a specific scale, identify the receptors to which it is important, and the reasons why the landscape is important to those receptors.

8.34. A range of factors can assist the identification of valued landscapes. These can be based on existing evidence such as landscape character assessments, planning policies, landscape strategies and guidelines or data derived from new survey and analysis. In addition to identifying any landscape or landscape related designations which may apply, the starting point for this assessment will be LANDMAP and the overall evaluations provided for each of the five aspects. These will be mapped and overlain to see where there are concentrations of more highly valued landscapes. The output from this will be supplemented by a range of criteria which will be used to judge the relative value of different area soft landscape including: the presence/absence of statutory landscape designations; presence/ absence of local landscape designations and associated policies; landscape quality/ condition; scenic quality; biodiversity and historic interest; recreational value and perceptual aspects.

8.35. An area of landscape considered to be of relatively high value will typically be in good condition with intact landscape features and elements; it may have high scenic quality or be remote and tranquil, and may be one in which recreational, biodiversity or historic features make a positive contribution to its character. Conversely an area of landscape considered to be of lower value is likely to be in poor condition with few intact landscape features and elements, be of low scenic quality, is quite disturbed by human influences, and has few recreational, biodiversity or historic features.

8.36. As noted in GLVIA, value can apply to landscape as a whole or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the overall character of the landscape. Landscapes may be valued at the international/ national level, local authority level or community level.

8.37. The relationship between the value attached to a landscape receptor and its susceptibility to change is complex. GLVIA (para. 5.4.6) notes that valued landscapes do not, automatically or by definition, have high susceptibility to all types of change. It is possible for an internationally, nationally or locally important landscape to have relatively low susceptibility to change resulting from the particular type of development, by virtue of both the characteristics of the landscape and the nature of the proposal. The particular type of change or development proposed may not compromise the specific basis for the value attached to the landscape. Nevertheless, whilst value does not necessarily equate with suitability or lack of suitability for a proposed development, it does help inform wider judgments of sensitivity and significance of effect and will therefore be included in the assessment process as described below.

Field Based Landscape Sensitivity Appraisal

8.38. In order to take into account the specific local context, a field-based landscape and visual sensitivity appraisal of the landscape along the pre-scoping route corridors to 132kV overhead lines was undertaken and provided in SP Manweb's Field-Based Landscape Sensitivity in Relation to Overhead Lines Report (March 2012). This appraisal identifies a number of criteria linked to guidance provided in the Holford Rules which were used to assess the susceptibility of the landscape to the changes likely to arise from the introduction of a 132kV Overhead Line. These criteria were applied to the Broad Route Corridors (as they were at the time) and provided an overall judgement of the relative sensitivity of the landscape along them using five-tiers of categorisation, high, medium-high, medium, medium-low, and low.

8.39. The appraisal has since been reviewed with NRW and PCC (April 2014) and an updated version of the methodology is included at Appendix B of this EIA Scoping Report. The updated methodology also reflects the latest guidance on sensitivity appraisals provided in GLVIA, which includes the requirement to consider the relative susceptibility and value of the landscape. The outputs of the field based landscape and sensitivity appraisal will be revisited and refined in the light of this updated methodology and will be based on the specific technology identified that will sit within each of the Preferred Line Route Alignments. The output will be used as the baseline for the landscape assessment and to inform the identification of mitigation measures.

Making Judgments

8.40. The susceptibility to change of each landscape receptor and its value will then be considered together to give an overall judgement of sensitivity for each receptor.

8.41. Landscape characteristics and values do not readily lend themselves to scoring, and different criteria may carry different weights in different types of landscape and with different types and scales of development. Instead, professional judgement supported by reasoned explanation will be used to categorise the landscape receptor into one of five tiers of sensitivity - high, medium-high, medium, medium-low and low.

Assessing the Magnitude of Landscape Effects

8.42. Magnitude of effect relates to the likely nature and scale of changes to landscape elements, features and characteristics arising and the consequential effects on overall landscape character. The nature of change predicted for a linear development can vary from a major or fundamental alteration to some aspect of the landscape through to a localised alteration which has a detectable but relatively insignificant effect on its character.

8.43. Each effect on landscape receptors will be evaluated against the baseline landscape in terms of its size or scale, the geographical extent of the area influenced and its duration and reversibility as explained in GLVIA (para. 5.49).

Size or Scale

8.44. Judgements about the size or scale of effects on landscape receptors take account of the degree to which a proposed development changes the character of the landscape, and/ or affects its key characteristics.

8.45. The size and scale of an effect will be determined by considering the amount of change experienced by a landscape receptor, based on the indicative criteria set out in Table 8.2.

Table 8.2 | Size or Scale of Change – Landscape Effects

Size or Scale	Description
Large	Total loss or major alteration to key features/elements/characteristics of the baseline landscape or its overall character and how this is perceived and/or introduction of features considered to be totally uncharacteristic when set within the attributes of the receiving landscape. In a designated landscape, the development is likely to affect the integrity of the designation or the reasons for why it is designated.
Medium	Partial loss or alteration to key features/elements/characteristics of the baseline landscape or its overall character and how this is perceived and/or introduction of features that may be prominent but may not necessarily be considered to be substantially uncharacteristic when set within the attributes of the receiving landscape.
Small	Minor loss or alteration to key features/elements/characteristics of the baseline landscape or its overall character and how this is perceived and/or introduction of features that may not be uncharacteristic when set within the attributes of the receiving landscape. The perception of the landscape remains broadly the same.
Negligible	Very minor loss or alteration to key features/elements/characteristics of the baseline landscape or its overall character and how this is perceived and/or introduction of elements that are not uncharacteristic with the surrounding landscape – approximating the 'no change' situation.

Geographical Extent

8.46. This is distinct from consideration of size or scale and varies depending on the project. GLVIA (para. 5.50) notes that effects are typically experienced at the scales set out in Table 8.3.

Table 8.3 | Geographical Extent of Landscape Effects

Geographical Extent	Description
Large	Widespread effects potentially affecting several landscape character areas at some distance from the proposed development.
Medium	Effects which would be experienced wholly/largely within the landscape character area(s) through which the proposed development is located.
Small	Localised effects experienced across a small area and will potentially only affect landscape character close to the proposed development. It would not be experienced within the wider landscape.
Negligible	Barely perceptible landscape effects.

8.47. The two factors that contribute to the assessment of magnitude of landscape effect will then be considered together to derive an overall magnitude of change for each landscape receptor, which is determined by use of professional judgement supported by reasoned explanation.

Duration and Reversibility

8.48. The duration of effect will be recorded separately and will not influence the assessment of magnitude. For example it may be possible for construction activities to result in a high magnitude of effect on the landscape albeit that such effects may be temporary.

8.49. In referring to duration of effects the following terminology applies:

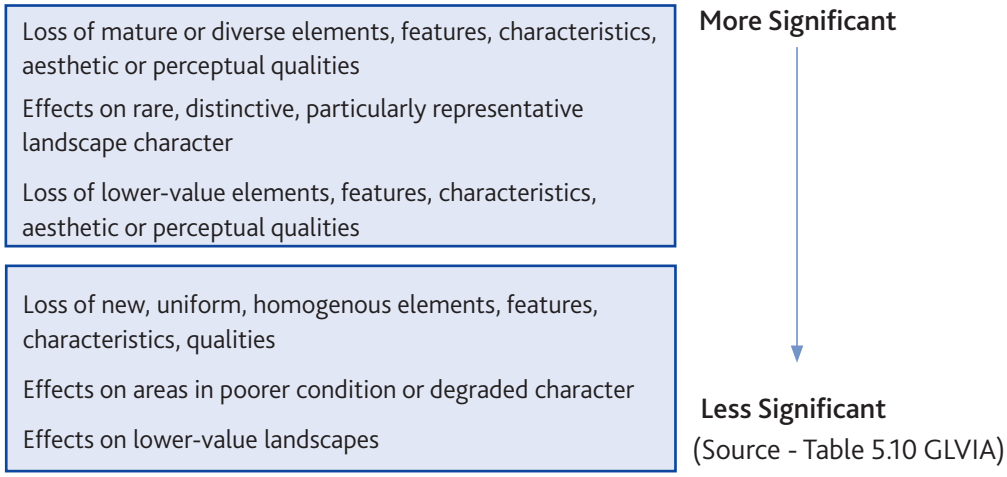
- *Short term – zero to five years;*
- *Medium term – five to fifteen years;*
- *Long term – over fifteen years; and*
- *Decommissioning.*

Judging the Overall Significance of Landscape Effects

8.50. The overall significance of a landscape effect is determined by combining the separate judgements about the sensitivity of the landscape receptors with the magnitude of landscape effects to allow a final judgement to be made about whether each effect would potentially be significant in terms of the EIA Regulations.

8.51. There is no specific definition in any guidance as to what constitutes a significant landscape or visual effect in a broad planning context and what weight should be attached to it. GLVIA requires the assessment of significance to be clearly defined and for any judgements to be as transparent as possible and provides a gradation of significance as illustrated below.

Scale of Significance of Landscape Effects



(Source - Table 5.10 GLVIA)

8.52. The final overall judgement of the likely landscape effects will be summarised in a series of four categories of significance – major, moderate, minor, negligible. In addition, a final statement summarising the significant effects that are likely to influence the outcome of the decision making process will be provided.

8.53. A landscape will not necessarily be significantly adversely affected if the proposed change can be accommodated (e.g. if it can be comfortably set into the landform and pattern of the landscape), and/ or mitigation in-keeping with its character can be effectively applied to blend the Proposed Development into the landscape. Conversely, effects may be more significant in a landscape where the 132kV Overhead Lines cannot be readily accommodated or where mitigation and integration are more difficult. In general, more significance is likely to be placed on large scale, long term or permanent changes, particularly in combination with a highly sensitive landscape, than small changes or changes involving features already present within the view.

Assessing Visual Effects

8.54. Visual effects assessment is the assessment of effects on views and visual amenity as experienced by people (referred to in LVIA as 'visual receptors'). This may include people living or working in the area, people passing through using various forms of transport, people visiting promoted landscapes or attractions and people engaged in different types of recreation.

8.55. The assessment will consider the likely significant effects from a series of viewpoints representing the views experienced by different groups of people with the aim of identifying changes in their view or visual amenity because of the Proposed Development. The assessment will be undertaken iteratively with the micro-routeing of the Line Alignments that sit within the Line Routes to ensure that visual intrusion is minimised.

Mapping Visibility

8.56. The first stage in the assessment process is to establish the areas from which the Proposed Development may be seen and the extent and nature of existing views from those areas.

8.57. This involves defining the zone of visual influence, which is the area from which it is estimated that the proposed development will be visible. This has been undertaken initially as part of the routeing process (unpublished) through analysis of landform, followed by extensive field survey to identify features which might screen views and to identify potential visual receptors.

8.58. Assessments of this type typically produce a computer generated Zone of Theoretical Visibility (ZTV) to help identify areas from where a proposed development may be visible. These are based on information about landform overlain with information about the location and height of built development. This has not been undertaken in the case of the Proposed Development, as the general pattern of visibility within the study area and the nature of 132kV Overhead Lines would not provide meaningful results. Throughout the routeing process, SP Manweb has sought to minimise the degree of visual intrusion through careful routeing, for example by utilising landform and trees to provide screening and by seeking to retain an appropriate distance from settlements and viewpoints. The locally undulating terrain and localised mature tree cover combined with the scale of the overhead lines will help to screen many views.

8.59. As the Preferred Line Alignments have developed, the assessment of effect on views has and will continue to be informed by analysis of landform, desk top studies of Ordnance Survey (OS) plans, Google Earth and further field survey to gain an understanding of the potential extents of visibility of the Preferred Line Alignments, identify features which may screen potential views and to identify potential visual receptors.

8.60. Field survey work for the visual assessment will be carried out at the same time as the landscape assessment. No access to properties will be sought and the assessment will therefore be based on the predicted view from publicly accessible locations.

Selection of Viewpoints

8.61. A draft list of viewpoints has been identified and is in the process of being agreed with NRW and PCC as part of the scoping stage stakeholder consultations. The draft list is provided as a schedule in Appendix C and on a plan at Figure 5 (Appendix A). For each viewpoint, record is made of the viewpoint location, general direction and angle of view, optimum viewing distance and reasons for its selection.

8.62. Viewpoints have been deliberately selected to give a sample of:

- *A balance of viewpoints from either side of the Proposed Development;*
- *A proportion close to the Proposed Development (where the overhead line will be in the foreground and middle ground of the view);*
- *A similar proportion further away from the Proposed Development (where the overhead line element of the Proposed Development will be in the middle ground or background of the view);*
- *A proportion looking along the line (where a number of towers or wood poles may be seen 'stacking' behind each other) as well as across to the line where only one tower or wood pole may be visible;*
- *Views from residential areas;*
- *Views from key recreational resources and landscapes of particularly noteworthy visual and/or recreational amenity including landscapes with statutory landscape designations;*

- *Important historic or cultural sites where people are likely to appreciate the wider landscape setting of the site*[11]*;*
- *Cultural landscape associations; and*
- *Locations where cumulative views may be experienced.*

8.63. Locations where a greater number of viewers may be present, such as main roads and edges of settlements have also influenced the selection for viewpoint locations.

8.64. The selection of viewpoints is therefore not a representative sample of all potential visual receptors, but is deliberately biased to be representative of the most sensitive visual receptors – namely residential areas and valued landscapes/ sites/ routes.

Assessing the Sensitivity of Visual Receptors

8.65. In addition to identifying locations from where the Proposed Development will be seen, the viewpoints also identify the different groups of people who will potentially be affected by changes to their view or visual amenity at that particular location. The sensitivity of each visual receptor will then be determined by combining an assessment of their susceptibility to changes in their view with a judgement on the value attached to the particular views to give an overall judgement on the sensitivity of the viewpoint graded on a four point scale of very high, high, medium and low. Where possible an estimate will be made of the relative numbers of people likely to be affected in each case.

8.66. People generally have different susceptibilities to changes in their view depending on the activity they are engaged in and the extent to which their attention may be focused on the view at a particular location. Certain activities or locations may be specifically associated with the enjoyment and appreciation of the landscape, for example footpaths, tourist or scenic routes and views to and from valued landscapes. GLVIA (Paras. 6.33 and 6.34) assesses the susceptibility of groups of people as in Table 8.4 below.

Table 8.4 | Susceptibility of Different Groups of Visual Receptors

Susceptibility	Description
High	Residents in individual properties or settlements. People engaged in outdoor informal recreation whose attention or interest is likely to be focused on the landscape or on particular views. Given the rural nature of the area within which the Proposed Development is located, this will include users of Public Rights of Way. Visitors to historic assets or other attractions where views of the surrounding landscape make an important contribution to the experience. Communities where views contribute to the visual amenity or landscape setting enjoyed by residents in the area. Travellers on scenic routes where awareness of views is likely to be particularly high.
Medium	Travellers on roads, rail or other transport routes tend to fall into a medium category of susceptibility as their attention is less likely to be focussed on the surrounding landscape.
Low	People engaged in outdoor recreation or sport which does not involve or depend upon appreciation of views in the landscape. People at work whose attention is not be focused on their surroundings. People on motorways and other major roads, where views are transient and fleeting.

11 Note that the effects on the historic setting of these sites will be covered in the Historic Environment and Cultural Heritage ES Chapter.

Value Attached to Views

8.67. Different levels of value are attached to the views experienced by different groups of people at different viewpoints. A judgement will therefore be made about the value attached to the view at each viewpoint. GLVIA (para. 6.37) notes that judgements on value should take account of:

- *Recognition of the value attached to a particular view through planning designation or for example in relation to important heritage features; and*
- *The popularity of certain views expressed in guidebooks, tourist maps, provision of facilities for enjoyment (car parks, sign boards, toilets etc.), and references in literature or art.*

8.68. Views which are not to or from any recognised designation and which will would not be experienced by many receptors are typically considered less important.

8.69. The assessment of the value of viewpoints will be classified according to the indicative criteria set out in Table 8.5.

Table 8.5 | Value Attached to Views

Value	Description
High	A view from an internationally/ nationally designated or known viewpoint. The viewpoint is well frequented and/ or promoted as a visitor destination in national sources such as guidebooks or tourist maps/ literature with the view forming a recognised part of the visitor experience. The view relates to the experience of other features, for example important heritage assets or cultural associations.
Medium	A view from a viewpoint which has some importance at the regional or local level and which may be locally designated. The view may be promoted regionally or locally as a visitor destination or be associated with an important and popular visitor or recreational attraction where the view forms a recognised part of the visitor experience. The view may have local cultural associations. The view is likely to represent the view of many people for example the combined community.
Low	A view from a viewpoint which may have value to local people but has no formal planning status, is not associated with important landscape, heritage or visitor attractions and doesn't represent the views of many people. The public are unlikely to visit the viewpoint to experience the available views.

Visibility of Overhead Lines in the Landscape

8.70. The visibility of a 132kV overhead line in the landscape (as this will generally be the element of the Proposed Development that sits the tallest in the landscape and is therefore most visible) depends on a range of factors including:

- *The proximity of wood pole structures/ towers to the viewer;*
- *The design of the wood pole structure/ tower (including height and whether the wood pole structure/ tower is a straight line, angle or terminal pole/ tower);*
- *The number of wood pole structures/ towers visible, proportion of each pole/ tower visible and the screening/ backclothing effects of existing buildings, vegetation and landform;*
- *The degree of sky lining of wood pole structures/ towers;*
- *Whether wood pole structures/ towers are seen individually or are visible in a row ('stacked');*
- *The presence of other similar vertical developments;*

- *The contrast in colour between the wood pole structure/ tower and its background with varied background colours or patterns being most effective in helping the wood pole structure/ tower blend in with its surroundings; and*
- *The degree of 'landscape fit' or how well it is accommodated in the landscape.*

8.71. The principle of intervisibility will be used in the assessment of visibility, whereby locations visible from the Proposed Development would also have views back to the development once constructed. The assessment will be undertaken during the winter when the proposed development will be most visible.

Assessing the Magnitude of Visual Effects

8.72. The magnitude of likely change will be evaluated in terms of its size or scale, geographical extent, duration and reversibility.

Size or Scale

8.73. Judgements about the size or scale of effects on visual receptors should take account of:

- *The presence of wood pole structures/ towers in the view, including the proportion of view which they occupy, their proximity to the viewer, and whether views are full, partial or glimpsed;*
- *The number of wood pole structures/ towers visible, and whether they are seen side-on, 'stacked' against one another, skylined or backclothed;*
- *The degree of contrast or integration of wood pole structures/ towers and the wider visual context in terms of form, scale and mass, line, height, colour and texture; and*
- *The length of time the view will be experienced.*

8.74. The size and scale of an effect will be determined by considering the amount of change experienced by a visual receptor, based on the indicative criteria set out in Table 8.6.

Table 8.6 | Size or Scale of Change – Visual Effects

Size or Scale	Description
Large	The proposed development will dominate and result in a substantial or complete change caused by loss of important features or addition of new ones, to the extent that it will markedly change the composition of the view and the visual amenity it offers. The change/ addition of new features will occupy a significant proportion of the view and contrast strongly with existing features; views of the change will be clear and unencumbered by screening features. The development will occupy the foreground of the view. This category is likely to include wood pole structures/ towers seen at a fairly close distance (less than 2 km).
Medium	The proposed development will result in a noticeable change in the view, but not to such a degree that the existing composition of the view and the visual amenity it offers will fundamentally change. The change/ addition of new features will be subordinate to existing features. The development will occupy the middle ground of the view. This category is likely to include wood pole structures/ towers seen against the skyline at a distance beyond 2 km.

Table 8.6 | Size or Scale of Change – Visual Effects	
Small	The proposed development will result in a perceptible change in the view but overall the composition of the view and the visual amenity it offers will barely change. The change/ addition of new features will affect only a small proportion of the view and will blend in with the existing view. The development will occupy the background of the view of be successfully backclothed against landform or vegetation.
Negligible	The proposed development will be barely visible and will appear as a small feature belonging to a distant landscape or view – approximating the 'no change' situation.

Geographic Extent

8.75. The geographical extent of the visual effects will vary with different viewpoints and will be assessed by fieldwork to make a judgement on the area over which effects are likely to occur. GLVIA (para. 6.40) notes that it is likely to reflect:

- *The angle of view in relation to the main activity of the receptor;*
- *The distance of the view from a proposed development; and*
- *The extent of the area over which the changes would be visible.*

8.76. Based on the above considerations, the magnitude of visual effects will be assessed using the criteria presented in Table 8.7.

Table 8.7 | Geographical Extent of Visual Effects	
Geographical Extent	**Description**
Large	The change in the view will be continuously visible over a wide area or from many locations; will potentially be direct from the receptor and/ or in the foreground, or be visible to many people.
Medium	The change in the view will be visible over a reasonable area; will potentially be intermittent, at an oblique angle and/ or at medium range.
Small	The change in view will only be visible from a few locations; will potentially be at long range and/ or at an oblique angle.
Negligible	The change in view will only be visible at one or two specific locations, will potentially be at long range and/ or at an oblique angle, or be visible to few people.

8.77. The two factors that contribute to the assessment of magnitude of visual effect will then be considered together to derive an overall magnitude of change for each visual receptor, which is determined by use of professional judgement supported by reasoned explanation.

Duration and Reversibility

8.78. The duration of effect will be recorded separately and will not influence the assessment of magnitude. For example it may be possible for construction activities to result in a high magnitude of effect on the landscape albeit that such effects may be temporary.

8.79. In referring to duration of effects the following terminology applies:

- *Short term – zero to five years;*
- *Medium term – five to fifteen years;*
- *Long term – over fifteen years; and*
- *Decommissioning.*

Judging the Overall Significance of Visual Effects

8.80. The significance of visual effects will be assessed through professional judgement by combining the sensitivity of the receptor with the professional judgement as to the magnitude of effect to allow a final judgement to be made about whether an effect is likely to be significant in terms of the EIA Regulations.

8.81. There is no specific definition in any guidance as to what constitutes a significant landscape or visual effect and what weight should be attached to it. GLVIA requires the assessment of significance to be clearly defined and for any judgements to be as transparent as possible. For the Proposed Development the following will apply:

- *Significant effects are more likely to arise from changes affecting people who are particularly sensitive to changes in views, particularly occupiers of residential properties or people living in or visiting particularly tranquil or remote landscapes;*
- *Changes in views affecting people at recognised and popular viewpoints (including designated landscapes) or from recognised scenic or tourist routes are likely to be more significant than changes affecting other, less important viewpoints;*
- *Changes affecting large numbers of people are generally likely to be more significant than those affecting a relatively small group of users; and*
- *Large scale changes, which introduce new or discordant or intrusive features into the view are more likely to be significant than small changes or changes involving features already present within a view.*

8.82. The final overall judgement of the predicted effects on views and visual amenity will be summarised in a series of four categories of significance – major, moderate, minor, negligible. In addition, a final statement summarising the significant effects that are likely to influence the outcome of the decision making process will be provided.

Residential Visual Amenity Effects

8.83. Effects of development on private residential properties are increasingly assessed through 'residential amenity assessments' which also include consideration of other factors such as noise, light and vibration. These are separate from LVIA, although visual effects assessment is often carried out as part of a residential amenity assessment. In recognition that residents are typically particularly susceptible to changes in their views, the likely effects on all individual and groups of properties within 100 m of the edge of the Preferred Line Route Alignments for the section of overhead line supported by wood pole structures and 300 m for the sections supported by steel towers will be assessed using the methodology described for the LVIA above.

Assessment of Cumulative Effects

8.84. The cumulative landscape and visual assessment (CLVIA) will deal with the effects of the Proposed Development interacting with the effects of the Associated Development, together with other proposed developments in the area. This is in recognition that the combined effects of a number of similar developments concentrated in one area may be greater than the sum of the effects from the same developments if considered individually.

8.85. GLVIA (para. 7.3) describes cumulative effects as follows:

- *Cumulative landscape effects are effects on the physical fabric or character of the landscape or any special values attached to it;*
- *Cumulative visual effects are caused by the combined visibility of two or more developments from one viewpoint. This can occur either in combination (where several developments are in the same field of view) or in succession (where the observer has to turn to see the different developments); and*
- *Cumulative visual effects can also be sequential. These occur when the observer is moving through the landscape and are typically assessed from roads, footpaths etc. Sequential effects may be frequently sequential (features or developments appear regularly and with short time lapses between) to occasionally sequential (long time lapses between appearances), depending on factors such as the speed of travel and the distances between viewpoints.*

8.86. The degree of cumulative landscape or visual effect is related to the number and distance between individual proposed developments, their intervisibility, the character of the landscape and its sensitivity to particular types of proposed development and the siting and design of each proposed development. In addition to cumulative physical effects, cumulative effects on the landscape or visual amenity may have a bearing on the perception and enjoyment of landscape by, for example, conflicting with attributes such as tranquillity or remoteness.

Development Scenarios for Cumulative Assessment

8.87. Three cumulative development scenarios will be assessed:

- *The Proposed Development + Associated Development (Neuadd Goch Bank Wind Farm, OHL and substation);*
- *The Proposed Development + Associated Development + Related Development (the eight contracted wind farms and NG substation/ 400kV grid connection); and*
- *The Proposed Development + Associated Development + Related Development; + any other relevant developments including the Llandinam 132kV OHL, other wind farms and single/ double turbines.*

Approach to Assessing Cumulative Landscape and Visual Effects

8.88. The process and procedures for identifying and judging cumulative landscape and visual effects is essentially the same as for the LVIA described above, in that the degree of effect is determined by combining an evaluation of the sensitivity of the landscape or visual receptor and the magnitude of change. The emphasis of the assessment will always be on the main development being considered and whether it will combine with other developments to increase the degree of landscape or visual effect identified in the LVIA.

8.89. Similarly the assessment of the Associated Development, although subject to a separate environmental report, will follow the same process as for the Proposed Development and will accord with the guidelines set out in GLVIA.

Defining the Study Area for the CLVIA

8.90. The initial task in defining a study area will be to identify all the major proposals (most of which will be wind farms or small scale wind energy developments applications), which could potentially interact with the Proposed Development to cause additional landscape and visual effects. The assessment will focus on those proposed projects which will potentially give rise to significant effects when seen alongside the Proposed Development.

8.91. To do this it will be necessary to identify the distance within which significant effects will be likely to occur for each type of development. This is because the distance between the Proposed Development and any projects to be included in the CLVIA will affect the magnitude of the cumulative effects which may occur and therefore judgements about their significance. This is explained further below by reference to zones of visual influence – areas where significant landscape and visual effects will be most likely to occur.

Zone of Influence for the Proposed Development

8.92. For the purpose of the CLVIA, the zone of visual influence for the Proposed Development is considered to be 3 km. As explained in the preceding LVIA, the tallest part of the proposed development is the 26 m high steel towers and whilst these may be visible at distances up to 10 km, they will appear as a minor element in the landscape, and are unlikely to give rise to significant effects.

Zone of Visual Influence for Wind Energy Developments (including Related Development)

8.93. The CLVIA assessment for the Beauly Denny 400kV Transmission Line in Scotland, adopted the following guidance from Scottish Planning Advice Note 45 (PAN 45) (Ref. 8-22) to help judge the visual prominence of wind farms in the landscape and thus the likelihood of them generating significant cumulative landscape and visual effects:

"Figure 8 in PAN 45 provides guidance on the perceptibility of wind farms at various distances from the viewer. It states that when they are up to 2 km away they are likely to be a prominent feature. When between 2 and 5 km they are relatively prominent. Between 5 and 15 km away they are only prominent in clear visibility and are seen as part of the wider landscape. At 15 to 30 km away they are only seen in very clear visibility and are a minor element in the landscape. Arguably therefore, significant (major or moderate) cumulative visual effects are most likely to occur when the wind farm(s) in question are within 2 km of the proposed overhead line, given the very different characteristics of the developments." (para. 25.1.1.12)

"Major adverse cumulative effects are anticipated in areas where two or more wind farms are visible at the same time and in the same field of view as the proposed overhead line, and are within 2 km of the viewer ….. Moderate adverse cumulative effects are anticipated in areas where the proposed line would be visible in the same field of view as a wind farm located within 2 km of the viewer. Moderate adverse cumulative effects would also be anticipated in areas where there would be views of more than one wind farm, in the same field of view as the proposed line, within 2 km to 5 km distance, or where wind farms may be visible in different directions from the same viewpoint. More distant views of wind farm developments would be expected to result in no greater than minor adverse cumulative visual effects." (para. 25.3.2.20)

8.94. Although PAN 45 has now been revoked (and replaced by on-line guidance which makes no reference to the distances within which likely significant effects may occur), in the absence of similar guidance it is considered useful for the CLVIA for the purposes of the assessment.

8.95. Because there may be situations where there may be views of more than one wind farm in the same field of view as the Proposed Development, the proposed wind farms most likely to give rise to significant cumulative effects and therefore taken forward for assessment will be those within 5 km. Based on the Beauly Denny approach, these can be categorised as follows:

- *The proposed wind farms which would be most likely to contribute to significant cumulative landscape and visual effects lie within 2 km of the Proposed Development. These are Dyfnant Forest, Mynydd Lluest y Graig, Llanbrynmair, Carnedd Wen, Carno III, Llaithddu, Llanbadarn Fynydd, Neuadd Goch Bank (operational wind farms within 2 km include Tirgwynt, Carno A & B (i & ii) and Llandinam - as such, these developments form part of the existing baseline). Esgair Cwmowen is pending determination of a TCPA application and will be included within the cumulative assessment. These developments may appear prominent in views;*
- *The proposed wind farms which would be less likely to contribute to significant cumulative landscape and visual effects lie between 2 and 5 km of the Proposed Development. These include Bryngydfa (2.5 km) which is awaiting determination of a TCPA application. These developments will be less noticable in views; and*
- *The proposed wind farms which lie beyond 5 km and are therefore unlikely to give rise to significant effects when seen together with the Proposed Development are Mynydd y Gwynt (12 km) which is awaiting determination of a TCPA application and Bryn Titli extension (8 km) which is at the pre-application scoping stage and Nant y Moch (18 km) which is at the pre-application scoping stage.*

Zone of Influence for Other Developments

8.96. The zone of influence for other developments varies depending on the type of development being proposed and will be determined and agreed with stakeholders once they have been identified.

8.97. For single/double wind turbines (up to 50 m high) experience indicates that significant effects are most likely to be experienced within a distance of 2 km. At this distance a 50 m high structure has an apparent height of approximately 25 mm which substantially lessens its visibility.

The Study Area for the CLVIA

8.98. Once the individual projects have been identified and their zones of influence identified, a Cumulative Zone of Theoretical Visibility (CZTV) will be generated to identify the areas over which a number of proposed developments are likely to be seen. Theoretically, areas where the ZTVs for the individual developments overlap and which lie within the zone of influence for the relevant development will be the areas where significant cumulative landscape and visual effects will be most likely to occur.

8.99. A broad study area for the CLVIA will then be defined and an inventory prepared of all the projects included within the cumulative landscape and visual assessment using information from that which is publicly available at the time of the assessment or which can be obtained from the relevant developer. The assessment will be based upon an analysis of their published ESs. Where information is lacking or unavailable and there is uncertainty about what was being proposed, the assessment will be more speculative. In these instances professional judgement will be applied to assess whether the scheme is likely to be visible and if so whether it would be likely to contribute to significant cumulative landscape and visual effects. In relation to the assessment of the Associated Development, however, the effects of the Associated Development will first be summarised, in order to allow for an assessment of the cumulative effects of this together with the Proposed Development to be carried out.

Assessment of Landscape Effects in Cumulative Development Scenarios

8.100. The assessment of cumulative landscape effects is concerned with the combined effects of the Proposed Development in conjunction with other proposed developments. These effects may result from changes in the character of the landscape arising from the removal or damage to features, elements or characteristics of the baseline landscape or through the introduction of new man-made structures elements or from the removal of or damage to existing ones. Such changes may develop incrementally over time and be perceived gradually.

8.101. The identification and assessment of the significance of cumulative landscape effects will follow the same approach as that taken in the LVIA. The emphasis of the assessment will always be on the Proposed Development and whether it will combine with the other developments being considered to increase the degree of landscape effect identified in the LVIA.

8.102. The cumulative landscape assessment will consider potential effects upon designated landscapes. This will then be followed by an assessment of cumulative effects upon the different landscapes affected by the Proposed Development based on the local character areas defined by the Field Based Landscape and Visual Sensitivity Appraisal.

8.103. In making judgements the assessment will consider:

- *The susceptibility of the landscape to the proposed overhead line (as recorded in the LVIA);*
- *The value attached to the landscape, reflecting its designation status and other valued components of the landscape (as recorded in the LVIA); and*
- *The nature or magnitude of effects, both in terms of size and geographical area. This will differ from the magnitude of effects identified for the LVIA.*

8.104. The significance of identified cumulative landscape effects will then be assessed through the application of professional judgement.

8.105. As noted in the LVIA, significance is not absolute and can only be defined in relation to each development and its location. GLVIA notes that there are no hard and fast rules but generally:

- *"Major loss or irreversible negative effects over an extensive area, on elements and/or aesthetic and perceptual aspects that are key to the character of nationally valued landscapes are likely to be of the greatest significance;*
- *Reversible negative effects of short duration, over a restricted area, on elements and/or aesthetic and perceptual aspects that contribute to but are not key characteristics of the character of landscapes of community value are likely to be of least significance and may, depending on the circumstances, be judged as not significant; and*
- *Where assessment of significance place landscape effects between these extremes, judgements must be made about whether or not they are significant, with full explanations of why these conclusions have been reached." (para.5.56)*

8.106. GLVIA also notes that:

"the most significant cumulative landscape effects are likely to be those that would give rise to changes in the landscape character of the study area of such an extent as to have major effects on its key characteristics and even, in some cases, to transform it into a different landscape type. This may be the case where the project itself tips the balance through its additional effects. The emphasis must always remain on the main project being assessed and how or whether it adds to or combines with the others being considered to create a significant cumulative effect." (para.7.28).

8.107. The final overall judgement of the predicted effects on views and visual amenity will be summarised in a series of four categories of effect – major, moderate, minor or negligible. A final summary of significant effects will be provided.

8.108. Cumulative landscape effects assessed as major or moderate are considered significant. Other effects are considered not significant.

Assessment of Visual Effects in Cumulative Development Scenarios

8.109. The assessment of cumulative visual effects is concerned with the identification and assessment of the additional effects on peoples' views and general outlook resulting from the effects of the Proposed Development when seen together with the other projects being considered in the cumulative assessment. These effects may result from changes in the character and content of the views experienced in particular places arising from the removal or damage to features, elements or characteristics of the baseline landscape or through the introduction of new elements, man-made structures or removal of or damage to existing ones. As with cumulative landscape effects, such changes may develop incrementally over time and be perceived gradually.

8.110. The identification and assessment of the significance of cumulative visual effects will follow the same approach as that taken in the LVIA. The emphasis of the assessment will be on the Proposed Development and whether it will combine with the other developments being considered to increase the degree of visual effect identified in the LVIA.

8.111. The cumulative visual assessment will be based on the viewpoints and visual receptors identified in the LVIA and which lie within the CZTV. These will be agreed with NRW and PCC prior to commencement of the assessment.

8.112. The cumulative visual assessment will initially consider potential effects on views to and from designated landscapes. This will then be followed by an assessment of cumulative visual effects based on selected viewpoints. Finally there will be an assessment of the way in which any sequential views of multiple developments may be experienced from roads and important routes identified in the LVIA. For each viewpoint, the nature of the existing view and the predicted view with the other developments being considered will be combined. The aim will be to understand and describe the overall cumulative visual effects and identify the contribution that the Proposed Development makes to those effects.

8.113. The visual receptors will have been categorised in terms of their susceptibility and importance to the Proposed Development as part of the preceding LVIA and are unlikely to change although this will be checked. The magnitude of visual effects, however, will potentially alter through the addition of other developments and judgements will be made about this.

8.114. As noted in the LVIA, the significance of the effects of development on views is related to the sensitivity of the receptor, the characteristics of the development being proposed and the nature or magnitude of the change likely to be experienced.

8.115. GLVIA (para. 7.38) notes that typically higher levels of significance are considered to arise from:

- *Developments that are in close proximity to the Proposed Development and are clearly visible together in views from the selected viewpoints; and*
- *Developments that are highly inter-visible with overlapping ZTVs – even though the individual developments may be at some distance from the Proposed Development, the overall combined cumulative effect at a particular viewpoint may be significant.*

8.116. The final overall judgement of the predicted effects on views and visual amenity will be summarised in a series of four categories of significance – major, moderate, minor or negligible. A final summary of significant effects will be provided.

8.117. Cumulative visual effects assessed as major or moderate will be considered significant. Other effects are considered not significant.

Techniques for Undertaking and Presenting Landscape and Visual Analysis

Selection of Viewpoints

8.118. Viewpoints will be used to help assess the existing visual characteristics of the study area, assess the sensitivity of the visual receptors to the Proposed Development, illustrate the effectiveness of mitigation measures and to illustrate the predicted appearance of the Proposed Development in the view. They will also be used to illustrate cumulative effects arising from the Proposed Development when seen in conjunction with other proposed developments.

8.119. In accordance with GLVIA (para. 6.19) we will identify three types of viewpoint:

- *Representative viewpoints – selected to illustrate a greater number of viewpoints that cannot all be included individually. For example one house may be taken to be representative of the views from a number of houses in a settlement and certain points may be chosen to represent views from a cluster of public footpaths and bridleways;*
- *Specific viewpoints – chosen because they represent key views and sometimes promoted viewpoints within the landscape, including local visitor attractions, viewpoints in areas of particularly noteworthy visual and/ or recreational amenity such as landscapes with statutory landscape or landscape related designations, or viewpoints with particular cultural landscape associations; and*
- *Illustrative viewpoints - chosen to demonstrate a particular issue or effect, for example reduced perceptibility beyond a certain distance.*

8.120. Whilst a high number of viewpoints will be initially identified we anticipate that these will be reduced down to those that are required in order to represent potential significant effects on views and viewers. Ongoing discussions with stakeholders have already identified broad areas of particular landscape and visual sensitivity, but further consultations will help identify and agree the viewpoints for the assessment, including those for wireframe and photomontage generation.

8.121. Each viewpoint will be presented as a figure with a photograph and a wireline diagram (see below) at the same scale and orientation as the photograph. Supporting text will provide technical information about the photography used, including camera details, date and time of photography and weather conditions and descriptive information such as:

- *The location, nature and characteristics of the chosen representative and specific viewpoints;*
- *The reason for its selection;*

- *Nature, composition and characteristics of the existing views experienced at the viewpoints; and*
- *Elements, such as landform, building or vegetation which may interrupt, filter or otherwise influence the views.*

Photographs and Visualisations

8.122. Photographs and visualisations will be used in the ES to communicate information about the baseline landscape and the visual effects of the Proposed Development:

- *The location from which the photographs are taken will be carefully chosen and justified;*
- *Prevailing weather conditions and atmospheric effects will be described using consistent Met Office terminology, noting any effects of the conditions on the photographs;*
- *Seasonal effects on the photographs and the landscape they are illustrating will be noted; and*
- *Technical aspects of the photography, including lens type and focal length will be recorded.*

Wirelines and Photomontages

8.123. Wirelines are computer generated line drawings based on a Digital Terrain Model (DTM) that illustrates the 3D shape of the landscape and any features within it. As noted in the SNH guidance, they are a valuable tool in LVIA because they allow the assessor to compare the position and scale of a proposed development within the wireline to the existing view of the landscape. Wirelines portray objective data, which means that the assessor can make clear and transparent judgements on the likely visual effects of a proposed development, whereas photomontages are more vulnerable to manipulation and misinterpretation. Wirelines can also reveal what would be visible if an existing screening element for example, buildings or trees were removed.

8.124. Wirelines will be generated using proprietary software using a simplified but accurately dimensioned 3D wireline model of each type of above ground infrastructure. Sufficient DTM data will be used to enable the full landform background to the overhead line to be seen and thus easily matched to a photograph or view on site.

8.125. A selection of viewpoints will also be provided as photomontages or a photorealistic simulation of the view before and after the construction/operation of the Proposed Development. Photomontages can help to illustrate to a wider audience, the assessment process by which judgements are made. Photomontages will be selected following production of wirelines and prepared in consultation with NRW and PCC using the most up to date guidance. We will aim to make these photomontages both accessible and comprehensible to a non-specialist audience.

8.126. The following is a list of the most up-to-date guidance most of which had been produced for wind farms:

- *Scottish Natural Heritage (2006) 'Visual Representation of Windfarms - Good Practice Guidance', 2006 (Ref. 8-16);*
- *The Landscape Institute (2011) 'Photography and Photomontage in Landscape and Visual Impact Assessment (advice note 01/11)' (Ref. 8-6);*
- *The Highland Council 'Visualisation Standards for Wind Energy Developments', 2010* (Ref. 8-19);
- *The Highland Council (2013) 'Visualisation Standards for Wind Energy Developments',* (Ref. 8-19); *and*
- *Scottish Natural Heritage (2013) 'Visual Representation of Wind Farms - Consultation Draft', (Ref. 8-17).*

8.127. There is much ongoing debate about which of this guidance provides the most realistic image representation of scale and distance and the guidance may change during preparation of the EIA. As agreed (April 2014) with NRW and PCC however, we intend to take and present photographs with a 50 mm lens and 90° angle of view (400 mm viewing distance). If requested by stakeholders, for sensitive viewpoints beyond 1 km from the Proposed Development, we will provide an additional image presented at 70 mm focusing on the nearest part of the Proposed Development to the viewpoint.

Baseline Conditions

8.128. This will comprise a description and appraisal of the existing (as in 2014) landscape and visual conditions of the study area (as defined earlier in this section). It is the baseline against which the landscape and visual changes arising from the Proposed Development will be described and assessed. For the purposes of the LVIA it will include the consented Tirgwynt Wind Farm, which is currently under construction.

Baseline Studies Undertaken to Date

8.129. A large quantity of baseline data has already been acquired through desk study and field surveys, which have been undertaken as part of the route selection process since September 2009. This work is detailed in a series of documents produced by SP Manweb and listed in Table 1.2 (Chapter 1 of this Scoping Report). Baseline studies undertaken to date have included the following:

- *Identification of local landscape character for a number of route corridor options, including verification of published assessments and LANDMAP data;*
- *Desk based assessment of landscape sensitivity to a 132kV overhead line across the wider study area;*
- *Field based assessment of landscape and visual sensitivity to a 132kV overhead line, along each of the route corridor options; and*
- *Field based visibility overview of the various route corridor options and their surroundings, including identification of key visual receptors.*

8.130. The assessment will be informed by the findings of the work undertaken to date, supplemented by professional understanding, consideration of stakeholders knowledge of the area and further field surveys. The purpose of this additional work is to gain a more detailed understanding of the character, condition and sensitivity of the landscape as a baseline against which possible landscape and visual effects will be assessed. The additional desk-based and field-work will include:

- *A review of relevant local planning policy and an inventory of designated and valued landscapes;*
- *A description of the landscape character along each of the Preferred Line Route Alignments based on the Powys Landscape Character Assessment (Ref. 8-12) and LANDMAP aspect data;*
- *A description of the pressures for change being exerted on the landscape;*
- *An updated field based assessment of the landscape and visual sensitivity of the landscape to 132kV overhead lines. This will be based on criteria relating to landscape susceptibility and value as discussed in scoping stage consultations with NRW and PCC. The width of the corridor to be assessed will depend on the landform and other characteristics of the local landscape;*
- *A description of the general visual context of the study area, including an understanding of the areas from which the Proposed Development may be visible: the different groups of people (visual receptors) who may be affected, including an estimate of their relative numbers; the places that will be affected; and the nature of the views and visual amenity currently experienced at those locations. Aspects of particular importance in this respect will be views from settlements, historic landscapes and features, key routes, tourist/ visitor attractions and promoted viewpoints; and*
- *Further review of indicative viewpoints and viewpoint sensitivity in conjunction with NRW and PCC.*

8.131. The wider landscape context for the Proposed Development is shown in Figure 2 (Appendix A) and the constraints relevant to the landscape and visual effects section are shown in Figure 4C (Appendix A) of this EIA Scoping Report. The wider landscape incorporates parts of the Carno, Trannon and Severn valleys. These valleys flow broadly west to east through an area of undulating pastoral farmland with open moorland to the north and south.

Description of the Preferred Line Route Alignments

8.132. A description of the Preferred Line Route Alignments in the context of the surrounding is provided in Chapter 2 of this EIA Scoping Report.

Overview of the Existing Landscape

8.133. The Proposed Development is located in Mid Wales. To the west lie the moors which form the eastern edge of the Cambrian Mountains. These merge eastwards into rolling farmlands interspersed with broad low lying valleys. In places the landform is complex - the many small valleys and landscape variety imparting a high scenic quality. In the southern half of the Mid Wales area, another area of higher ground rises south of the Severn valley. The rolling Shropshire Hills are located to the east and are designated as AONB because of their high scenic quality.

8.134. Land use is mainly rural, with a mix of pastoral and small scale arable farming in lower-lying areas. On higher ground, rough grassland and heather moorland predominates. There are also some relatively large areas of commercial forestry such as Dyfnant Forest.

Settlements and Transport

8.135. Settlements in the area include small villages, hamlets and dispersed individual properties with the large settlement of Newtown 7 km to the north east of the CC Preferred Route Line Alignment. Settlement is denser in the valleys, becoming sparser in the uplands to the south and west.

8.136. The regional transport network principally comprises the A483, A470, A489 and A458 and the Cambrian rail line from Newtown to Machynlleth. A dense network of B roads, minor roads, lanes and tracks supplements the transport network at a local level.

Designated Landscapes

8.137. Designated landscape features include Snowdonia National Park which is located to the north-west, approximately 9 km away from the BNC Preferred Line Route Alignment. The Shropshire Hills (AONB) lies approximately 6 km to the east of the CC Preferred Line Route Alignments.

Other Designated & Undesignated Features (which have a Landscape Aspect)

8.138. Other features both designated and undesignated add to the character and value of the landscape or are evidence that the landscape is valued for recreational activity where experience of the landscape is important. They include: Open Access Areas identified under the Countryside and Rights of Way Act (CRoW); the Caersws Basin and Clywedog Valley Registered Historic Landscapes; Plas Dinam, Gregynog and Abbey Cwmhir Registered Parks and Gardens; some ancient sites which are Scheduled Ancient Monuments; national trails such as Glyndwr's Way and Sustrans National Cycle Route 81; and regionally promoted trails such as the Kerry Ridgeway and Severn Way.

Locally Valued Landscapes

8.139. Locally valued landscapes include important views (e.g. Garreg Hir and Nant y Eira); landscapes experienced from key tourist and recreation routes (e.g. Blaen y Cwm from the A470 north of Clatter); landscapes valued for their cultural associations or distinctiveness (e.g. Trefeglwys and the Afon Trannon valley); and any other notable landscape features such as veteran trees and ancient woodlands.

Landscape Character (including pressures for change)

8.140. The Preferred Line Route Alignments pass through a number of landscapes displaying differing landscape characteristics, ranging from the exposed uplands where the line routes converge near Cefn Coch to low lying floodplains such as the Afon Trannon valley.

8.141. The Proposed Development lies within five of NRW's regional landscape character areas identified in the Draft Landscape Character Map for Wales.

8.142. The BNC Preferred Line Route Alignments originate in *Y Berwyn* (Area 16) before entering the undulating landscape of the *Montgomeryshire Hills and Vales* (Area 17) and heading south towards Haelfron. The remaining sections of BNC, including the BNC3/ BNC4/ BNC5 fall within the *Cambrian Mountains* (Area 21) and terminate at Cefn Coch.

8.143. The entire BSC Preferred Line Route Alignment lies within the *Cambrian Mountains* (Area 21) extending from the uplands in Carno, through the Cwm Llwyd valley before terminating on the high ground near Cefn Coch.

8.144. The southern end of the CC Preferred Line Route Alignment, from Neuadd Goch towards Llanidloes, falls within the *Radnorshire Hills* (Area 20). The CC Preferred Line Alignment then runs north through the *Severn Valley* (Area 19) towards Trefeglwys before entering the *Cambrian Mountains* (Area 21) and terminating in the high land at Cefn Coch.

8.145. Pressures for change being exerted on the landscape of the area are primarily for wind farm development in and around TAN 8 SSA B. A number of wind farms have either been consented or are in the planning system.

Landscape Sensitivity

8.146. An initial desk based landscape sensitivity appraisal was undertaken at an early stage in the development of the scheme and a copy included in SP Manweb's Routeing Methodology and Route Corridors Phase One Report published in March 2011. This suggested that much of the study area being assessed at the time was of low to medium sensitivity to overhead line development.

8.147. A field based sensitivity assessment based on an area's sensitivity to overhead lines was also undertaken with sections of the pre-scoping route corridors identified within a range of low, medium-low, medium, medium-high and high sensitivity. Generally, the upland areas around and to the west of Cefn Coch contain the majority of areas recorded as having low and medium-low sensitivity with areas of medium and high sensitivity extending out from this area along the main valleys. Areas considered to have higher sensitivity to overhead lines were recorded in parts of the Trannon valley east of Trefeglwys and south east of Llanidloes. The only area recorded as having high sensitivity was the Kerry Ridgeway. Part of the assessment involved a visual assessment along the pre-scoping route corridors. This identified that there may be potential views of overhead lines on the skyline from the Cledan valley, Carno valley and around Blaen-y-cwm. The detailed findings of the field surveys are presented within the appraisal tables in SP Manweb's Line Routeing Methodology and Appraisal – Phase 3 Report published in September 2013.

8.148. The appraisal will be revisited and refined during the development of the technology choice and Preferred Line Alignments. Its output will be used to inform the assessment and the identification of mitigation measures.

Visual Amenity and Potential Visual Receptors

8.149. The study area includes a mixture of towns, villages, hamlets and individual properties as well as transport routes, tourist, leisure and recreational facilities.

8.150. Based on the visibility work undertaken to date, including ongoing discussion with stakeholders, the following are some of the visual receptors likely to be affected by the Proposed Development. This list is not exhaustive and will be refined and where necessary expanded throughout the design of the Proposed Development and in response to the input from stakeholder workshops.

- *In addition to the smaller villages, hamlets and individual residential properties dispersed throughout the area, larger villages that could experience adverse visual effects include Llangadfan, Carno, Clatter and Trefeglwys;*
- *The Proposed Development could affect transient views from sections of the road and rail network, including the A470 tourist route along the Carno valley.*
- *The Proposed Development could affect views from Glyndwr's Way National Trail, National Cycle Route 81, the Kerry Ridgeway Regional Trail and the Severn Way Regional Trails. Views from Open Access Areas and Registered Common Land may also be affected; and*
- *The Proposed Development could affect views from other recreational receptors, including the Mid Wales Shooting Centre at Ffinnant.*

Aspects of Development Likely to Cause Significant Effects

8.151. This section will describe the aspects of the Proposed Development that could give rise to significant landscape and visual effects during the different stages of its life cycle. It will also include a description of the mitigation measures that have been incorporated into the development of the Proposed Development thus far with the aim of avoiding, reducing and offsetting (or compensating) for significant adverse landscape and visual effects.

8.152. Potential landscape and visual effects during the construction phase may include:

- *Effects of tree felling and hedgerow removal required as a result of the Proposed Development. The combined landscape and visual effects of the removal of woodland along a number of routes may be significant;*
- *Construction effects caused by undergrounding or diverting any lower voltage overhead lines;*
- *Temporary construction effects relating to the location and nature of access arrangements and on-site construction areas; and*
- *Cumulative effects of constructing a number of connections; particularly with respect to other overhead lines, the wind farms, transmission masts and small scale wind energy developments.*

8.153. For the operational stage likely effects may include:

- *Effects of the Proposed Development on the landscape and on views. Linear developments such as overhead lines raise particular concerns about the totality of disturbance and change resulting from the proposals on the combinations of landscape elements and features that underpin landscape character and sense of place and the character and experience of the local landscape, for example perceptions of remoteness;*
- *Effects of undergrounding or diverting any lower voltage overhead lines;*
- *Effects of mitigation measures, particularly new planting; and*
- *Cumulative effects of the Proposed Development, particularly with respect to other overhead lines, the wind farms, transmission masts and small scale wind energy developments.*

8.154. The decommissioning stage may also give rise to landscape and visual effects arising from the dismantling of the Proposed Development and other above ground infrastructure, ground reinstatement and the movement of materials and plant around the site, including temporary access arrangements.

8.155. The information provided in the ES will cross-reference back to the description of the Proposed Development set out in the introductory chapters and will focus on features and aspects relevant to the assessment of landscape and visual effects.

Potential for Mitigation

8.156. In accordance with the EIA Regulations (Ref 1-6), where there is scope for carrying out works which will help prevent, reduce or where possible offset any significant adverse landscape or visual effects arising from the Proposed Development, these will be considered. In practice, such mitigation measures are typically considered to fall into three categories:

- *Primary or 'embedded' mitigation measures, which have been developed through the iterative design process and have become integrated mainstream components of the Proposed Development's design;*
- *Standard construction practices for avoiding and minimising environmental effects; and*
- *Secondary mitigation measures, which are designed to address any significant adverse landscape and visual effects remaining after primary measures and standard construction practices, have been incorporated into the scheme. These are usually identified once the assessment has been completed. The residual effects are those effects which will potentially remain even with the mitigation measures in place.*

Primary or Embedded Mitigation Measures

8.157. The primary mitigation measures and the construction practices are an integral part of the overall design strategy of any development, not just 'add-on' measures to ameliorate significant environmental effects. In terms of the Proposed Development, beginning with the selection of wood pole structures rather than steel towers for much of the route, SP Manweb has attempted to adopt a positive and pro-active approach whereby mitigation has been assessed and considered at all stages of the routeing process.

8.158. Sensitive routeing in accordance with the Holford Rules (Ref. 8-18) is an important and effective source of mitigation for the Proposed Development. In developing the Preferred Line Route Alignments, SP Manweb's intention has been to ensure that the Proposed Development takes account of environmental considerations and opportunities and achieves the optimum 'landscape fit' as part of an environmentally integrated design. In addition to avoiding specific landscape constraints, the Proposed Development has been developed to reduce likely significant effects where avoidance has not been possible. Such measures typically include minimising the need to remove areas of established broadleaved woodland and optimising the opportunities for backclothing to help reduce the perceptibility of the Proposed Development, particularly the wood pole structures/ steel towers. A high degree of landscape and visual embedded mitigation will therefore be in place at the time of the assessment.

8.159. During the ongoing design process, opportunities for mitigation through sensitive alignment and careful siting and design of towers and wood poles will continue to be explored. The intention is to maximise use of screening landform and vegetation and where relevant identify any opportunities for new planting to help lessen any identified significant effects.

Standard Construction Practices

8.160. These include measures such as vegetation protection around working areas in accordance with B5837 Trees in Relation to Construction (2012) (Ref. 8-23).

Secondary Mitigation Measures

8.161. Secondary mitigation measures are those that are considered following assessment of landscape and visual effects of the Proposed Development as the means of addressing effects identified during the EIA process as likely to be significant. The ongoing EIA is an iterative process and effects may be identified where specific mitigation is considered necessary. Any secondary mitigation measures will be clearly identified in the ES and the residual effects, taking into account this mitigation, will be assessed and clearly set out. Such measures typically include planting proposals in response to identified significant visual effects. SP Manweb will replace the trees lost on a two for one basis.

8.162. Residual effects are those effects which will potentially remain even with the secondary and other mitigation measures in place.

Environmental Enhancement

8.163. Opportunities for mitigation through sensitive route alignment and careful micro-siting and design of wood pole structures/ towers will continue to be explored throughout the EIA process to ensure the effects of the Proposed Development are further reduced. A series of additional measures which are aimed at enhancing the wider landscape will be identified and agreed with the relevant landowners and stakeholders including the local community. These may lie outside the Preferred Line Route Alignments or may not be identifiable at the time of application but may include the following measures:

8.164. Where a more generalised effect on the quality of the landscape is likely to cause significant effects, a programme of hedgerow reinforcement or tree planting may be offered to strengthen the quality of the existing landscape; and

8.165. Where landscape and visual effects arise from the creation of a wirescape due to the presence of an existing low voltage line, consideration will be given to undergrounding the existing low voltage lines.

Summary and Conclusions

8.166. This Chapter of the EIA Scoping Report summarises the baseline conditions as well as detailing the extent of the work anticipated to be required to complete the Landscape, Visual and Residential Visual Amenity Assessment for the Proposed Development in line with the relevant guidelines.

9.0 HISTORIC ENVIRONMENT AND CULTURAL HERITAGE

Introduction

9.1. A full and detailed historic environment and cultural heritage assessment (CHA) for the Proposed Development will be undertaken and provided as part of the ES. In accordance with EIA Regulations (Ref 1-6), this will identify the potential for any likely significant effects which may arise during the construction, operation and decommissioning of the Proposed Development. Undertaken separately, but in conjunction with the CHA and integrated with it in terms of consultations, methodology, assessment and mitigation recommendations, distinct Assessment of the Impact of the Development on the Historic Landscape (ASIDOHL) 2 studies may be produced. Separate ASIDOHL2 studies may be required to assess the potential visual impacts on individual Character Areas - it is these Character Areas that comprise the Historic Landscapes. For example, the Caersws Basin Historic Landscape (HL No. 56) comprises nine Character Areas, so there is a potential requirement for up to nine separate ASIDOHL2 studies.

9.2. The primary objective of the CHA and the possible ASIDOHL2 studies will be to assess the potential for effects on the historic environment resource by means of detailed desk top investigations and field surveys. This will help inform future decision making, design solutions and potential mitigation strategies. The work will include a comprehensive assessment of the regional context within which the archaeological evidence rests and will aim to highlight any relevant research issues within national and regional research frameworks. The CHA will provide information of sufficient detail to allow informed planning decisions to be made that can safeguard the archaeological resource.

9.3. The assessment of historic environment and cultural heritage effects will be undertaken by Archaeology Wales Limited (AW). AW is a Registered Organisation with the Institute for Archaeologists (IfA). All work undertaken will conform to the Standard and Guidance of the IfA (IfA 2008, revised 2011 & 2013) (Ref. 9-1). The Senior Manager in charge of the work will be a Member of the IfA (MIfA).

Guidance and Data Sources

9.4. The CHA will be carried out in accordance with Design Manual for Roads and Bridges (DMRB) (Volume 11 Environmental Assessment, Section 3 Environmental Topics, Part 2, Cultural Heritage) (Ref. 9-2), which is published by the UK Government on behalf of the Highways Agency, Transport Scotland, Welsh Assembly Government (Llywodraeth Cynulliad Cymru) and the Department For Regional Development Northern Ireland. DMRB is the established good practice guidance for assessing the impact of the effects of the Proposed Development on the cultural heritage resource, which it divides into three sub-topics: Archaeological Remains, Historic Buildings and Historic Landscapes, all of which are relevant to the Proposed Development.

9.5. Chapter 2 of the DMRB defines cultural heritage, the regulatory and policy background, and draws out the relationships between cultural heritage and other topic areas. Chapter 3 outlines the overall assessment process. Chapter 4 describes sources of potential impacts, the development of design objectives and mitigation strategies. Chapter 5 describes the framework for Scoping, Simple and Detailed Assessments. The requirements for reporting are set out in Chapter 6.

9.6. The ASIDOHL2 studies, if required, will be carried out in accordance with the published guidance of Cadw (the Welsh Government Historic Environment Service) and Countryside Council for Wales (now NRW) 'Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Processes' (2007, 2nd edition) (Ref. 9-3).

9.7. In addition to the DMRB, ASIDOHL2 and Cadw guidance, the following guidance and sources of information will be taken into account:

9.8. Countryside Council for Wales (2010). 'Landscape Character Map for Wales' (Ref. 8-5).

9.9. Natural Resources Wales. LANDMAP (Ref. 8-7);

- *Welsh Assembly Government (2009). 'One Wales', 2007 - This recognises the geographical, social, linguistic and cultural diversity of Wales, which is manifested in the historic environment. It makes reference to the need to draw upon Wales' unique culture and history in the promotion of Wales and recognises the role that this can play in creating a prosperous society (Ref. 6-12);*
- *Powys County Council (2008). 'Powys Landscape Character Assessment' (2008) (Ref. 8-12);*
- *Planning (Listed Buildings and Conservation Areas) Act, 1990 (Ref. 9-4);*
- *Planning (Listed Buildings and Conservation Areas) (Amendment) (Wales) Regulations, 2009 - Makes provision for design and access statements which are required to accompany applications for listed building consent (Ref. 9-5);*
- *Welsh Government (2014) 'Planning Policy Wales' (Edition 6) (Ref. 6-5);*
- *Register of Landscapes of Special Historic Interest in Wales, Parts 1 & 2, (2001). (Cadw, CCW, ICOMOS(UK)) - The Register highlights what are considered to be the best examples of different types of historic landscape in Wales (Ref. 9-6);*
- *Register of Parks and Gardens of Special Historic Interest in Wales (2002). (Cadw, CCW, ICOMOS (UK)) - The Register includes landscapes, parks and gardens considered to be of national importance (Ref. 9-7);*
- *Welsh Assembly Government (2005). 'Technical Advice Note (TAN) 8: Planning for Renewable Energy' (Ref. 1-3);*
- *Welsh Office Circular 61/96, 'Planning and the Historic Environment: Historic Buildings and Conservation Areas' (Ref. 9-8); and*
- *Welsh Office Circular 60/96, 'Planning and the Historic Environment: Archaeology' (Ref. 9-9).*

Assessment Scope and Consultation

9.10. The CHA will consider the effects of both direct and indirect (setting) impacts on the cultural heritage resource.

Consultation

9.11. A summary account of the consultations undertaken up to selection of the Proposed Line Alignments and Proposed Line Route Alignments will be provided in the Historic Environment and Cultural Heritage ES Chapter together with a full account of the consultations carried out throughout the EIA process. The CHA and the potential ASIDOHL2 studies will respond to all relevant comments received.

9.12. To enable a detailed assessment of the visual impacts of the Proposed Development on the historic environment, suitable viewpoints will be selected in areas where effects are potentially significant.

9.13. Consultation to inform the CHA and the potential ASIDOHL2 studies, including agreement on viewpoint locations and photomontage production, will be undertaken with PCC, NRW and Cadw.

Study Areas for the Cultural Heritage Assessment

9.14. The Historic Environmental and Cultural Heritage ES Chapter will define a Study Area appropriate to each type of heritage asset considered within the EIA (e.g. archaeological remains, historic buildings and historic landscapes).

9.15. The CHA will be undertaken within a specified search distance measured from the edge of the Indicative DCO Site Boundary. The search distances may differ according to the type of site (e.g. historic buildings, registered parks and gardens, listed buildings etc.) and will be agreed with PCC, NRW and Cadw in advance. In general, higher status sites such as Scheduled Ancient Monuments (SAMs), Historic Parks and Gardens, Historic Battlefields, Registered Historic Landscapes, Conservation Areas, and Grade 2* Listed Buildings are likely to need consideration over greater distances than lower status sites such as Grade 2 and locally registered Buildings and other lesser sites listed in the HER.

9.16. Issues of setting will need to consider the visual and/ or aural envelope of monuments or even more distant aspects of the asset's surroundings.

Assessment Methods

General

9.17. The CHA will collect relevant information on all significant archaeological sites (remains, buildings and landscapes) and their settings. The information will be collated using a Geographical Information System (GIS).

- *The CHA will consider the following:*
- *The nature, extent and degree of survival of archaeological sites, structures, deposits and landscapes within the defined Study Areas for the CHA;*
- *The significance of any remains in their context both regionally and nationally;*
- *The history of the defined Study Areas for the CHA;*
- *The potential impact of the Proposed Development on the setting of known sites of archaeological importance;*
- *The potential impact of the Proposed Development on the setting of previously unknown sites of archaeological importance; and*
- *The potential for further work, with recommendations where appropriate for a suitable investigative and/ or mitigation methodology.*

Desk Based Assessment

9.18. The CHA will comprise, and be informed by, the following:

- *Collation and assessment of all relevant information held in the regional Historic Environment Record (HER);*
- *Assessment of all available excavation reports and archives (including unpublished and unprocessed material) affecting the site and its setting;*
- *Assessment of all extant aerial photographic (AP) evidence and, where relevant, a re-plotting of archaeological and topographic information by a suitably qualified specialist at an appropriate scale. The main source of archaeological aerial photographic records is held at the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW), Aberystwyth;*
- *Assessment of online records held by the Portable Antiquities Scheme relating to finds from the assessment area;*
- *Assessment of archive records held at the County Archives, and as appropriate, site files held by RCAHMW;*
- *Assessment of the environmental potential of the archaeological deposits through existing data or by inference;*
- *Assessment of the faunal potential of the archaeological deposits through existing data or by inference;*
- *Assessment of the artefactual potential of the archaeological deposits through existing data or by inference;*
- *Assessment of available geotechnical information for the area including the results of test pits and boreholes; and*
- *Assessment of the present topography and land use of the area through maps and site inspection.*

9.19. The history of the Proposed Development site will also be studied. This will involve the following:

- *A review of the published resources (in particular the documents outlined above);*
- *An analysis of relevant maps and plans. Cartographic evidence is held at the County Record Offices, including tithe maps, enclosure act plans, estate maps and all editions of the Ordnance Survey. Place and fieldname evidence from these sources must be considered;*
- *An analysis of the historical documents (e.g. county histories, local and national journals and antiquarian sources) held in museums, libraries or other archives, in particular local history and archives library; and*
- *A review of the aerial photographic evidence.*

Field Survey

9.20. The field survey will consider the potential for unknown archaeological remains in the light of known data and the history of the area. If necessary, a programme of field surveys will be prepared to test the conclusions. The field survey will be undertaken on the basis of a Written Scheme of Investigations (WSI), which will be submitted to the archaeological advisors to PCC, Clwyd-Powys Archaeological Trust (CPAT), prior to the start of any survey work.

9.21. The purpose of the field survey will be to improve the information about the presence or absence, character, extent, date, integrity, quality and state of preservation of the remains affected by the Proposed Development. The field survey will be designed to provide sufficient information for the purposes of the CHA.

9.22. The field survey will be undertaken within the Indicative DCO Site Boundary and will consider the nature, extent and degree of survival of archaeological sites, structures, deposits and landscapes. The field survey will:

- *Check the condition of visible assets within the Indicative DCO Site Boundary, and record any that have not been previously noted;*
- *Note indications of ground disturbance, made ground, colluvium, alluvium, etc. which might obscure or complicate the ability to detect sites;*
- *Identify sites of palaeo-environmental potential (e.g. stream valleys, upland bogs, lowlands, etc.);*
- *Record current land-use and ground conditions; and*
- *Inform decisions about further field survey.*

9.23. Drawings will be produced comprising both measured and sketched plans and elevations at appropriate scales.

9.24. High-resolution digital photographs will be taken with the camera set to take TIFF format images with a resolution greater than eight megapixels.

9.25. The locations of previously unrecorded features will be logged using a Geographical Positioning System (GPS). A distribution plan showing the locations of known and previously unknown features in relation to the Proposed Development will be produced.

9.26. Written records will be made as appropriate.

Assessment of Visual Impact and ASIDOHL2 Studies

9.27. A desk-based assessment of the potential visual effects on all high value assets (and those with the potential to be such) will be produced by examining ZTV maps provided by the landscape and visual consultant and considering them in conjunction with the baseline GIS database of archaeological sites.

9.28. All sites identified by this process as having a potential to be impacted on by the Proposed Development will be visited.

9.29. Photographs will be taken from behind the asset, looking towards the part (or parts) of the Proposed Development where the potential effects are deemed to be greatest. Written records will be made and, in the case of the ASIDOHL2 studies, scoring appraisals made.

9.30. Subsequently, wireframe montages will be produced from the locations of those assets considered to be the most significant in terms of effects.

9.31. When assessing the visual impact of the Proposed Development on known heritage assets, consideration will be given to the potential for cumulative effects; particularly in combination with other proposed overhead lines, wind farms, transmission masts and small scale wind energy developments. If necessary, separate cumulative impact assessments will be undertaken to examine the cumulative effects on individual assets or landscapes.

9.32. The scope of the assessment of cumulative effects will be discussed and agreed with NRW, Cadw and PCC during this EIA Scoping phase.

The Site Archive

9.33. On completion of the CHA, a project archive will be prepared in accordance with the guidelines of the National Monuments Record (Wales) and the IfA. This will include all digital, photographic, drawn and written material generated by the work. The archive will be deposited with a suitable local museum or a national body such as RCAHMW.

9.34. If any finds are recovered during the site walkover, they will be catalogued and recorded according to their location. The finds will be deposited with a suitable local museum. Wherever the archive is deposited, this information will be relayed to the local HER, which for sites in Powys, is curated by CPAT.

9.35. Although there may be a period during which client confidentiality will need to be maintained, the archive and any finds will be deposited no later than one year after completion of the construction work.

9.36. Information on any new sites or significant finds located during the work will be sent to CPAT for inclusion in the HER.

Assessment of Significance

General

9.37. The CHA will include an assessment of the value of the resource, including its setting. Designated assets will have a value recognised in their citations, but undesignated assets could match or outstrip these values. In addition, the current designated status of archaeological sites and monuments may not represent their value, or their potential.

9.38. Assessments of value will consider how far the asset(s) contribute to an understanding of the past, through their individual or group qualities, either directly or potentially. This will include a consideration of whether the asset belongs to a group or a subject of study that is of acknowledged importance, and how far it retains the characteristics that can contribute to an understanding of that group or subject, or whether it offers the potential for such understanding.

9.39. The CHA will be guided by relevant legislation, national policies, acknowledged standards, designations, criteria and priorities. Development plans, archaeological research frameworks, characterisation initiatives and current research interests will be consulted in order to inform the assessment of the value of assets.

9.40. Government policy requires that an asset's 'setting' is taken into account when considering the effects of development upon it. In the broadest terms, the setting of an asset comprises the objects and conditions around it, and within which it is perceived; and in this sense all assets have settings. Not all settings, however, contribute to the value of the assets they encompass. The setting will be a combination of views, other historic features and their relationships to the asset, ambience (topography, vegetation, sound, and other sensual experiences) and context (what is known or thought about the asset, but not immediately experienced through the senses).

9.41. Magnitudes of impact will be assessed using the guidelines set out in the DMRB. This assessment will be made without regard to the value of the resource, so the total destruction of a low value site will be considered as the same magnitude of impact as the destruction of a Scheduled Ancient Monument.

9.42. Significance of effects will be assessed by combining the value of the resource and the magnitude of impact for each heritage asset, as per the matrix provided below. This process will be undertaken in light of professional judgement. For the purposes of the EIA, only moderate and major effects will be considered significant.

Value/ Sensitivity						
	Very High	Neutral	Slight	Moderate/ Large	Large or Very Large	Very Large
	High	Neutral	Slight	Moderate/ Slight	Moderate/ Large	Large or Very Large
	Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Moderate/ Slight
	Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
		Magnitude of Impact				

9.43. The CHA will contain an overview of the significance of the overall effect of the Proposed Development on the combined cultural heritage resource (archaeological remains, historic buildings and historic landscapes). The effects on individual assets will be discussed in relation to each of these sub-topics, and their relative significance considered. The intention is that the ranking of value, impact and significance will be comparable across the three subtopics (archaeological remains, historic buildings and historic landscapes), so that their relative contribution to the overall assessment is reasonably transparent. The scales of value, impact and significance are intended to be similar across the three sub-topics, so effects on different types of asset will be capable of comparison.

9.44. For an individual cultural heritage asset there may be differing degrees of effect related to each subtopic. In these cases the highest reading will be taken as the significance of effect for that asset, and it will not be 'double counted'.

9.45. If there are adverse and beneficial effects these will be brought out in the CHA, not obscured by balancing them off against one another. If there are both adverse and beneficial effects, these will be recorded separately.

9.46. The following scale of values in assessing the value/ sensitivity of the resource will be used:

Very High	World Heritage Sites and other sites of international importance – there are none of these within 10 km of the Indicative DCO Site Boundary.
High	Scheduled Monuments, undesignated assets of schedulable quality, assets that can contribute significantly to acknowledged national research objectives.
Medium	Designated or undesignated assets that contribute to regional research objectives.
Low	Assets of local importance, assets compromised by poor preservation or poor survival of contextual associations.
Negligible	Assets with little or no surviving archaeological interest
Unknown	The importance of the resource has not been ascertained

9.47. An 'Unknown' value may sometimes be all that can be determined, particularly in the early stages of a project. In these cases, an estimate of the risk of there being valuable archaeological remains that could be affected will be made together with an indication of how this risk is to be managed.

9.48. The following scale of values in assessing the magnitude of impacts will be used:

Major	Change to most or all key archaeological materials, such that the resource is totally altered, comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified.
Considerable	Changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials, such that the asset is slightly altered; slight changes to setting.
Negligible	Very minor changes to archaeological materials or setting.
No Change	No change to archaeological materials or setting.

Historic Buildings

9.49. The following scale of values will be used to assess the significance of archaeological assets:

Very High	World Heritage Sites and other sites of international importance – there are none of these within 10 km of the Indicative DCO Site Boundary.
High	Scheduled Monuments with standing remains, Grade I and Grade II* Listed Buildings, other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade, Conservation Areas containing very important buildings, undesignated structures of clear national importance.
Medium	Grade II listed buildings, unlisted buildings that have exceptional qualities in their fabric or historical associations, Conservation Areas that contain buildings that contribute significantly to its historic character, Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings.
Low	Locally Listed buildings, historic buildings of modest quality, Historic Townscape or built areas of limited historic integrity in their buildings or built settings.
Negligible	Buildings of no architectural or historical note.
Unknown	Buildings with some hidden potential for historic significance.

9.50. An 'Unknown' value may sometimes be all that can be determined, particularly in the early stages of a project. In these cases, an estimate of the risk of there being valuable archaeological remains that could be affected will be made together with an indication of how this risk is to be managed.

9.51. The following scale of values will be used to assess the magnitude of impacts:

Major	Change to key historic building elements, such that the resource is totally altered, comprehensive changes to the setting.
Moderate	Change to many key historic building elements, such that the resource is significantly modified, changes to the setting of an historic building, such that it is significantly modified.
Considerable	Changes to setting that affect the character of the asset.
Minor	Change to key historic building elements, such that the asset is slightly different, change to setting of an historic building, such that it is noticeably changed.

Negligible	Slight changes to historic buildings elements or setting that hardly affect it.
No Change	No change to fabric or setting.

Historic Landscapes (Incorporating ASIDOHL2 Studies)

9.52. The following scale of values will be used to assess archaeological assets:

Very High	World Heritage Sites, historic landscapes of international value – there are none of these within 10 km of the Indicative DCO Site Boundary.
High	Designated historic landscapes of outstanding interest, undesignated landscapes of outstanding interest, undesignated landscapes of high quality and importance, and of demonstrable national value, well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).
Medium	Designated special historic landscapes, undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value, averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	Robust undesignated historic landscapes, historic landscapes with importance to local interest groups, historic landscapes whose value is limited by poor preservation and/ or poor survival of contextual associations.
Negligible	Landscapes with little or no surviving archaeological interest.

The following scale of values will be used to assess the magnitude of impacts:

Major	Change to most or all key historic landscape elements, parcels or components; extreme visual, effects; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No Change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

9.53. It should be noted that if separate ASIDOHL2 studies are undertaken, they will use a scoring system specifically designed for use in assessing impacts (effects) on the Registered Historic Landscapes of Wales. This is a different system from that described above, which will be used in the CHA. However, no problems are anticipated, because all references to the assessment of Historic Landscapes in the CHA will use the DMRB system. ASIDOHL2 scores will only appear in the individual ASIDOHL2 studies, which will be presented as appendices to the main report.

Assessment of Cumulative Effects

9.54. The EIA will also consider the cumulative effects of the Proposed Development on the historic environment and cultural heritage assets. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

Baseline Conditions

9.55. A wide range of known heritage assets have been identified within 10 km of the Indicative DCO Site Boundary and the potential for further, previously unknown, sites is high. These heritage assets are indicated on Figure 4B (Appendix A).

9.56. As part of the optioneering and routeing design process, a Cultural Heritage Report was prepared by CPAT in March 2012. The report identified a large number of known sites along the potential route corridors that were being developed as at that time and the potential impact on these sites was considered during the selection of Preferred Line Route Alignments. As a result, the list of sites potentially affected by the Proposed Development has been greatly reduced.

9.57. A large number of sites will still remain within the defined Study Areas for the CHA and these will be assessed and visited as part of the CHA. Furthermore, it should be noted that the Clwyd-Powys Archaeological Trust (CPAT) study only considered sites within a 2 km buffer zone of the Proposed Development. While this study area is sufficient when considering direct impacts, visual impacts will need to be considered well beyond this zone. As stated above, the parameters for this work will be agreed with PCC, NRW and Cadw at the outset of the EIA.

9.58. A first step in the proposed CHA will be to create a new GIS base map overlain with updated information on heritage assets within the agreed Study Areas.

Aspects of Development Likely to Cause Significant Effects

9.59. Aspects of the Proposed Development which may give rise to significant effects at the construction stage include:

- *Effects of tree felling and hedgerow removal in terms of the visual impact on known heritage assets;*
- *The direct effects on heritage assets caused by undergrounding or diverting lower voltage overhead lines;*
- *The direct effects caused by the construction of temporary facilities during construction works and demolition works; and*
- *The cumulative visual effects on historic assets, including buildings and landscapes, of constructing of a number of connections; particularly with respect to other overhead lines, wind farms, transmission masts and small scale wind energy developments.*

9.60. In examining visual effects likely to occur during the operational stage, consideration will need to be given to any long term plans for landscape alterations.

9.61. The decommissioning stage may also give rise effects arising from the dismantling of the Proposed Development and other above ground infrastructure, ground reinstatement and the movement of materials and plant around the site, including temporary access arrangements.

Archaeological Remains

9.62. With careful mitigation, the direct impacts should not cause significant changes to the integrity of the historic landscape (either buried or standing remains). Long term effects are possible in areas where palaeo-environmental deposits have the potential for survival, such as peat deposits, because of possible changes to ground-water regimes; however, the construction activities associated with the Proposed Development are considered to be low impact and as such are not likely to be significant.

Historic Buildings and Landscapes

9.63. The Proposed Development may result in indirect cumulative visual effects with other proposed schemes such as overhead lines, wind farms, transmission masts and small scale wind energy developments.

Potential for Mitigation

9.64. When judging the potential impact of the Proposed Development, agreed mitigation measures will be taken into account in concluding on the residual likely significant effects of the Proposed Development.

9.65. An assessment of the potential for further investigative work will be included within the Historic Environment and Cultural Heritage ES Chapter. This will give recommendations, where appropriate, for a methodology for further non-intrusive survey and/ or intrusive evaluation to determine the location, extent, date, character, condition, significance and quality of any surviving archaeological remains liable to be threatened by the Proposed Development and/ or an appropriate mitigation strategy. The assessment will formulate a methodology for further archaeological investigation and/ or mitigation within a programme of research. This will consider the use of the following techniques:

- *Archaeological historic building recording/ survey;*
- *The use of geophysical survey;*
- *A programme of trenching and/ or test pits to investigate the deposit model in more detail;*
- *A programme of strip, map and sample in areas of identified potential;*
- *Design modification to preserve remains in situ;*
- *Archaeological excavation of identified remains;*
- *Archaeological watching brief on construction works; and*
- *In areas of dense forestry, use of LiDAR will be considered.*

9.66. The detail of potential further work will be agreed between SP Manweb and CPAT.

Summary and Conclusions

9.67. A full and detailed CHA will be undertaken as part of the EIA process and reported within a Historic Environment and Cultural Heritage ES chapter. The CHA will consider the effects of both direct and indirect impacts (setting) of the Proposed Development on the cultural heritage resource.

9.68. If required, distinct ASIDOHL2 studies will be produced in conjunction with the CHA. The results of these studies will be fully integrated into the CHA, although the reports themselves will be presented as appendices to the ES.

9.69. At present, it is not anticipated that the potential direct impacts of the Proposed Development will cause significant changes to the integrity of the buried archaeological resource or to standing archaeological remains.

9.70. Potential long term effects are possible in areas where palaeo-environmental deposits have the potential for survival, such as peat deposits, because of possible changes to ground-water regimes; however, the construction activities associated with the Proposed Development are considered to be low impact and as such are not likely to be significant.

9.71. With careful mitigation, the indirect visual effects of the Proposed Development on historic buildings and landscapes will be minimised. In some areas, the Proposed Development may add to the effects of existing schemes and could have a cumulative effect when considered alongside other proposed schemes such as overhead lines, wind farms, transmission masts and small scale wind energy developments.

9.72. The ES will clearly set out the cumulative effects of the construction, operation and decommissioning of the Proposed Development as well as the residual likely significant effects that may remain once mitigation measures have been considered.

10.0 FLOOD RISK AND HYDROLOGY

Introduction

10.1. This Chapter outlines the scope of the assessment that will be undertaken to inform the flood risk and hydrology chapter of the EIA. It considers the potential effects of the Proposed Development on flood risk and hydrology, including water quality, hydromorphology and groundwater and the risks to the Proposed Development from the same.

Guidance and Data Sources

10.2. The assessment will primarily be a desk-based study, drawing upon the following policy and guidance:

- *Web-based Transport Analysis Guidance (WebTAG); specifically the Water Environment Sub-Objective WebTAG Unit 3.3.11 (Ref. 10-1);*
- *Design Manual for Roads and Bridges (DMRB) 11.3.10 (Ref. 10-2);*
- *Technical Advice Note 15 (TAN15) Guidance (Ref. 10-3);*
- *Planning Policy Wales (Edition 6, February 2014) (Ref. 6-5); and*
- *Water Framework Directive (WFD) (Ref. 10-4).*

10.3. The key information and data sources for the assessment will include:

- *1:25,000 Ordnance Survey maps;*
- *British Geological Survey (BGS) 1:625,000 scale data (Ref. 10-5);*
- *The Welsh Government's Development Advice Map (DAM) website (Ref. 10-6);*
- *The Environment Agency's 'What's in Your Backyard?' website (Ref. 10-7 and 10-8)*[12]
- *Envirocheck Reports for the construction areas;*
- *Existing ground investigation reports (where available);*
- *Borehole data and mapping (available from British Geological Survey);*
- *Information requested from NRW regarding water quality, geology, hydrogeology, ecology and protected areas; and*
- *The Flood Consequence Assessment, which will be undertaken as part of the DCO application process.*

Assessment Scope and Consultation

10.4. Possible effects on hydrology and flood risk will be investigated as part of the EIA process, including the identification of both generic and specific locations sensitive to pollution risk or disturbance from engineering works. Effects identified as likely to be significant prior to the implementation of mitigation measures will then be addressed in the ES and residual effects identified. Effects considered to be of no significance will only be briefly considered, to indicate that they have not been overlooked.

10.5. SP Manweb is committed to implementing good practice construction methods and has extensive working knowledge of constructing and operating similar schemes. Notwithstanding this it is anticipated that possible effects associated with the construction phase are likely to be more significant than those associated with the operational phase including:

- *increased levels of silt laden run-off with possible sedimentation of watercourses if not properly managed ad controlled; and*
- *changes to run-off rates, volumes and base flows including possible flood risk.*

12 The Environment Agency website is currently hosting flood map data for Wales on behalf of NRW.

10.6. Subject to confirmation of the wood pole/ tower/ cable locations and of the physical extent of the works, effects which at this preliminary stage are not considered to be significant and which will therefore not be reported on in full, include:

- *pollution from spills or leaks of fuel, oil and construction materials during construction or operation;*
- *pollution or loss of public or private water supplies during construction and operation including disturbance from drilling operations;*
- *effects on groundwater recharge or groundwater levels during construction, taking account of possible dewatering activities;*
- *operational effects including modifications to natural drainage patterns, effects on flow in natural watercourses and flush zones and modification of stream channel morphology; and cumulative effects with other development proposals, including the associated wind farms; and*
- *cumulative effects with other developments being constructed at the same time, including associated wind farms.*

10.7. It is however important to emphasise that as the assessment progresses, the significance of the identified possible effects may change ad their coverage in the ES will be amended accordingly.

10.8. Consultation as to the scope of the assessment will be carried out with NRW and PCC.

Study Area for the Flood Risk and Hydrology Assessment

10.9. The spatial extent of the water environment and flood risk assessment will include the Indicative DCO Site Boundary and nearby watercourses and aquifers which could potentially be impacted as a result of the construction/ decommissioning phases (the flood risk and hydrology Study Area). This will include river sections immediately upstream and downstream of the Indicative DCO Site Boundary and the full geographical extent of potentially impacted aquifers.

Assessment Methods

10.10. The identification of potential effects to flood risk and hydrology will be undertaken using the development of a conceptual Source-Pathway-Receptor model. The model will identify the potential sources or 'causes' of impact as well as the receptors that could potentially be affected (e.g. surface and ground water resources).

10.11. The presence of a potential impact source and a potential receptor does not automatically infer that an impact will occur as there needs to be an impact pathway or 'mechanism' via which the source can affect the receptor.

Assessment of Significance

10.12. An assessment of the significance of effect will be undertaken using the methodology provided in the WebTAG; specifically the Water Environment Sub-Objective WebTAG Unit 3.3.11 (Ref. 10-1). The methodology set out in this WebTAG Unit provides an appraisal framework for taking the outputs of the EIA process and analysing the key information of relevance to the water environment. The guidance provides a method by which the significance of a potential effect can be appraised consistently by decision makers. It is based on guidance prepared by the Environment Agency and builds on the water assessment methodology in the DMRB 11:3:10 (Ref. 10-2). The acceptability of the Environment Agency's guidance in Wales and the methodology in the DMRB 11:3:10 will be determined as a result of this EIA scoping process.

10.13. The methodology enables an assessment of the significance of a potential effect by firstly considering how important or how sensitive the receptor is and secondly, by considering the likely magnitude or extent of the impact on the receptor. By combining these two elements, the significance of the potential effect can be derived. If significant adverse effects are identified, mitigation measures will be proposed to prevent, reduce or where possible offset them.

10.14. A further assessment step will then be undertaken to determine whether an impact is likely to have an effect that would result in the deterioration of a water body from its current status, or prevent a water body from achieving 'Good Status' (or potential) in the future in relation to hydro-morphology or water quality (aquatic ecology will be assessed separately). If either of these effects are predicted to occur, a major adverse effect (significant) would be applied to acknowledge that, under the WFD, all water bodies must meet the WFD objectives irrespective of their current status (and hence perceived 'importance' or 'sensitivity' in an EIA context).

10.15. A Flood Consequence Assessment will be undertaken for the Proposed Development to determine flood risk from and to the Proposed Development and any mitigation which might be required. The assessment will be compliant with Technical Advice Note 15 (TAN15) guidance (Ref. 10-3), a supplement to the Welsh Government's 'Planning Policy Wales' (Ref. 6-5), which provides a framework to assess risks arising from and to river flooding, coastal flooding, and additional runoff from development in any location.

10.16. The Flood Consequence Assessment will be submitted as a technical appendix to the ES. It will be referred to in the ES Flood Risk and Hydrology chapter to determine the significance of the effect of any changes in flood risk to the Proposed Development itself and whether the development itself has potential to increase flood risk in the area. Where potential impacts are identified, the significance of effect will be derived based upon the predicted magnitude of change and the sensitivity (or vulnerability) of the affected receptors.

Assessment of Cumulative Effects

10.17. The EIA will also consider the cumulative effects of the Proposed Development on water quality, flood risk and hydromorphology during the construction and decommissioning phases. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

Baseline Conditions

10.18. The detailed baseline conditions in relation to the water environment and flood risk will be established through:

- *Review of available information from relevant sources (as listed above);*
- *Site walkovers of river stretches where potential impact sources are proposed (such as temporary river crossings); and*
- *Review of information from other related studies prepared for the DCO application.*

10.19. The Proposed Development is located in the upper reaches of the River Severn Catchment in Powys, Wales. The Severn Uplands is dominated by the Cambrian Mountains and the area is characterised by steep sided river valleys. The region receives high volumes of rainfall, and there are numerous watercourses that feed directly into the River Severn.

Surface Waters

10.20. The Study Area crosses approximately 126 main rivers and ordinary watercourses (as identified on 1:25,000 OS Maps). Most of the watercourses to be crossed are small unnamed streams with narrow channels and the impact of the Proposed Development is not likely to be significant.

10.21. The location of the main rivers in relation to the Proposed Development is provided in Figure 2 (Appendix A) of this EIA Scoping Report. It is anticipated that the Proposed Development will cross the following main rivers:

- *Nant Wgan;*
- *Afon Banwy;*
- *Afon Gam;*
- *Nant Wythan;*
- *Afon Cwm-llwyd;*
- *Afon Carno;*
- *Afon Cledan;*
- *Colwyn Brook;*
- *Afon Trannon;*
- *Afon Cerist;*
- *River Severn/ Afon Hafren;*
- *Nant y Bradnant;*
- *Blue Lins Brook; and*
- *River Camnant.*

10.22. Depending on the micro-siting of the poles/ towers and the location of temporary construction areas (such as temporary river crossings and working areas in floodplains) these watercourses, and their associated floodplains, could be subject to varying degrees of impact.

Groundwaters

10.23. A review of the British Geological Survey (BGS) 1:625,000 scale data (Ref. 10-5) indicates that the Proposed Development is underlain by low permeability Silurian strata with areas of Quaternary drift deposits. The Silurian strata are comprised of the Wenlock, Llandovery and Ludlow Groups, which are undifferentiated mudstones, siltstones and sandstones. The drift deposits consist of areas of Glacial Till and Alluvium in the some of the larger river valleys.

10.24. The NRW Aquifer Designation maps, which are available on the Environment Agency's website[13] (Ref. 10-8), indicate that most of the Proposed Development overlies a 'Secondary B Bedrock' aquifer, and areas in the north west and south of the Proposed Development overlie a 'Secondary Undifferentiated' aquifer. These aquifer designations are defined by NRW as:

"Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers."

"Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type."

10.25. There is one Source Protection Zone (SPZ) in the region, which is situated near Llandinam, approximately 4 km east of the Proposed Development. It is anticipated that this SPZ is located at such a distance that it will not be affected by the Proposed Development.

Flood Risk

10.26. Based on the TAN 15 Development Advice Map (DAM), which is available on the Welsh Government's website (Ref. 10-3), the Study Area is located in areas designated as DAM Zones A and C2. DAM Zone A is an area with little or no risk of fluvial or tidal/ coastal flooding; DAM B is an area known to have flooded in the past evidenced by sedimentary deposits; and DAM Zone C is an area at high flood risk with a 1 in 1000 (or greater) annual probability of fluvial flooding, which is split into two zones: DAM C1 is an area of floodplain with significant flood defence infrastructure and DAM C2 is an area of floodplain without flood defences.

10.27. Based on the NRW 'Flood Map for Planning (Rivers and Sea)', which is available on the Environment Agency's website[14] (Ref. 10-7), the Study Area is located in areas designated as Flood Zones 1, 2 and 3 associated with fluvial (river) flooding. Flood Zone 3 is an area at high flood risk with a 1 in 100 (or greater) annual probability of fluvial flooding; Flood Zone 2 is an area at medium flood risk with between a 1 in 100 and a 1 in 1000 annual probability of fluvial flooding; and, Flood Zone 1 is an area at low flood risk with a greater than 1 in 1000 annual probability of fluvial flooding.

10.28. The location of the NRW's delineated Flood Zones, in relation to the Study Area is provided in Figure 4C (Appendix A) of this EIA Scoping Report. The Study Area crosses Flood Zone 3 at total of fifteen times along its length. The widest section of Flood Zone 3 crossed by the Study Area is 2.5 km across the Afon Trannon and Afon Cerist valley. The rest of the crossing sections are estimated to be between 50–200 m wide.

Aspects of Development Likely to Cause Significant Effects

10.29. Based on the proximity of hydrological receptors and flood risk sources, the scoping process has identified a number of effects that have the potential to lead to significant effects in relation to water quality, flood risk and groundwater.

13 The Environment Agency website is currently hosting this data for Wales on behalf of NRW.
14 The Environment Agency website is currently hosting flood map data for Wales on behalf of NRW.

10.30. The following potential effects, which might arise during the construction and decommissioning phases are scoped into the assessment:

- *Potential for effects on groundwater flows or quantity during the construction phase in the vicinity of excavations;*
- *Potential impact on surface water and groundwater quality from ground disturbance due to construction vehicle movements, construction activities, and storage of potentially damaging materials and substances, leading to potential WFD status effects for waterbodies;*
- *Potential impact on surface water quality from the construction of temporary access tracks, with the potential to cause minor erosion of soils along the route. During heavy rainfall soil material may be washed into watercourses by surface water runoff;*
- *The use of vehicles for construction and access also poses the risk of spillage of contaminants, such as oil and hydraulic fluid, potentially impacting on surface water and groundwater quality;*
- *Potential impact on the hydrology and flow conveyance of watercourses due to temporary bridge crossings (associated with access), which might increase the risk of blockage or constriction to flows, resulting in increased flood risk and groundwater effects; and*
- *The use of temporary construction areas and access tracks has the potential to increase surface water runoff and result in increased flood risk.*

10.31. During operation, there is unlikely to be a significant effect on flood risk either to the Proposed Development or caused by the wood pole and tower structures; however, it is proposed that the effects on flood risk are scoped into the EIA to identify any localised impacts that may occur.

10.32. Based on the proximity of hydrological receptors and flood risk sources, the scoping process has identified a number of potential effects that do not have the potential to lead to significant effects in relation to groundwater and water quality, and are therefore are proposed to be scoped out of the assessment.

- *There are considered to be no likely significant effects on water quality during the operational phase as only occasional access is required to the Proposed Development for maintenance purposes.*
- *There are considered to be no significant effects on groundwater during operation as there are no foreseeable mechanisms by which groundwater could be affected by the operation of the Proposed Development. The local geology consists of low permeability strata and there are no SPZs within 3 km of the Indicative DCO Site Boundary.*

Potential for Mitigation

10.33. The majority of the potential effects of the Proposed Development are associated with the construction and decommissioning phases. Surface water and groundwater quality risks could potentially be mitigated during the construction and decommissioning phases by:

- *Using an appropriate geotextile in the immediate vicinity of watercourse crossings to minimise damage to the surrounding ground and vegetation and minimise erosion;*
- *Implementing regular maintenance of machinery and vehicles to reduce the possibility of pollutant leakages;*
- *Dispose of waste material in accordance with relevant waste management plans and waste disposal regulations to prevent pollution; and*
- *Restoring the areas impacted by temporary access to their former state once the construction is complete.*

10.34. Potential increases in flood risk could potentially be mitigated by:

- *Ensuring that any construction areas are situated outside of recognised Flood Zones;*
- *Ensuring that temporary construction access routes and watercourse crossings are constructed with consideration of potential effects on local flows; and*
- *Installing scour protection to ensure floodwaters do not undermine the foundations of poles/ towers situated in a floodplain.*

Summary and Conclusions

10.35. The Proposed Development is located in the Severn Uplands catchment, which is characterised by numerous steep sided river valleys.

10.36. There is potential for the Proposed Development to cause significant effects on the water quality, flood risk and hydromorphology during the construction phase as a result of ground disturbance, temporary access tracks and river crossings, and movements of construction vehicles. The ES will identify particular risks to the water environment and will recommend ways in which these risks can be managed and mitigated.

10.37. It is considered that the majority of the potential effects of the Proposed Development will be associated with the construction and decommissioning phases. The operational phase of the Proposed Development will involve only occasional maintenance access along the 132kV Overhead Lines and therefore no likely significant effects on water quality are envisaged during this phase.

10.38. The local geology consists of low permeability strata and therefore it is unlikely that the Proposed Development will have significant effects on groundwater during operation.

10.39. The Proposed Development will cross Flood Zone 3 a total of fifteen times along its length. The location of poles/ towers within Flood Zones is not anticipated to have a significant effect on flood risk; however localised impacts on surface water run-off will be considered as part of the EIA.

11.0 SOCIO-ECONOMICS

Introduction

11.1. The socio-economic assessment will establish the net likely economic and social significant environmental effects that might arise as a result of the construction, operation/ maintenance and decommissioning of the Proposed Development.

11.2. Where significant adverse socio-economic effects are identified, mitigation measures will be put forward as part of the Proposed Development where appropriate to prevent, reduce, or where possible offset them. Likely significant residual effects remaining after mitigation will then be determined.

11.3. The assessment will be informed by findings from other disciplines most notably landscape and visual assessment (LVIA). However, it may also include information from the cultural heritage, and traffic and transport assessments.

Guidance and Data Sources

11.4. There is no dedicated UK legislation that specifies the detailed content required for a socio-economic assessment as part of an EIA. The assessment will therefore be based on relevant guidance produced by English Partnerships and the Homes and Communities Agency (HCA) regarding additionality (Refs. 11-1 and 11-2) and employment density (Ref. 11-3), and Technical Advice Note (TAN) 23: 'Economic Development' (Ref. 11-4).

11.5. Data sources that will be utilised include: the Census of Population (Ref. 11-5); Business Register and Employment Survey (Ref. 11-6); Annual Survey of Hours and Earnings (Ref. 11-7); Gross Value Added Sub-Regional Accounts (Ref. 11-8); Welsh Index of Multiple Deprivation (Ref. 11-9); Annual Population Survey (Ref. 11-10); Scarborough Tourism Economic Activity Monitor (STEAM) (Ref. 11-11); Welsh Government Tourism data (Ref. 11-12); tourism websites; and other academic and research work that assessed the socio-economic impacts of comparable schemes.

11.6. Other secondary research and case studies includes;

- *'Tourism Impact Assessment' (Ref. 11-13), which includes 'Proposed Beauly to Denny 400kV Overhead Transmission Line Environmental Statement', 'Environmental Statement for a 132kV Overhead Line between Legacy And Oswestry';*
- *'Carnedd Wen Wind Farm and Habitat Restoration Scheme - Assessment of Socio-Economic Benefits' (Ref. 11-14);*
- *'The Socio-Economic Benefits of the Proposed Clocaenog Forest Wind Farm' (Ref. 11-15);*
- *'STEAM Report for Powys County Council' (Ref. 11-16);*
- *'Esgair Cwmowen Wind Farm: Environmental Impact Assessment' (Ref. 11-17);*
- *'Tourism Impact Analysis: Llanbrynmair Wind Farm Proposal' (Ref. 11-18);*
- *'Domestic Tourism to Wales in 2008, 2009 and 2010' (Ref. 11-19); and*
- *'Wind Farm Consumer Research' (Ref. 11-20).*

Assessment Scope and Consultations

11.7. The socio-economic assessment will identify the likely effects of the Proposed Development on employment, the local population, direct and indirect impacts on tourism, farming/ agriculture, and tourism supporting businesses.[15]

Consultation

11.8. A summary account of the consultations undertaken up to the selection of the Proposed Line Alignments will be provided together with a full account of the consultations carried out as part of the EIA process. Other stakeholders including PCC, NRW, local businesses, and affected landowners will also be consulted.

15 Includes those falling in the following sectors; transport, retail trade (except of motor vehicles and motorcycles), food and beverage service activities, rental and leasing activities, travel agency, tour operator and other reservation service and related activities, creative, arts and entertainment activities, gambling and betting activities, and sports activities and amusement and recreation activities (as defined by ONS Tourism Unit).

Study Area for the Socio-Economics Assessment

11.9. The EIA will consider socio-economic conditions at varying spatial levels, as follows:

- *10 km from the Indicative DCO Site Boundary. This is in line with the Study Areas proposed for the LVIA and will be taken as a starting point as it is likely that the majority of socio-economic/ tourism impacts will relate to adverse visual effects and fall within this envelope. In practice, the main visual effects are likely to occur within 3 km of the Preferred Line Alignment and this is where attention will be focussed whilst being alert to potentially significant effects at a greater distance;*
- *If significant socio-economic effects are identified in the above spatial extent, then the Study Area will be expanded to enable an assessment of whether other businesses are likely to be affected further afield. For example, a tourist who walks/ cycles one of the pedestrian/ cycle trails within 10 km of the Indicative DCO Site Boundary could stay in a hotel further away which might be affected; and*
- *The baseline will also present socio-economic conditions on a broader scale to fully capture the labour market/ travel to work area (typically sub-regional) and wider tourism offer (likely to be Mid Wales).*

Assessment Methods

11.10. The following activities will be undertaken:

- *Development of a database of all potentially affected resources and receptors;*
- *Site visits;*
- *Consultation (including survey with businesses);*
- *User counts/ survey to measure usage at key resources and to capture characteristics of receptors;*
- *Review of socio-economic assessments of similar developments particularly where they capture pre and post development impacts;*
- *Assessment of employment created or lost as a result of the Proposed Development considered alongside the skills of the local workforce;*
- *Assessment of the potential impact on the local population (informed partly by the LVIA);*
- *Assessment of the potential direct physical effects resulting from the Proposed Development being sited in a particular resource, for example, a wood pole structure located in farmland or on a public footpath;*
- *Assessment of the potential effects on recreation and tourism related to people's enjoyment and appreciation of the land - based on the potential effects on views to and from tourism attractions, tourist accommodation and local community assets;*
- *Assessment of the potential indirect effects on tourism more broadly; and*
- *Assessment of cumulative effects.*

Assessment of Significance

11.11. The overall framework for impact assessment is to determine:

- *The sensitivity of receptors by assessing factors such as; whether the receptors could use a similar facility within the Study Area? What is the nature of users? Are they local/ regional/ national/ international? Are users concentrated in potentially more sensitive groups? How many people are likely to experience the impact? What proportion is that of the relevant community?*
- *The magnitude of impacts. This will predominantly be informed by the LVIA. However, it will also consider how much the user of the resource relies on visual character and how the visual effect will affect the functioning of the resource; and*
- *The consequent significance of effects by taking account of magnitude and sensitivity.*

11.12. The sensitivity and magnitude of landscape and visual effects will be presented alongside the socio-economic assessment within the Socio-economic ES chapter and any differences between the two will be fully explained.

Assessment of Cumulative Effects

11.13. The EIA will also consider the cumulative socio-economic effects of the Proposed Development. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

Baseline Conditions

11.14. The locations of the key baseline features discussed in this section are provided in Figure 4A (Appendix A).

11.15. Powys covers a quarter of the land area of Wales and is the most sparsely populated county in England and Wales, with just 26 persons per square kilometre (km2) compared to 147 in Wales. There are just fewer than 133,000 people who reside in Powys.

11.16. Powys has one of the lowest levels of productivity in the UK. Gross Value Added (GVA) per head in Powys was £13,329 per annum in 2011. This compares to £15,696 in Wales and £21,368 across the UK.

11.17. The Mid Wales Regional Tourism Strategy (Ref. 11-21) refers to the area as the '*Cinderella*' of Wales due to its relatively small resident population, less well developed tourism infrastructure and as it is one of the less well known tourism destinations in Wales.

11.18. Mid Wales has numerous opportunities for walking, cycling, riding and other outdoor activities but there are few large scale visitor attractions. The majority of attractions in Mid Wales have an association with the area's landscape and history (for example, castles and halls with associated gardens).

11.19. In and around the Study Area there are a number of socio-economic resources including:

11.20. Tourist attractions such as Glyndwr's Way (a National Trail), the Sustrans National Cycle Route 81, and the Mid Wales Shooting Centre;

- *Tourist accommodation, particularly camping and caravan sites and bed and breakfasts;*
- *Residential settlements and local community assets including Dyfnant Forest, golf courses, local trails, ancient woodlands, nature reserves and listed buildings;*
- *Farms and agricultural land; and*
- *Other businesses such as retail.*

Aspects of Development Likely to Cause Significant Effects

11.21. Aspects of the Proposed Development that could cause significant adverse effects include:

- *Effects of tree felling and hedgerow removal;*
- *Effects caused by undergrounding or diverting any existing low voltage overhead lines;*
- *Increased construction/ decommissioning traffic, which might cause delays;*
- *Construction/ decommissioning effects caused by any undergrounding of elements of the Proposed Development;*
- *Micro-siting of poles/ towers on or near to a socio-economic resources such as a farm or trail; and*
- *Effects of the Proposed Development on the landscape and on views.*

11.22. The Proposed Development could result in significant beneficial effects as a result of employment generation during construction/ decommissioning and operation.

Potential for Mitigation

11.23. The purpose of any proposed mitigation will be to prevent, reduce and where possible offset any significant adverse socio-economic effects that might result from the Proposed Development. The main strategy for minimising the adverse effects on the socio-economic context of the area is avoidance through careful planning, design and routeing.

11.24. Measures that could potentially be used to avoid or reduce potential impacts on the socio-economic resource include:

- *Pole selection – use of wood pole structures for much of the Proposed Development rather than steel towers;*
- *Micro-siting of poles/ towers in discussion with landowners to minimise the need for new construction site access tracks;*
- *Micro-siting of poles/ towers in discussion with landowners to minimise visibility from individual properties and socio-economic resources;*
- *Utilising existing field accesses wherever possible, to minimise the need for new site access tracks;*
- *Avoidance of skyline locations (i.e. those where the 132kV overhead lines are outlined against the sky with no solid background), which tend to increase the visibility of poles/ towers; and*
- *Locating poles/ towers as far away from designated routes and other public rights of way as possible.*

11.25. Opportunities for mitigation through sensitive route alignment, careful micro-siting and design of pole/ towers will continue to be explored throughout the EIA process to ensure the effects of the Proposed Development are further reduced.

11.26. A series of additional mitigation measures which cannot be identified at this stage could include the planting of hedgerows and the replacement of any trees that have been lost.

Summary and Conclusions

11.27. The socio-economic assessment will identify the likely significant effects of the Proposed Development on employment, the local population, direct and indirect impacts on tourism, farming/ agriculture, and tourism supporting businesses. The tourism offer of the Study Area is largely dependent on the rural and attractive landscape and it offers numerous opportunities for walking, cycling, riding and other outdoor activities. The socio-economic assessment will, in part, be informed by the LVIA.

11.28. The overall framework for addressing socio-economic effects includes identifying the sensitivity of receptors, predicting the magnitude of impacts and subsequently assessing the consequent significance of effects.

11.29. Where likely significant socio-economic effects are identified the ES chapter will propose mitigation measures where appropriate to prevent, reduce, or where possible offset them. The likely significant residual effects will then be determined.

11.30. Cumulative effects of the Proposed Development together with the Associated Development, Related Development and Other Relevant proposed or consented but unbuilt projects (see Chapter 5 of the EIA Scoping Report) will be considered and set out.

12.0 LAND USE

Introduction

12.1. The Land Use Chapter of the ES will consider the effects of the Proposed Development in terms of Agricultural Land Classification, land drainage, agri-environment schemes, Notifiable Scheduled Diseases, and weeds (invasive species and injurious weeds) during the construction, operation and decommissioning phases.

Guidance and Data Sources

Soils

12.2. Soils are an important natural resource and exert a strong influence on ecosystems. They play an important part in determining the pattern of land uses such as agriculture and forestry in Wales. Soil mapping has been carried out in the UK over many decades and there are a broad range of soil information maps, reports and surveys available. Cranfield University's National Soil Resources Institute (NSRI) has responsibility for retaining and disseminating soils information in England and Wales. The most comprehensive soil mapping for England and Wales is contained within the National Soils Map (NATMAP Vector), which displays the 300 mapped soil associations at a scale of 1:250,000.

12.3. The Soilscapes viewer (Ref. 12-1) contains a simplified soils dataset for England and Wales (based on NATMAP Vector) and can be interrogated for information on the soilscapes and soil descriptions. The Soilscapes dataset also contains generic details of a range of soil characteristics, including: soil texture, drainage status, soil fertility, and commonly associated habitat and landcover.

12.4. Soil classification in England and Wales is based on the observable and measurable characteristics of the soil profile, including the characteristics of the parent material and alterations of the soil caused by soil forming processes.

12.5. Information and guidance on soils is available to download from the Natural England website and data is available on Defra's geographical information website 'MAGIC' (Ref. 12-2).

12.6. The only soil types, which might affect the construction of the Proposed Development, are deep (i.e. more than 1 m in depth) organic soils such as peat. The Soil Survey of England and Wales Field Handbook (Ref. 12-3) defines peat as "*an organic deposit containing more than 40% organic matter on a dry weight basis in the upper 80cm*". It is worth noting that, in addition to those areas mapped, there are many small deposits which are of insufficient extent to be separately mapped at this scale and also that organic soils are major components of many other soil units.

Agricultural Land Classification

12.7. Agriculture Land Classification (ALC) system in England and Wales provides a method for assessing the quality of farmland to enable informed choices to be made about its future use within the planning system. The ALC system classifies land into five grades based on the potential productivity, cropping, flexibility and ease of management of an area: the grades range from 1 (excellent) to 5 (very poor). The best and most versatile land, as outlined in the NPPF, is defined as Grades 1, 2 and 3a by policy guidance. Further details of the ALC system are provided in Natural England's Technical Information Note (TIN049) (Ref. 12-4).

12.8. It is the Welsh Assembly Government's policy, as set out in Technical Advice Note 6 (Ref. 12-5), to consider the quality of agricultural land and to bear in mind that, once land is built on, restoration is rarely possible.

12.9. The Agricultural Land Classifications present within the Indicative DCO Site Boundary will be identified using the ALC map of England and Wales (Ref. 12-1).

Agri-environmental Schemes

12.10. Agri-environment schemes (AES) provide funding to farmers and land managers to farm in a way that supports biodiversity, enhances the landscape, and improves the quality of water, air and soil. Glastir is the Welsh Government's primary sustainable land management scheme for Wales.

12.11. The status of Glastir within the Indicative DCO Site Boundary will be reviewed, and any relevant land areas identified.

Assessment Scope and Consultation

12.12. Potential effects on Land Use within the Indicative DCO Site Boundary are anticipated to be either temporary or permanent, as follows;

- *Temporary – construction and decommissioning phases:*
  - *Integral Access areas;*
  - *Preferred Line Route Alignments; and*
  - *Integral Construction areas.*
- *Permanent – operational phase facilities including:*
  - *Wood pole structure/ steel tower locations.*

12.13. Information regarding farming operations, existing soil conditions, field land drainage and services, etc. will be obtained from farmers and farm tenants via consultations between them and the land agent. More detailed information on Glastir and organic land will be obtained via discussions with farmers, and with Welsh Assembly Government.

12.14. Information on notifiable pests and diseases will be obtained and advice will be sought, as necessary, from NRW regarding any necessary bio-security measures.

Study Area for Land Use Assessment

12.15. The study area for the land use assessment will be confined to the Indicative DCO Site Boundary as this is where significant effects on land use are likely to occur.

Assessment Method

12.16. An assessment of the potential impacts of the Proposed Development on land use (ALC, land drainage, Glastir, Notifiable Scheduled Diseases and weeds), and the determination of the significance of the effects arising from these impacts, will be undertaken largely by means of a desk study, utilising information from the published sources and from specific liaison and consultation.

12.17. The assessment will consider the following aspects:

- *Land-take: this will be assessed in terms of quantity and quality, and the losses evaluated against national and local criteria;*
- *Soils: the workability of topsoils and their suitability for reinstatement will be described, and effects assessed on the assumption that good working practice is followed;*
- *Farming practice: the methods of agricultural working will be described, and the impact of the Proposed Development assessed. Where alternative methods of working are possible, these will be examined. Losses in terms of cropping, and increased time to travel to remaining land will be considered;*
- *Access: the general effect on access both into and out of farms and internally within units will be considered;*
- *Economic effects: the effect of the Proposed Development will be described and assessed in terms of broad economic impact. Comparative assessments will be made to evaluate the order of magnitude of the impact. These will be for a comparative assessment only, using standardised data, and will not necessarily reflect accurately the potential financial losses on each farm. It should be noted that the purpose of this assessment will be to indicate the magnitude of impact and not to evaluate levels of compensation payable;*
- *Drainage and water supply: disruption of field drains and water supplies requiring diversion or repair will be considered; and*
- *Glastir: details of the schemes, areas and zones which might be affected by the Proposed Development will be considered.*

12.18. The assessment of land use effects will be closely aligned with the assessment of socio-economics.

Assessment of Cumulative Effects

12.19. The EIA will also consider the cumulative effects of the Proposed Development on land use. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

Baseline Conditions

12.20. Owing to the predominantly rural nature of the area land use along the Preferred Route Line Alignments is dominated by a mix of pasture for grazing with some small scale arable farmland.

12.21. The study area also includes small blocks of coniferous and broadleaved woodlands, some of which are commercial in nature.

12.22. In the more upland areas, the agriculture is based on permanent pasture and rough grazing used for extensive livestock systems.

Aspects of Development Likely to Cause Significant Effects

12.23. The majority of the potential effects on normal farming operations will arise during the construction and decommissioning phases and are likely to include:

- *Temporary loss of crop production and grazing areas within the Study Area;*
- *Disruption to normal farm activities;*
- *Temporary severance of fields or division of fields;*
- *Temporary separation of livestock from water supplies;*
- *Disturbance during lambing season, depending on the time of the works;*
- *Disruption to field drainage and water supplies, which may require diversion or repair;*
- *Impact on the commitments made by the farmers/ landowners, etc. with regard to AES; and*
- *Increased risk of disease transmission and transfer of invasive weeds associated with vehicle movements along the working corridor.*

12.24. Potential operational effects on agriculture as a result of the Proposed Development are as follows:

- *Land-take: permanent loss of small areas of operational agricultural land associated with the footprints of wood pole and tower structures.*
- *Soils: the construction of the proposed connection will require the tracking of vehicles across agricultural land, potentially resulting in the compaction of underlying soils, damage to the soil structure and a potential long term reduction in overall soil grade.*

12.25. With the exception of permanent operational land-take, all of the identified effects can be mitigated such that the overall residual effects are likely to be of negligible to minor significance.

Potential for Mitigation

12.26. Landowner liaison will aid in identification of opportunities for mitigation, which will be fed back to the design team to support the detailed design stage.

12.27. Mitigation measures will be informed by further detailed routeing and design, and will be proposed within the Land Use ES chapter. Where significant effects cannot be 'designed out' of the development (through sensitive alignment etc.), opportunities for reduction and offset of effects will be considered.

Summary and Conclusions

12.28. The Land Use ES chapter will consider the potential effects on land use that might arise as a result of the construction, operation and decommissioning of the Proposed Development. It will also consider the potential for cumulative effects to occur.

12.29. The assessment will draw upon the latest data, landowner information and guidance and best practice and will demonstrate compliance with applicable regulations and code of practice.

13.0 NOISE AND VIBRATION

Introduction

13.1. It is anticipated that the Proposed Development has potential to cause noise effects as a result of construction noise impacts during the construction an decommissioning phases. This Chapter outlines the proposed scope of the EIA in relation to construction noise and cumulative construction noise.

13.2. It is not anticipated that significant effects from vibration and operational noise (i.e. from corona discharge) would arise as a result of the Proposed Development and a rationale for scoping these out of the EIA is provided below:

Construction Vibration

13.3. The only significant ground borne vibration anticipated during the construction of the Proposed Development would result from the use of a continuous flight auger. A review of the historical data given within British Standard 5228-2:2009 (Ref. 13-1) for continuous flight augers (of larger size than that which would be utilised in the construction of the Proposed Development) indicates that levels of ground borne vibration would be imperceptible to humans at distances of 20 m and greater.

13.4. The effects of construction vibration are expected to be negligible and are therefore proposed to be scoped out of the EIA process.

Operational Vibration

13.5. The operation of the Proposed Development will not cause ground borne vibrations and therefore operational vibration is proposed to be scoped out of the EIA process.

Operational Noise

13.6. The noise generated from some operational overhead lines can result in a hum and crackle caused by corona discharge from the line. The noise levels generated from corona discharge are related to the design of the conductors, the altitude of the lines above sea level, and the electrical potential within the power line. Transmission lines are designed to operate such that corona discharge does not occur; however, as a result of contamination build up on the line, damage to the conductor surface, or precipitation, some corona discharge noise may occur.

13.7. The National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref. 6-3) provides advice on the consideration of noise from operational overhead transmission lines. Guidance and an assessment methodology for assessing noise from operational overhead transmission lines is given in Technical Report TR(T)94 'Method for Assessing the Community Response to Overhead Line Noise' (Ref. 13-2). This guidance does not provide a methodology for quantification of physical noise levels and therefore reference has been made to the EPRI Transmission Line Reference Book (Ref. 13-3), which provides general guidance on noise levels from transmission lines and a methodology for the prediction of noise levels under various weather conditions.

13.8. The EPRI Transmission Line Handbook suggests that the noise emissions from overhead transmission lines are primarily driven by the voltage potential of the lines. As the maximum voltage potential of the Proposed Development will be 132kV, it is expected that the resulting noise emissions will be minimal. Consequently, the assessment of operational noise from corona discharge is proposed to be scoped out of the EIA process.

13.9. Operational underground cables do not emit noise and will not be considered within the EIA.

Guidance and Data Sources

13.10. The British Standard 5228-1:2009+A1: 2014 "Code of practice for noise and vibration control on construction and open sites Noise" (Ref. 13-4) provides guidance that is relevant to the proposed scope of the noise assessment outlined within this Chapter:

Assessment Scope and Consultation

13.11. The EIA will consider the potential for the Proposed Development to cause noise impacts during the construction and decommissioning phases of the project. It is anticipated that noise effects from decommissioning works will be no greater than those associated with the construction works. As such, the assessment of noise generated by construction works will be applicable to both the construction and decommissioning phases of the Proposed Development.

Study Area for the Construction Noise Assessment

13.12. The construction noise assessment Study Area will be confined to the Indicative DCO Site Boundary and will include the closest noise sensitive receptors.

Assessment Methods

13.13. The potential noise impacts from the construction of the Proposed Development will be assessed using BS 5228-1:2009+A1: 2014 (Ref. 13-4), which provides a scope and methodology for the consideration of noise from construction activities, methodologies for predictions and suggests assessment criteria whereby significant impacts may be defined.

Assessment of Significance

13.14. The 'ABC method' contained within BS 5228-1:2009+A1:2014 (Ref. 13-4) defines noise level limits which, if exceeded, may result in significant effects. Table E.1 from BS 5228-1:2009+A1:2014 is reproduced below in Table 13.1.

13.1 | Construction Noise Threshold of Potential Significant Effect

Assessment Category and Threshold Value Period	Threshold Value (dB)		
	Category A a)	Category B b)	Category C c)
Night-time (23:00 – 07:00)	45	50	55
Evenings and Weekends d)	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A potential significant effect is indicated if the LAeq,T noise level arising from site exceeds the threshold value for the category appropriate to the ambient noise level. NOTE 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total LAeq,T noise level for the period increases by more than 3 dB due to site noise. NOTE 3: Applies to residential receptors only.			
Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values. Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values. Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values. 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays, 07:00 – 23:00 Sundays.			

13.15. Therefore, as the anticipated construction operations would only be undertaken during the weekday daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00), and the prevailing ambient noise levels are expected to be below the Category A values, then a noise level limit of 65 dB LAeq,T is deemed to be appropriate at all residential receptors.

Assessment of Cumulative Effects

13.16. The EIA will also consider the cumulative effects of construction noise associated with the Proposed Development. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

13.17. As significant effects from vibration and operational noise are not expected to arise as a result of the Proposed Development, these aspects will also scoped out of the cumulative assessment.

Baseline Conditions

13.18. The construction noise Study Area is predominantly rural with scattered residential dwellings and some smaller village settlements. Sources of ambient noise in the locality are expected to consist of local road traffic, agricultural sources, wildlife, and potentially wind turbine noise.

13.19. A baseline noise survey has not been undertaken at this point in time, although it is anticipated that ambient noise levels would be very low within the construction noise Study Area, and representative of a rural location.

13.20. It is proposed that baseline noise levels surveys would not be required to inform the EIA, as the adoption of the lowest construction noise threshold value from BS 5228-1:2009+A1:2014 (Ref. 13-4) would represent a conservative approach.

13.21. The scope of the baseline noise assessment, duration and the identification and agreement of receptor locations will be undertaken in consultation with PCC's Environmental Health Department.

Aspects of Development Likely to Cause Significant Effects

13.22. The main sources of potential noise impacts during the construction phase include the use of heavy earth moving plant, foundation excavation (including use of continuous flight auger) and the movement of construction vehicles through adjacent areas. These sources of noise could impact nearby sensitive receptors, such as residential properties, community facilities (e.g. schools) and ecological receptors. These effects will be temporary, intermittent and highly localised.

13.23. Although wood pole structures and lattice towers generally do not require piled foundations, this is dependent on ground conditions. Therefore, there is the slight potential for piling to be required of some tower foundations on BNC located in areas of softer ground. There are, however, few receptors close to the area of BNC where the towers are located and it is unlikely that there will be any significant effects.

Potential for Mitigation

13.24. The potential for mitigation exists via the ongoing design of the Preferred Line Alignments within the Preferred Line Route Alignments. Further mitigation exists through the micro-siting of the pole structures/ towers that may have a marginal effect on the potential for noise effects during construction.

13.25. The implementation of mitigation in the form low noise plant, temporary screens, and the implementation of best practice to minimise noise impacts may also be explored.

Summary and Conclusions

13.26. Construction noise from the erection of the Proposed Development is expected to be extremely transient in nature at any given receptor. The proposed noise level limit of 65 dB LAeq,12h for weekday operations is unlikely to be exceeded given the nature of the works to be undertaken. It is proposed that the assessment of construction noise is considered in the EIA process to ensure that no significant effects arise and to enable suitable mitigation measures to be identified, where necessary. The impacts associated with future decommissioning are envisaged to be no greater than the impacts from construction and so are scoped out.

13.27. The EIA will also consider the cumulative effects of construction noise associated with the Proposed Development.

13.28. The potential for construction ground borne vibration impacts have been shown to be minimal, and it is considered highly likely that ground borne vibration will be imperceptible at all receptors within the Indicative DCO Site Boundary. Therefore, there are no significant effects from ground borne vibration anticipated and this aspect of assessment is proposed to be scoped out of the EIA process.

13.29. The operational noise from the 132kV Overhead Lines is expected to be minimal, owing to the low voltage potential. Consequently, no significant effects are anticipated, and an assessment of operational noise for the Proposed Development is proposed to be scoped out of the EIA process.

14.0 TRAFFIC AND TRANSPORT

Introduction

14.1. Traffic flows associated with the construction and decommissioning of overhead lines are generally very low and as such the traffic associated with the Proposed Development is not anticipated to give rise to any significant effects on the surrounding highway network.

14.2. The Traffic and Transport ES chapter will present an overview of the key traffic and transport implications associated with the construction and decommissioning phases of the Proposed Development. During these phases of development there will be a requirement to transport new materials and equipment by road. Other modes of transport (e.g. rail and water) are considered to be not feasible given the requirement to deliver materials to locations in remote areas over difficult terrain and over a wide area.

14.3. The types of vehicles required for construction of the Proposed Development are of a standard specification and can be used on the public highway with no escort vehicles or the need to deliver outside the working day. There would be no requirement for vehicles that would be described as an 'Abnormal Indivisible Load'[16] (AIL).

14.4. Once constructed, traffic flows associated with the operational phase will be limited to inspection and maintenance. These flows are typically one light vehicle per day and the occasional HGV to deliver material or replacement parts (likely to be one per month). This level of traffic will result in negligible transport effects during the operation/ maintenance phase of the Proposed Development and therefore assessment of operational traffic is proposed to be scoped out of the EIA process.

Guidance and Data Sources

14.5. The information used in the assessment of traffic and transport effects will comprise:

- *Information on the method of construction, the timescale of construction and the location of construction areas and accesses;*
- *Information on proposed haul routes and construction traffic numbers; and*
- *Ordnance survey mapping of the DCO application boundary and surrounds.*

14.6. Two key documents will be referred to during the preparation of the Traffic and Transport ES chapter to ensure the assessment is undertaken in line with current best practice. These are:

- *The Department for Transport's (DFT's) 'Guidelines for Transport Assessment' (GTA) (Ref. 14-1); and*
- *IEMA's 'Guidelines for the Environmental Assessment of Road Traffic' (Ref. 14-2).*

Assessment Scope and Consultation

14.7. The Traffic and Transport ES chapter will comprise an assessment of the effects of the construction and decommissioning traffic for the Proposed Development on the existing transport infrastructure. It will follow an agreed scope and recognised guidance in IEMA's Guidelines for the Environmental Assessment of Road Traffic (Ref. 14-2).

Consultation

14.8. Consultations with various parties will be on-going during the EIA process and during preparation of the ES chapter. The scope of work will be agreed directly with the relevant Transportation Officers at PCC and Mid Wales Trunk Road Agency and is envisaged to comprise:

- *Establishment of baseline conditions for road traffic based on available data and recent surveys;*
- *Establishment of construction traffic flows and routeing;*
- *A forecast of the likely distribution of trips across the catchment area;*
- *An assessment of the surrounding road network and identification of any improvements required for construction HGVs;*

16 Defined in The Road Vehicles (Authorisation of Special Types) (General) Order 2003.

- *Assessment of the transport implications of the Proposed Development in combination with consented development and highway schemes; and*
- *A summary of the likely significant residual and cumulative effects and consideration of mitigation measures, where appropriate, to reduce any adverse effects of changes in trip generation and distribution.*

Study Area for the Traffic and Transport Assessment

14.9. The Study Area for the traffic and transport assessment will be agreed with PCC and the Mid Wales Trunk Road Agency as part of the consultation stage and is likely to include all roads identified as delivery routes for construction/ decommissioning.

14.10. The most significant roads in the surrounding area are the A458, B4395, A470, B4568, B4569, A489, A483 and A44 (see Figure 2, Appendix A).

14.11. The Cambrian rail line between Shrewsbury and Aberystwyth crosses the BSC and CC Preferred Line Route Alignments 1.6 km northwest of Carno and 1.25 km northwest of Clatter (see Figure 2, Appendix A).

Assessment Methods

14.12. The scope of the assessment of construction traffic and transport effects will include all traffic routes on the surrounding public highway network including trunk roads, A and B class roads and unclassified roads which will provide transport access to the integral construction areas.

14.13. The assessment will produce the forecast traffic generation associated with each section of the Proposed Development. Based on the project programme and phasing of each stage of the construction works, the predicted construction vehicle numbers for each section will be identified, together with the duration of this traffic. The distribution of traffic will be based upon assumptions regarding construction haulage roads and sources of materials.

14.14. An initial review of the proposed delivery routes to the integral construction areas within the Indicative DCO Site Boundary will be undertaken to comment on any key constraints to construction traffic based on initial reviews of the standard of the roads and strengths of bridges etc. Information will be presented on the likely requirement for highway improvements where the review indicates that the current standard of road at certain locations is not suitable for HGV movements.

14.15. Effects on railways, footpaths and Public Rights of Way are likely to be related to visual, ecological and cultural heritage impacts and will be covered within the respective chapters of the ES.

Assessment of Significance

14.16. The significance of any traffic impact will be assessed in line with the DfT's GTA (Ref. 14-1) and also IEMA's Guidelines for the Environmental Assessment of Road Traffic (Ref. 14-2).

14.17. Changes in traffic delays will be assessed relative to the current capacity on the highway network. Delays are only likely to be assessed as significant where there are increases in traffic on parts of the network already considered to be at, or close to, capacity.

Assessment of Cumulative Effects

14.18. The EIA will also consider the cumulative effects of the Proposed Development on traffic. The cumulative assessment will be carried out in line with methodology set out in Chapter 5 of this EIA Scoping Report.

14.19. A review of the Transport Assessments and Traffic Management Plans for the above projects will be undertaken to identify:

- *shared transport routes;*
- *cumulative traffic forecasts on each route;*
- *timescales; and*
- *any proposed highway improvements for abnormal loads etc.*

14.20. From this review the interaction of construction traffic between the various developments will be assessed where they overlap with the proposed transport routes of the Proposed Development.

Baseline Conditions

14.21. Baseline traffic and highway information for the roads identified within the Study Area for the traffic and transport assessment will be collected from the following sources:

- *Existing traffic count data;*
- *Information gathered from site visits;*
- *OS mapping; and*
- *Consultations.*

14.22. The baseline year will be 2014 and traffic growth factors using TEMPro 6.2 will be used to factor base year flows to the start of construction (forecast to be 2016).

Aspects of Development Likely to Cause Significant Effects

14.23. There are no potential aspects identified at this stage that would cause likely significant traffic effects on the surrounding highway network. Additional construction and decommissioning traffic flows would be low and likely to comprise:

- *Vehicles for construction staff – light vehicles/ vans/ 4x4s (estimated to be 1 to 3 vehicles per day);*
- *Delivery of plant – HGVs and low loaders (estimated to be 1 per day); and*
- *Delivery of construction material/ poles/ towers – HGVs (estimated to be 1 per day, at start and finish of sections).*

14.24. Once construction is completed there would be no traffic effects apart from the occasional inspection and maintenance vehicles.

14.25. There is a possibility that some local temporary widening of some of the delivery approach roads may be required to provide suitable access for HGVs. The potential effects of this would be considered in the ES, as necessary.

14.26. From this review the interaction of construction traffic between the various developments will be assessed where they overlap with the proposed transport routes of the Proposed Development.

Potential for Mitigation

14.27. Where required, suitable mitigation measures will be identified and agreed with PCC for accommodating the additional construction traffic on the surrounding roads. These measures may include:

- *Preparation of a Construction Traffic Management Plan; and*
- *Highway improvements, such as road widening, provision of passing places and road structure strengthening etc.*

Summary and Conclusions

14.28. The generation of traffic associated with the construction and decommissioning of the Proposed Development is not anticipated to cause likely significant effects on the local highway network; however this will be assessed and presented in more detail in the full Traffic and Transport ES chapter.

14.29. The EIA will also consider the cumulative effects of the Proposed Development on traffic.

15.0 ELECTRIC AND MAGNETIC FIELDS

Introduction

15.1. The Electric and Magnetic Fields ES chapter will consider the likely significant effects from electric and magnetic fields (EMFs) produced during the operational phase of the Proposed Development. During construction, and prior to energisation, transmission equipment will not produce any significant EMFs and construction impacts have therefore been scoped out of the assessment.

15.2. To avoid unacceptable adverse effects from EMFs, the design of the Proposed Development will ensure that EMF exposure is within relevant public exposure guidelines.

Guidance and Data Sources

15.3. EMFs and the electromagnetic forces they represent are an essential part of the natural world. Their sources are the charged fundamental particles of matter (principally electrons and protons). Electromagnetic forces are responsible for the physical properties of materials and they mediate all the processes of chemistry, including those of life itself. Measurable electric and magnetic fields occur naturally within the body in association with nerve and muscle activity. We are also exposed to natural electric fields in the atmosphere as well as the natural magnetic field of the earth (to which a magnetic compass responds).

15.4. Electric field strengths are measured in volts per metre (V/m). The natural atmospheric electric field at ground level is normally about 100 V/m in fine weather and may rise to many thousands of V/m during thunderstorms. Magnetic fields, for practical purposes, are measured in microtesla (μT) and the Earth's natural magnetic field is approximately 50 μT in the UK.

15.5. All 132kV overhead lines produce EMFs and these tend to be highest directly under a line and decrease to the sides with increasing distance. Although putting cable underground eliminates the electric field, cables still produce magnetic fields, which are highest directly above the cable.

15.6. The National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref. 6-3) notes that the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has developed health protection guidelines for both public and occupational exposure and that:

15.7. "*undergrounding of a line would reduce the level of EMFs experienced, but high magnetic field levels may still occur immediately above the cable" and that "It is not the Government's policy that power lines should be undergrounded solely for the purpose of reducing exposure to EMFs.*" (Ref. 6-3)

15.8. EMF's produced by overhead lines are normally much lower than the ICNIRP exposure levels. The Health Protection Agency's Radiation Protection Division (HPA RPD, now part of Public Health England) provides advice on standards of protection for exposure to non-ionising radiation, including extremely low frequency (ELF) EMFs arising from the transmission and use of electricity. In March 2004, the National Radiological Protection Board (also now part of Public Health England) published a report (Ref. 15-1) that recommended that the UK follow the exposure guidelines published by the ICNIRP in 1998.

15.9. The ICNIRP guidelines form the basis of EU recommendations on public exposure and a directive on occupational exposure. They provide for basic restrictions on exposures of members of the public that are a factor of five lower than for those who are occupationally exposed (Ref. 15-2). For electric fields, the guideline level for human exposure is 5000 V/m and for magnetic fields it is 100 μT.

15.10. The Stakeholder Advisory Group on Extremely Low Frequency Electromagnetic Fields, known as SAGE, was established by the Department of Health to consider possible precautionary measures in relation to EMFs. SAGE has published two reports: the First Interim Assessment (2007) (Ref. 15-3) and the Second Interim Assessment (2010) (Ref. 15-4). The UK Government's published responses (Ref. 15-5 and Ref. 15-6) to the SAGE assessments conclude that the available evidence does not support the mandatory introduction of corridors around the overhead lines as proposed by some members of SAGE.

15.11. Following the publication of the SAGE reports, the Government prepared the Voluntary Code of Practice (Ref. 15-7), which sets out what will be regarded as suitable evidence of compliance with the ICNIRP guidelines as far as the electricity system is concerned. The electricity industry complies with the ICNIRP guidelines on a voluntary basis.

15.12. National Policy Statement EN-5 confirms 'the balance of scientific evidence over several decades of research has not proven a causal link between EMFs and cancer or any other disease' (Ref. 6-3). Public Health Wales (and Public Health England) keeps under review emerging scientific research and/ or studies that may link EMF exposure with various health problems and will consider the possible need for introducing further precautionary measures.

15.13. The Department of Health's Medicines and Healthcare Products Regulatory Agency (MHRA) does not consider that transmission line EMFs constitute a significant hazard to the operation of pacemakers.

15.14. There is little evidence that exposure of crops, farm animals and natural ecosystems to transmission or distribution line EMFs have any agriculturally significant consequences.

15.15. There is no direct statutory provision in the planning system relating to protection from EMFs and the construction of new overhead power lines near residential or other occupied buildings. However the Electricity Safety, Quality and Continuity Regulations 2002 (Ref. 15-8) set out the minimum height, position, insulation and protection specifications at which conductors can be strung between wood poles and towers to ensure clearance of objects. The design of the Proposed Development complies with these requirements.

Assessment Scope and Consultation

15.16. Comments received from Public Health Wales and PCC in response to this EIA Scoping Report will be incorporated into the assessment to ensure potential health impacts associated with the electric and magnetic fields are considered.

15.17. The EMFs from the 132kV Overhead Lines will be calculated using the conditions set out in the DECCs 'Code of Practice: Power Lines: Demonstrating Compliance with Public Exposure Guidelines' (Ref. 15-7) and evaluated against UK Government guidelines to demonstrate compliance.

15.18. The following tasks will be undertaken:

- *Identification of sensitive receptors in the Study Area;*
- *Desk based assessment, which will illustrate that the 132kV Overhead Lines are in accordance with the DECC Code of Practice (Ref. 15-7); and*
- *Details will be gathered and presented on the height, position, insulation and protection specifications for the 132kV Overhead Lines to ensure compliance with the Electricity Safety, Quality and Continuity Regulations 2002 (Ref. 15-8).*

Aspects of Development Likely to Cause Significant Effects

15.19. Given the above information, no significant environmental effects are likely to occur as a result of EMFs generated by the Proposed Development.

15.20. Whilst it is not considered likely that there will be any significant environmental effects arising as a result of EMFs, SP Manweb considers that even a remote possibility of a health risk must be taken seriously because very large numbers of people are exposed to power frequency fields from both overhead lines and underground cables and from many other sources, including domestic appliances.

15.21. Further studies are in progress in the UK and elsewhere to establish whether or not there is any genuine health risk. SP Manweb will continue to act upon the current advice of the Government and Public Health England and Wales in this matter.

Potential for Mitigation

15.22. The height, position, insulation and protection of the 132kV Overhead Lines will comply with the Electricity Safety, Quality and Continuity Regulations 2002 (Ref. 15-8). Compliance with the guidelines will be achieved through the design, so it is considered that no additional mitigation measures will be required.

Summary and Conclusions

15.23. The Electric and Magnetic Fields ES chapter will consider the potential effects on public health that might arise as a result of the Proposed Development. The assessment will draw upon the latest guidance and best practice and demonstrate compliance with applicable regulations and code of practice.

16.0 OTHER ISSUES TO BE SCOPED OUT OF THE EIA

Introduction

16.1. A number of technical assessments, common to the EIA process, are not considered relevant to the EIA of the Proposed Development as no likely significant environmental effects are anticipated to occur. The term 'significant' is an important distinction because a development may cause minor impacts to occur which do not have likely significant environmental effects.

16.2. It is proposed that assessment of the following environmental themes is not required as part of the EIA for the Proposed Development and that these themes are 'scoped out' of the ES:

- *Air quality;*
- *Ground conditions;*
- *Civil and military aviation;*
- *Other emissions;*
- *Waste; and*
- *Contribution to climate change.*

16.3. A detailed justification for scoping out these topic areas is presented below.

Air Quality

16.4. It is unlikely that construction dusts or vehicle emissions/ particulate matter would have a significant effect on residential properties or ecologically designated sites for the following reasons:

- *Anticipated traffic movements generated by the Proposed Development during construction/ decommissioning are expected to be low and will, as far as possible, use existing access roads and tracks;*
- *Good site management practices will be implemented to minimise generation of construction dusts;*
- *Site clearance and reinstatement works will be phased throughout the construction programme, thereby minimising the length of exposure of areas of bare ground;*
- *Significant emissions to air during the operational/ maintenance phase are not anticipated as, with the exception of exhaust emissions from the occasional maintenance vehicle, there will be no polluting emission sources or dust generation.*

16.5. Consideration of the potential effects of the Proposed Development upon air quality is therefore proposed to be scoped out of the EIA.

Other Emissions

16.6. Other emissions comprise other potential sources of pollution not already covered elsewhere in the EIA, such as fuel/ oil spillages and leakages, mud and light pollution.

16.7. It is considered that such emissions will either not occur or will not be significant, as they will be controlled by good site management practice, throughout the construction, operational and decommissioning phases of the Proposed Development.

16.8. These issues are therefore proposed to be scoped out of the EIA.

Ground Conditions

16.9. It is unlikely that the Proposed Development will have significant effects on ground conditions for the following reasons:

- *Due to the upland and rural setting of the Proposed Development, it is unlikely that areas of contaminated land will be encountered within the Indicative DCO Site Boundary;*
- *The potential for contamination of soils during construction and decommissioning will be controlled by good site management practice;*

- *The Proposed Development will not require disturbance or removal of large quantities soil materials; and*
- *Compaction of soils will be limited to construction areas and will be minimised through design, good site management practices, and traffic management.*

16.10. Detailed geotechnical investigations will be carried out pre-construction to deal with engineering risks in terms of ground stability.

16.11. These issues are therefore proposed to be scoped out of the EIA.

Civil and Military Aviation

16.12. Civil and aviation interests are proposed to be scoped out of the EIA; however, it is understood that the area is used by jets for training purposes and therefore consultation will be undertaken with the Civil Aviation Authority to seek confirmation of this approach.

Waste

16.13. The amount of waste that will be processed and removed from the site is anticipated to be minimal and, given SP Manweb's commitment to implement good site management practice during the construction/ decommissioning phase, the potential environmental effects are not likely to be significant.

16.14. A specific ES chapter in consideration of waste is not proposed; however, a section summarising SP Manweb's proposed waste management procedures will be provided in the ES. This section will identify and describe the methods, control process and mitigation procedures for storing and transporting waste off site.

Contribution to Climate Change

16.15. The Overarching National Policy Statement for Energy (EN-1) states that:

16.16. "*climate change is likely to mean that the UK will experience hotter, drier summers and warmer, wetter winters. There is likelihood of increased flooding, drought, heat waves and intense rainfall events, as well as rising sea levels*." (Ref. 6-2)

16.17. The construction and operation of distribution network infrastructure will lead to a minor increase in emissions through embodied energy in materials and transport; however this contribution to climate change is not considered significant

16.18. During Operation, the Proposed Development will not give rise to emissions or direct effects which could influence the climate.

16.19. It is therefore proposed that consideration of the Proposed Development's contribution to climate change is scoped out of the EIA.

17.0 SUMMARY

17.73. An EIA for the Proposed Development will be carried out in accordance with the procedures set out in the EIA Regulations (Ref. 1-6).

17.74. The findings of the EIA will be reported within an ES, which will be submitted as supporting information with the application to the Secretary of State for a Development Consent Order for the Proposed Development under the Planning Act 2008 (Ref. 1-4).

17.75. Having considered the potential key environmental issues associated with the Proposed Development, it is proposed that the EIA will include assessments of the following specialist technical topics:

- *Planning Policy;*
- *Biodiversity and Ecology;*
- *Landscape and Visual Amenity;*
- *Historic Environment and Cultural Heritage;*
- *Flood Risk and Hydrology;*
- *Socio-Economics;*
- *Land Use;*
- *Noise and Vibration (during construction);*
- *Traffic and Transport;*
- *Electric and Magnetic Fields;*
- *Cumulative Impact Assessment; and*
- *Cross Disciplinary Cumulative Effects.*

17.76. The technical assessments, including cumulative assessments will be reported within individual chapters of the ES.

17.77. The proposed content of the ES is discussed in Chapter 4 of this Scoping Report and the proposed scope of the technical assessments to be carried out for each of these EIA themes in provided in Chapters 5-16. A summary of the proposed scope of the EIA is presented in Tables 17.1 and 17.2.

17.1 | Summary of EIA Scope – Issues to be Scoped In

Topic/ Issue	Scope of Studies to be Scoped In to the EIA
Biodiversity and Ecology	The ecological and ornithological ES chapter will consider of potential effects of the Proposed Development upon designated sites and habitats, notable plants, invasive plants and protected/ notable species within the specified Study Area during the construction, operation and decommissioning phases. Appropriate Phase 1 and Phase 2 surveys will be undertaken and reported.
Landscape and Visual Amenity	The Landscape and Visual Amenity ES chapter will consider the potential effects of the Proposed Development upon the landscape in its own right and effects on views and residential visual amenity within the specified Study Area during the construction, operation and decommissioning phases. An assessment of potential cumulative landscape and visual effects will also be undertaken. The assessment will include field based appraisal, production of appropriate Zones of Theoretical Visibility and photographs and visualisations.

17.1 | Summary of EIA Scope – Issues to be Scoped In	
Historic Environment and Cultural Heritage	The Historic Environment and Cultural Heritage ES chapter will consider the effects of both direct and indirect impacts (setting) of the Proposed Development on the cultural heritage resource. A full and detailed historic environment and cultural heritage assessment will be undertaken as part of the EIA and reported within the ES. If found to be required as a result of this scoping exercise, distinct ASIDOHL2 studies will be produced. The results of these studies will be fully integrated into the Historic Environment and Cultural Heritage ES chapter, and will be presented as appendices to the ES.
Flood Risk and Hydrology	The Flood Risk and Hydrology ES chapter will consider the potential effects of the Proposed Development upon hydrology (including water quality, hydromorphology and groundwater) within the specified Study Area during the construction and decommissioning phases. It will also consider the potential effects of flood risk on the Proposed Development and as a result of the Proposed Development during within the specified Study Area during the construction, operation and decommissioning phases.
Socio-Economics	The Socio-Economic ES chapter will consider the potential effects of the Proposed Development upon employment, the local population, direct and indirect impacts on tourism, farming/ agriculture, and tourism supporting businesses within the specified Study Area during the construction, operation and decommissioning phases.
Land Use	The Land Use ES chapter will assess potential effects of the Proposed Development in terms of Agricultural Land Classification, land drainage, agri-environment schemes, Notifiable Scheduled Diseases and weeds (invasive species and injurious weeds) during the construction, operation and decommissioning phases.
Noise and Vibration	The Noise and Vibration ES chapter will consider the potential effects of noise during the construction phase of the Proposed Development.
Traffic and Transport	The Traffic and Transport ES chapter will consider the potential effects of the Proposed Development upon on the existing transport infrastructure within an agreed Study Area during the construction and decommissioning phases.
Electric and Magnetic Fields (EMFs)	The Electric and Magnetic Fields ES chapter will consider the potential effects (including cumulative effects) on public health from EMFs produced by the Proposed Development during the operational phase.
Cumulative Effects	The Cumulative Effects ES chapter will draw together and consider the potential effects of the Proposed Development upon the above environmental topics, cumulatively with the Associated Development, Related Development, and other relevant developments in the planning system.
Cross Disciplinary Cumulative Effects	The Cross Disciplinary Cumulative Effects Chapter of the ES will consider the potential for the individual impacts identified in the technical assessment to cause combined effects on individual receptors.

17.2 | Summary of EIA Scope – Issues to be Scoped Out	
Topic/ Issue	**Justification for Topic to be Scoped Out of the EIA**
Operational Water Quality and Groundwater	The occasional maintenance required during the operational lifetime of the Proposed Development will not result in significant effects on water quality and ground water. It is therefore proposed that this aspect be scoped out of the EIA.
Operational Traffic and Transport	There will be no transport effects during the operation/ maintenance phase. Therefore an assessment of this aspect is proposed to be scoped out of the EIA.
EMFs (construction/ decommissioning)	There will be no generation of EMFs during the construction and decommissioning phases. Therefore an assessment of this aspect is proposed to be scoped out of the EIA.
Noise and Vibration	The potential effects of noise as a result of the operation of the Proposed Development are not anticipated to be significant. Therefore an assessment of potential operational noise effects is proposed to be scoped out of the EIA. The potential effects of vibration during the construction, operation and decommissioning of the Proposed Development are expected to be negligible and are therefore proposed to be scoped out of the EIA process.
Air Quality	The potential effects of the generation of construction dusts or vehicle emissions/ particulate matter during the construction, operation and decommissioning of the Proposed Development are not anticipated to be significant. Therefore an assessment of potential air quality effects is proposed to be scoped out of the EIA.
Ground Conditions	The potential effects of the construction, operation and decommissioning of the Proposed Development upon ground conditions are not anticipated to be significant. Therefore an assessment of potential ground conditions effects is proposed to be scoped out of the EIA.
Civil and Military Aviation	The potential effects of the Proposed Development on civil and military aviation assets and operation during the construction, operation and decommissioning of the Proposed Development are not anticipated to be significant. Therefore an assessment of potential effects is proposed to be scoped out of the EIA.
Other Emissions	The potential effects of other emissions such as fuel/ oil spillages and leakages, mud and light pollution which might arise during the construction, operation and decommissioning of the Proposed Development are not anticipated to be significant. Therefore an assessment of their potential effects is proposed to be scoped out of the EIA.
Waste	The amount of waste that will be processed and removed from the site is anticipated to be minimal. Therefore an assessment of the potential effects of waste processing and removal is proposed to be scoped out of the EIA.
Contribution to Climate Change	The Proposed Development will not give rise to emissions or direct effects which could influence the climate. Therefore an assessment of the Proposed Development's contribution to climate change is proposed to be scoped out of the EIA.

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GLOSSARY

GLOSSARY AND ABBREVIATIONS	
132kV Overhead Line(s)	132,000 volts overhead lines which would be carried on wood pole structures (double and single) and steel towers above ground
33kV Neuadd Goch Bank overhead line	A 33kV overhead line in the Ty'n-y-waun area connecting the proposed Neuadd Goch Bank Wind Farm with the 132kV/ 33kV Neuadd Goch Bank Substation. A separate application for planning consent will be submitted in respect of this Associated Development component of the SP MWC Project
33kV overhead line	33,000 volts overhead line carried on single wood pole structures
132kV/ 33kV Neuadd Goch Bank substation	A new substation in the Ty'n-y-waun area connecting the 33kV overhead line with the CC1 Preferred Line Route Alignment. A separate application for planning consent will be submitted in respect of this Associated Development component of the SP MWC Project.
AES	Agro-environmental Scheme, providing funding to farmers and land managers to farm in a way that supports biodiversity, enhances the landscape, and improves the quality of water, air and soil
ALC	Agricultural Land Classification, classifying agricultural land in five categories according to versatility and suitability for growing crops
AONB	Areas of Outstanding Natural Beauty
ASIDOHL	Assessment of the Impact of the Development on the Historic Landscape
SP Manweb	SP Manweb plc.
Associated Development	Associated Development comprises: the 33kV Neuadd Goch Bank overhead line; 132kV/ 33kV Neuadd Goch Bank substation; and the associated construction works and accesses. The Associated Development does not form part of the Nationally Significant Infrastructure Project and consent for it is not being applied for as part of the application for development consent under the Planning Act 2008
BAP	Biodiversity Action Plan
BGS	British Geological Survey
BNC Preferred Line Alignments	The route of the indicative centre line alignments of the 132kV Overhead Lines that would sit within the BNC Preferred Line Route Alignments

GLOSSARY AND ABBREVIATIONS	
BNC Preferred Line Route Alignments	The approximately 100 m wide corridors containing the BNC Preferred Line Alignments (the red section), including the connections from the proposed Dyfnant Forest (BNC1), Mynydd Lluest y Graig (BNC2), Llanbrynmair (BNC3) and Carnedd Wen (BNC4) Wind Farms to a shared tower line (BNC5) and then into the proposed NG substation
BNC Preferred Line Route Alignment Section	A section of the BNC Preferred Line Route Alignment: BNC1; BNC2; BNC3; BNC4 and BNC5
Broad Route Corridors	The route corridors announced at Stage One of SP Manweb's consultation process
BSC Preferred Line Alignment	The route of the indicative centre line alignment of the 132kV Overhead Lines that would sit within the BSC Preferred Line Route Alignment
BSC Preferred Line Route Alignment	The approximately 100 m wide corridors containing the BSC Preferred Line Alignment (the blue section), including the connections from the proposed Carno III Wind Farm and then into the proposed NG substation
BTO	British Trust for Ornithology
c.	circa/ approximately
cable	Underground electrical circuit
Cadw	Welsh Government's historic environment service
CC Preferred Line Alignments	The route of the indicative centre line alignments of the 132kV Overhead Lines that would sit within the CC Preferred Line Route Alignments
CC Preferred Line Route Alignments	The approximately 100 m wide corridors containing the CC Preferred Line Alignments (the green section), including the connections from the proposed Llanbadarn Fynydd and Llaithddu Wind Farms and then into the proposed NG substation
CC Preferred Line Route Alignment Section	A section of the CC Preferred Line Route Alignment: CC1, CC2 and CC4
CEGB	Central Electricity Generating Board
CHA	Cultural Heritage Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CLVIA	Cumulative Landscape and Visual Impact Assessment
CMS	Construction Method Statement

GLOSSARY AND ABBREVIATIONS	
circuit	An electrical connection between two or more points. The circuit can comprise of a mixture of components including underground cables, overhead lines, reactors, transformers and switchgear
cSAC	Candidate Special Area od Conservation
conductor	The overhead wires used to carry the electrical current. These wires are generally un-insulated and are supported by insulators. The conductor material is typically an aluminium alloy or aluminium with steel reinforcement that, on a 132kV circuit, can comprise a 175 mm size termed 'Poplar', a 200 mm size termed 'Lynx', and a 300 mm size termed 'UPAS'
Consultation Area	The 'Consultation Area', for the statutory consultation process, includes areas directly affected by the SP MWC Project which are wholly within the Powys County Council area as well as indirectly affected areas beyond where people may work and live but have reason to travel through the directly affected areas. The geographical extent of the Consultation Area includes the following Community Council areas: Abbey Cwmhir, Banwy, Beguildy, Caersws, Carno, Dwyriw, Kerry, Llanbadarn (Fynydd), Llanbrynmair, Llandinam, Llanerfyl, Llanfair Caereinion, Llangurig, Llanidloes, Llanidloes Without, Mochdre, St Harmon and Trefeglwys. A map of the Consultation Zone can be found in the Revised Consultation Strategy (September 2013)
Contracted Wind Farms	Eight wind farms that have agreed terms and a contract with SP Manweb for a connection into the electricity network. The eight wind farms are referred to as: Dyfnant Forest, Mynydd Lluest y Graig, Llanbrynmair, Carnedd Wen, Carno III, Llanbadarn (Fynydd), Neuadd Goch Bank and Llaithddu.
CPAT	Clwyd-Powys Archaeological Trust
cumulative effects	Effects that accrue over time and space from a number of development activities including permitted application(s) that are not yet implemented and submitted application(s) that are not yet determined
CZTV	Cumulative Zone of Theoretical Visibility
dB(A)	The unit of noise measurement (Measured on a logarithmic scale), which expresses the loudness in terms of decibel (dB) scale and the frequency factor (A)
DCO	Development Consent Order – the consent required for nationally significant infrastructure projects under the Planning Act 2008 (and its subsidiary legislation)
DECC	Department of Energy and Climate Change

GLOSSARY AND ABBREVIATIONS	
decibel (dB)	The unit normally employed to measure the magnitude of sound
Defra	UK Government's Department for Environment, Food and Rural Affairs
decommissioning	The process of terminating the distribution of electricity along the Proposed Development upon cessation of its operational lifetime
DNO	Distribution Network Operator. SP Manweb is the DNO for North and Mid Wales, Cheshire and Merseyside
DRMB	Design Manual for Roads and Bridges
DSM	Digital Surface Model
EcIA	Ecological Impact Assessment
Earth wire	A conductor which permits the passage of fault current
EIA	Environmental Impact Assessment – a statutory process whereby the likely significant environmental effects of the Proposed Development are assessed through the collection and consideration of environmental information. The findings are published in an Environmental Statement
EIA Regulations	Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended)
EIA Scoping Report (this document)	A report setting out the proposed scope of the Environmental Impact Assessment and requesting the opinion of the Secretary of State on the same
EIA Study Area	The area over which there may be significant environmental effects. EIA Study Areas are defined for each EIA discipline (and sub-topics therein) and based upon the Indicative DCO Site Boundary plus (as required) an appropriate topic-specific spatial buffer
ELF	Extremely Low Frequency
EMF	Electromagnetic fields generated by electricity
ERPI	Electric Power Research Institute
ES	Environmental Statement – the published documentation containing the findings of an EIA
fault current	Electrical current which flows as a result of a fault on the electrical network
fibre optic	A glass fibre used for use in communications systems
GIS	Geographical Information System

GLOSSARY AND ABBREVIATIONS	
GLVIA	Guidelines for Landscape and Visual Assessment Impact Assessment – 3rd Edition
GPS	Geographical Positioning System
GTA	Guidelines for Transport Assessment
GVA	Gross Value Added
GW	Gigawatt (1,000 Megawatts)
HCA	Homes and Communities Agency
HDWP design	Heavy Duty Wood Pole design – a two wood pole structure (which extends to approximately 14 m high above ground level) with steel bracing and approximately 2 m high gantry onto which are fitted insulators and the conductors
HEGS	Hedgerow Evaluation and Grading Systems
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
the Holford Rules	A series of planning guidelines for the routeing of overhead lines first developed in 1959 by Lord Holford, adviser to the then Central Electricity Generating Board on amenity issues. They were reviewed in the 1990s by National Grid.
HPA RPD	Health Protection Agency's Radiation Protection Division
HRA	Habitat Regulations Assessment
ICNIRP	International Commission on Non-Ionizing Radiation Protection
in-combination effects	The combined impact of the cross disciplinary effects on a single receptor
Indicative DCO Site Boundary	The DCO application site boundary for the Proposed Development, which will be confirmed following the completion of statutory consultation under the Planning Act 2008 (and its subsidiary legislation). This will encompass the Proposed Line Route Alignments and any land required for construction, access and mitigation in order to deliver the Proposed Development
insulators	Insulators are used in electrical equipment to support and separate conductors without allowing current through themselves
IEMA	Institute of Environmental Assessment
IfA	Institute for Archaeologists

GLOSSARY AND ABBREVIATIONS	
kV	Kilovolts (1,000 volts)
km	kilometre
LAeq	This is the continuous equivalent sound level, adjusted to replicate the sensitivity of human hearing. It is a widely used noise parameter that calculates a constant equivalent noise level over a specified period
LANDMAP	Natural Resources Wales have developed LANDMAP as a tool to assess the diversity of all landscapes within Wales, identifying and explaining their characteristics and qualities
LDP	Local Development Plan
LiDAR	A remote sensing technology that utilises lasers to measure distances; it is commonly used to make high resolution maps.
Local Planning Authority	Local decision maker for planning applications under the Town and Country Planning Act 1990, in this case Powys County Council (PCC)
LUC	Land Use Consultants (a company)
LVIA	Landscape and Visual Impact Assessment
line rating	The maximum power a circuit or component of a circuit can safely carry. This will be determined by a number of factors including the design rating of the component and its electrical clearance distance. For an overhead line conductor temperature will be affected by the heating effect of the electrical current and the ambient temperature. In summer months the heating effect is at its greatest and the conductor will sag more than in winter (for the same electric current loading). The rating in summer is therefore a lower figure than for winter to ensure that the sag does not encroach on the statutory clearance distances.
m	metre
MAGIC	Defra's geographical information website
mm/hr	millimetres per hour
mAOD	metres above ordnance datum
MHRA	Medicines and Healthcare Products Regulatory Agency
mitigation	Measures to prevent, reduce and where possible offset significant adverse environmental effects

GLOSSARY AND ABBREVIATIONS	
MVA	Mega Volt Amperes is the Apparent Power and is the three phase vector summation of the Real Power (MW) and Reactive Power (MVAr) calculated as 1,000 x √3 x Line Voltage (kV) x Line Current (A).
MW	Megawatts (1,000 watts) – energy generated by wind farms is described in MW - the Real Power or Active Power and is equivalent to 1,000,000 Watts
MWT	Montgomeryshire Wildlife Trust
Nationally Significant Infrastructure Project (NSIP)	Large infrastructure projects designated as 'Nationally Significant Infrastructure Projects' under the terms of the Planning Act 2008 (and its subsidiary legislation) that are considered to support the economy and vital public services. Such projects need to obtain development consent from the Secretary of State under the Planning Act 2008
Natura 2000	International network of protected areas within the European Union for the conservation of habitats and species diversity
NETS	National Electricity Transmission System
NG	National Grid
NGR	National Grid Reference
NPS	National Policy Statements designated under the Planning Act 2008 (and its subsidiary legislation), which set out Government policy for particular types of NSIP projects
NRW	Natural Resources Wales
NTS	Non-Technical Summary – a document that provides a summary of the key issues and findings of an EIA
NVC	National Vegetation Classification
Ofgem	The Office of the Gas and Electricity Markets – the regulator for the UKs gas and electricity industries whose role is to promote choice and value for customers
OHL	Overhead Line
OS	Ordnance Survey
Palaeo-environment	An environment at a period in the geological past.
PBBNP	Powys and Brecon Beacons National Park
PBG	Powys/ Radnorshire Badger Group
PCC	Powys County Council

GLOSSARY AND ABBREVIATIONS	
PEI Report	Preliminary Environmental Information Report – the preliminary assessment of the likely significant environmental effects of the Proposed Development which are reported in the PEI Report for the purposes of statutory consultation. The PEI Report for the Proposed Development will be published during Stage Five consultation in Autumn 2014
Permitted Development	Statutory Undertakers such as SP Manweb have certain permitted development rights under The Town and Country Planning (General Permitted Development) Order 1995
PINS	Planning Inspectorate – the body responsible for operating the planning process for NSIP projects. PINS examines the application and will make a recommendation to the Secretary of State for Energy and Climate Change who will make the decision on whether to grant or refuse development consent for the Proposed Development
Planning Act 2008 (and its subsidiary legislation)	The legislation which sets out the process for an application for a Development Consent Order and defines Nationally Significant Infrastructure Projects.
PPW	Planning Policy Wales (Edition 6, February 2014).
Preferred Route Corridors	The Preferred Route Corridor(s), comprising BNC, BSC and CC – announced following Stage Two Consultation of SP Manweb's consultation process.
Preferred Route Corridor BNC	The initial (Stage Two) northern strategic corridor identified for the SP MWC Project (the red corridor within SSA B), connecting the proposed Dyfnant Forest, Mynydd Lluest y Graig, Llanbrynmair and Carnedd Wen Wind Farms into the proposed NG substation.
Preferred Route Corridor BSC	The initial (Stage Two) western strategic corridor identified for the SP MWC Project (the blue corridor within SSA B), connecting the proposed Carno III Wind Warm into the proposed NG substation.
Preferred Route Corridor CC	The initial (Stage Two) southern strategic corridor identified for the SP MWC Project (the green corridor within SSA C), connecting the proposed Llanbadarn Fynydd, Llaithddu, and Neuadd Goch Bank Wind Farms to the proposed NG substation.
Preferred Line Alignments	The route of the indicative centre line alignments of the 132kV Overhead Lines that would sit within the Preferred Line Route Alignments
Preferred Line Route Alignments	The approximately 100 m wide corridors containing the Preferred Line Alignments
Prescribed Consultees	Organisations designated under the Planning Act 2008 (and its subsidiary legislation) that are consulted by PINS and SP Manweb on the application for a DCO for the Proposed Development.

GLOSSARY AND ABBREVIATIONS	
Proposed Development	The NSIP development to which this EIA Scoping Report relates
Proposed Line Route Alignments	The approximately 100 m wide Line Routes which, following consultation and technical and environmental appraisal, will be confirmed. SP Manweb will request in its application for development consent for the Proposed Development that the Proposed Line Alignments can be flexibly positioned and moved within this approximately 100m width. These Proposed Line Route Alignments will form the basis of the submission of an application for development consent for the Proposed Development. The Proposed Line Route Alignments may differ from the Preferred Line Route Alignments following consultation and environmental and technical appraisal.
Proposed Line Alignments	The route of the indicative line alignments of the 132kV Overhead Lines that would sit within the Proposed Line Route Alignments. The Proposed Line Alignments may differ from the Preferred Line Alignments following consultation and environmental and technical appraisal.
proposed NG 400kV connection	400kV National Grid overhead connection for onward transmission from the proposed NG substation to the national electricity transmission system
proposed NG substation	400kV/ 132kV National Grid substation proposed at Cefn Coch. Subject to a separate planning application for consent by National Grid
pSPA	Proposed Special Protection Area
Related Development	The eight wind farm developments and the National Grid development proposals (the proposed NG 400kV connection and the proposed NG substation)
RCAHMW	Royal Commission on Ancient and Historical Monuments in Wales
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SAGE	Stakeholder Advisory Group on Extremely Low Frequency Electromagnetic Fields
SER	Strategic Environmental Report
SoCC	Statement of Community Consultation – a description of how SP Manweb intends to consult the community on the SP MWC Project pursuant to s47 of the Planning Act 2008 (and its subsidiary legislation)

GLOSSARY AND ABBREVIATIONS	
SOR	Strategic Options Report – sets out the initial technical options for the project, an appraisal of each option identifying the preferred technical option for the project. Various SORs have been released by SP Manweb to date as part of its consultation process. These can be found at http://www.spmidwalesconnections.info/english/downloads/
SP	ScottishPower
SPA	Special Protection Area
SPEN	ScottishPower Energy Networks
SP Manweb	SP Manweb plc - The DNO for North and Mid Wales, Cheshire and Merseyside. The promoter of the SP MWC Project.
SP MWC Project	ScottishPower Mid Wales Connections Project
SPZ	Source Protection Zone
SSA	Strategic Search Area
SSSI	Site of Special Scientific Interest
STEAM	Scarborough Tourism Economic Activity Monitor
steel tower	Steel towers used to support a double circuit overhead electricity line.
Statutory Consultees	Organisations that SP Manweb is required to consult by virtue of the Planning Act 2008 (and its subsidiary legislation)
Statutory Undertakers	Companies with regulatory powers and duties, such as gas, electricity, water and transport providers/ transmitters
Suggested Line Routes	The routes announced in Stage Three Consultation of SP Manweb's consultation process.
substation	Generated electricity is fed into the electricity distribution network through substations. Substations control the flow of power through the network by means of transformers and switchgear, with facilities for control, fault protection and communications
Study Area	The defined area within which each technical discipline will assess the likely significant effects. Study areas are 'topic-specific' and each is defined in the relevant technical section of this EIA Scoping Report. The study areas will be refined as necessary in line with the Proposed Line Route Alignments for the purposes of the Preliminary Environmental Information Report and the Environmental Statement
TAN	Welsh Government Technical Advice Note

GLOSSARY AND ABBREVIATIONS	
terminal point	Location at which the overhead line stops and transfers to an underground cable. The cable will run down the terminal pole underground. No sealing end compounds are required for the Proposed Development
Trident	The "Trident" 132kV wood pole design is typically a single wood pole support comprising 3 conductors. The wood poles used in a Trident line are approximately 13m high with spans varying between 90m to 130m. The maximum span length that can be achieved is 150m.
UDP	Unitary Development Plan
undergrounding	Electricity cables laid underground in a 1 m x 1 m open cut trench per circuit
V/m	Volts per metre
Voltage (volts)	Unit of measure of electrical potential difference
WG	Welsh Government
wayleave	a form of licence, a contract between two parties that provides for one party's rights across land of the other party
WebTAG	Web-based Transport Analysis Guidance
WFD	Water Framework Directive (Directive 2000/60/EC)
wood pole	Wooden pole used to support a single or double circuit overhead electricity line. In the case of the Proposed Development, this may be of either Heavy Duty Wood Pole or Trident design, with work ongoing to determine which design may be used for the different sections of the Proposed Development.
WSI	Written Scheme of Investigations
WSP	Wales Spatial Plan
XLPE cable	Cross-linked polyethylene cable
ZTV	Zone of Theoretical Visibility

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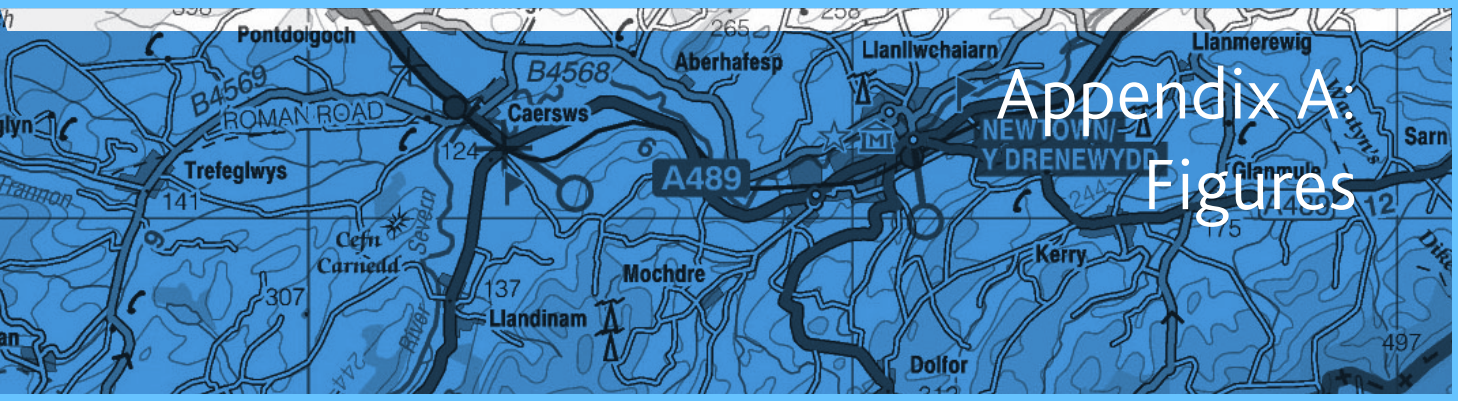

Appendix A: Figures

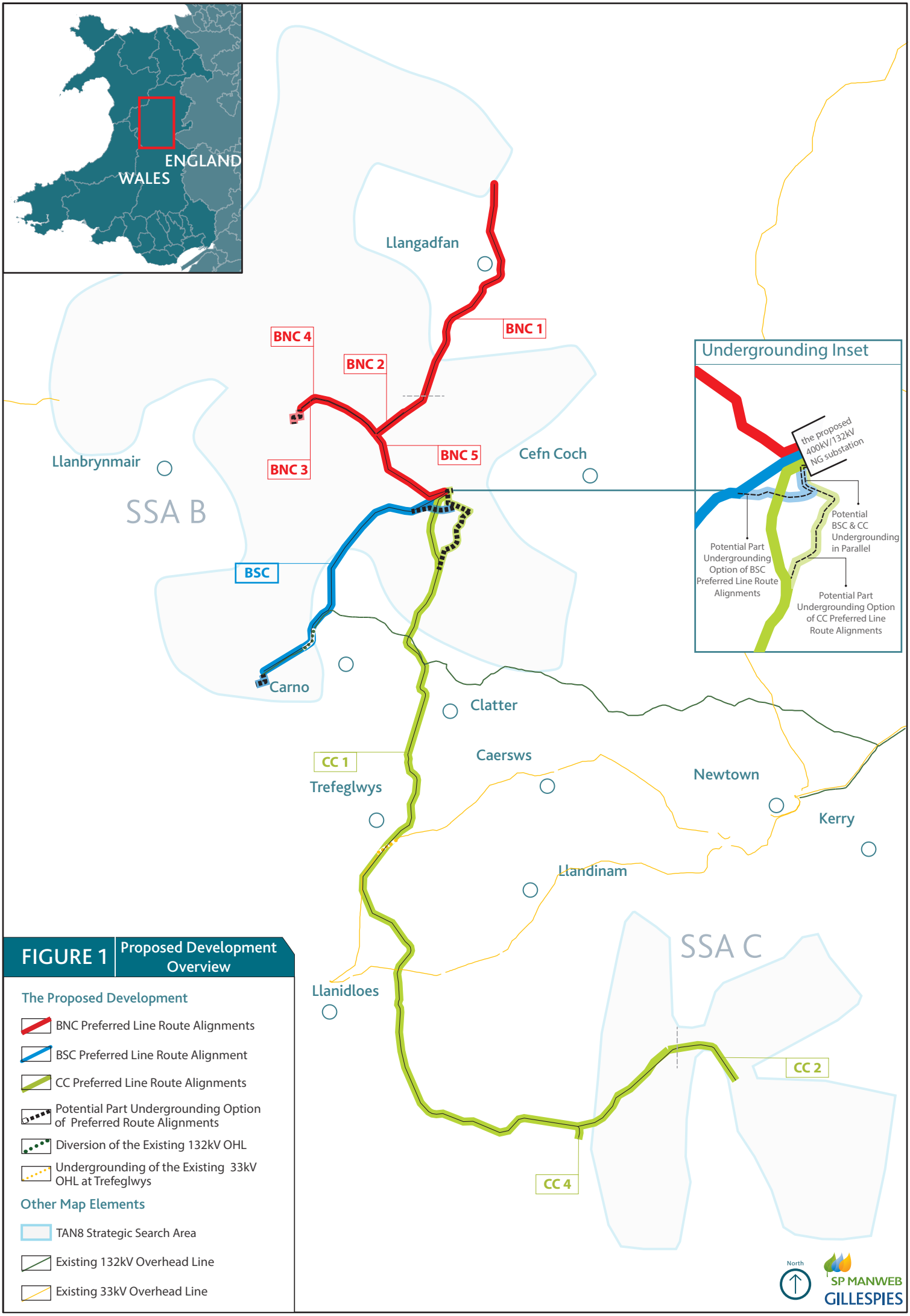
ENGLAND
WALES
Llangadfan
BNC 1
BNC 4
BNC 2
BNC 5
BNC 3
Llanbrynmair
Cefn Coch
SSA B
BSC
Carno
Clatter
CC 1
Trefeglwys
Caersws
Newtown
Kerry
Llandinam
Llanidloes
SSA C
CC 2
CC 4
Undergrounding Inset
the proposed 400kV/132kV NG substation
Potential BSC & CC Undergrounding in Parallel
Potential Part Undergrounding Option of BSC Preferred Line Route Alignments
Potential Part Undergrounding Option of CC Preferred Line Route Alignments
FIGURE 1
Proposed Development Overview
The Proposed Development
BNC Preferred Line Route Alignments
BSC Preferred Line Route Alignment
CC Preferred Line Route Alignments
Potential Part Undergrounding Option of Preferred Route Alignments
Diversion of the Existing 132kV OHL
Undergrounding of the Existing 33kV OHL at Trefeglwys
Other Map Elements
TAN8 Strategic Search Area
Existing 132kV Overhead Line
Existing 33kV Overhead Line
North
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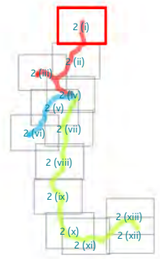
FIGURE 2

Layout i of (xiii)

The Proposed Development



- Preferred Line Alignment
- Undergrounding of Preferred Line Alignment
- BNC Preferred Line Route Alignments
- Potential Undergrounding of BNC Preferred Line Route Alignments
- BSC Preferred Line Route Alignment
- Potential Part Undergrounding Option of BSC Preferred Line Route Alignment
- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Construction Area
- Construction Access
- Draft Construction Laydown Area
- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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North

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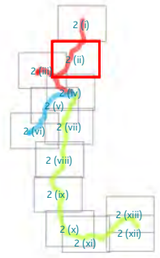
FIGURE 2

Layout ii of (xiii)

The Proposed Development



- Preferred Line Alignment
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- BNC Preferred Line Route Alignments
- Potential Undergrounding of BNC Preferred Line Route Alignments
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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Construction Area
- Construction Access
- Draft Construction Laydown Area
- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

SP MANWEB GILLESPIES

North

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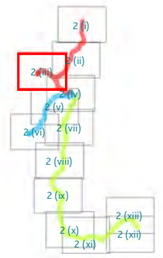
FIGURE 2

Layout iii of (xiii)

The Proposed Development



- Preferred Line Alignment
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- BNC Preferred Line Route Alignments
- Potential Undergrounding of BNC Preferred Line Route Alignments
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- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
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- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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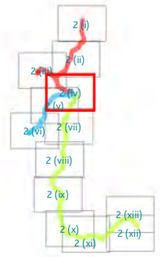
FIGURE 2

Layout iv of (xiii)

The Proposed Development



- Preferred Line Alignment
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- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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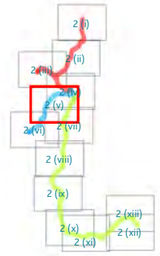
FIGURE 2

Layout v of (xiii)

The Proposed Development



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- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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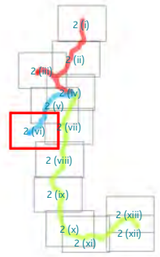
FIGURE 2

Layout vi of (xiii)

The Proposed Development



- Preferred Line Alignment
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Other Map Elements

Existing SP Distribution Network

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Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

SP MANWEB

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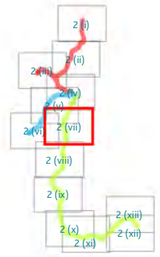
FIGURE 2

Layout vii of (xiii)

The Proposed Development



- Preferred Line Alignment
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Associated Development

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SP MANWEB GILLESPIES

North

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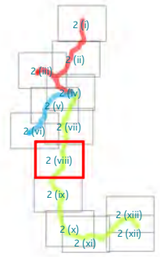
FIGURE 2

Layout viii of (xiii)

The Proposed Development



- Preferred Line Alignment
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Associated Development

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SP MANWEB

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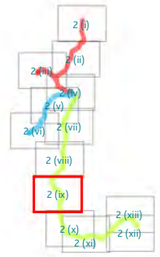
FIGURE 2

Layout ix of (xiii)

The Proposed Development



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- Indicative DCO Site Boundary

Other Map Elements

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- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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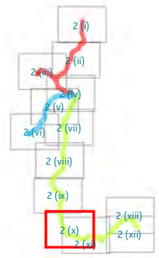
FIGURE 2

Layout x of (xiii)

The Proposed Development



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- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

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- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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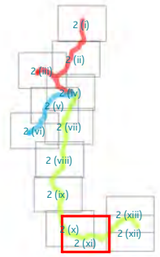
FIGURE 2

Layout xi of (xiii)

The Proposed Development



- Preferred Line Alignment
- Undergrounding of Preferred Line Alignment
- BNC Preferred Line Route Alignments
- Potential Undergrounding of BNC Preferred Line Route Alignments
- BSC Preferred Line Route Alignment
- Potential Part Undergrounding Option of BSC Preferred Line Route Alignment
- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Construction Area
- Construction Access
- Draft Construction Laydown Area
- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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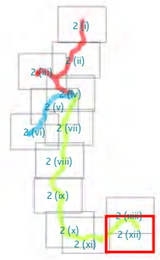
FIGURE 2

Layout xii of (xiii)

The Proposed Development



- Preferred Line Alignment
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- BSC Preferred Line Route Alignment
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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Construction Area
- Construction Access
- Draft Construction Laydown Area
- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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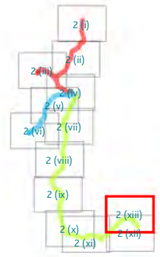
FIGURE 2

Layout xiii of (xiii)

The Proposed Development



- Preferred Line Alignment
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- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Construction Area
- Construction Access
- Draft Construction Laydown Area
- Diversion of the Existing 132kV OHL
- Undergrounding of the Existing 33kV OHL at Trefeglwys
- Indicative DCO Site Boundary

Other Map Elements

Existing SP Distribution Network

- Existing 132kV Overhead Line
- Existing 33kV Overhead Line

Associated Development

- 33kV Neuadd Goch Bank Overhead Line
- 33kV/132kV Neuadd Goch Bank Substation

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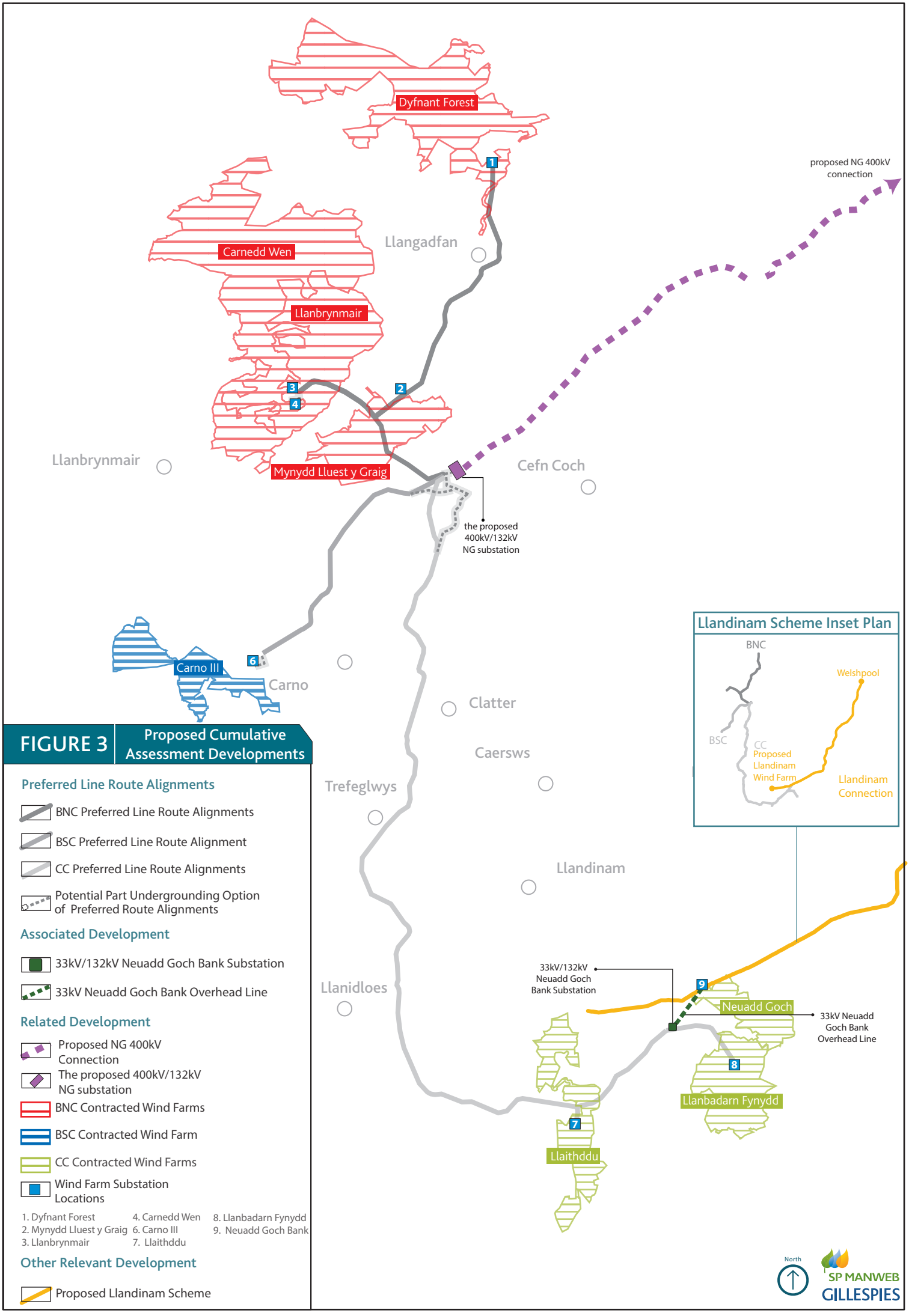

FIGURE 3 Proposed Cumulative Assessment Developments

Preferred Line Route Alignments

- BNC Preferred Line Route Alignments
- BSC Preferred Line Route Alignment
- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of Preferred Route Alignments

Associated Development

- 33kV/132kV Neuadd Goch Bank Substation
- 33kV Neuadd Goch Bank Overhead Line

Related Development

- Proposed NG 400kV Connection
- The proposed 400kV/132kV NG substation
- BNC Contracted Wind Farms
- BSC Contracted Wind Farm
- CC Contracted Wind Farms
- Wind Farm Substation Locations

1. Dyfnant Forest
2. Mynydd Lluest y Graig
3. Llanbrynmair
4. Carnedd Wen
6. Carno III
7. Llaithddu
8. Llanbadarn Fynydd
9. Neuadd Goch Bank

Other Relevant Development

- Proposed Llandinam Scheme

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FIGURE 4A | CONSTRAINTS OVERVIEW

North

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Preferred Line Route Alignments

- BNC Preferred Line Route Alignments
- Potential Undergrounding of BNC Preferred Line Route Alignments
- BSC Preferred Line Route
- Potential Part Undergrounding Option of BSC Preferred Line Route Alignments
- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
- Special Protection Area
- Special Area of Conservation
- Site of Special Scientific Interest (SSSI)
- Wind farm Habitat Management Plan

Historic Environment

- Undesignated Archaeology Sites
- Listed Buildings
- Conservation Area
- Historic Park and Garden
- Scheduled Ancient Monument
- Welsh Historic Landscape (WHL)

Landscape and Visual Amenity

- Residential Property (within 2km from alignment)
- National/Regional Trail
- National/Regional Cycle Link
- Caravan Sites
- Recreation Points
- Ridge Line
- Recreation and Visitor
- AONB
- National Park

Forestry and Woodland

- National Forest Estate
- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland
- Restored Ancient Woodland

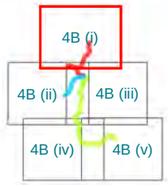
Technical and Cumulative Infrastructure

- Flood Zone
- Existing 33kV Overhead Line
- Existing 132kV Overhead Line
- Existing 400kV Overhead Line
- Proposed Llandinam Scheme
- Preferred Carno Route Alignment (Cable End)
- Consented Tirgwynt OHL
- TAN8 Strategic Search Area
- Wind Farm Boundary
- Existing and Proposed Turbine
- Private Airstrip Flight Path
- 33kV/132kV Neuadd Goch Bank Substation
- 33kV OHL from Neuadd Goch Bank Wind Farm
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

FIGURE 4B

Layout i (of v)

Ecology and Historic Environment Constraints



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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Wind Farm Habitat Management Plan

Historic Environment

- Listed Buildings
- Undesignated Archaeology Sites
- Conservation Area
- Historic Park and Garden
- Welsh Historic Landscape (WHL)
- Scheduled Ancient Monument (SAM)

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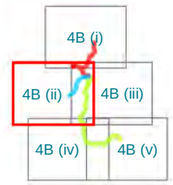
FIGURE 4B

Layout ii (of v)

Ecology and Historic Environment Constraints



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- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- Wind Farm Habitat Management Plan

Historic Environment

- Listed Buildings
- Undesignated Archaeology Sites
- Conservation Area
- Historic Park and Garden
- Welsh Historic Landscape (WHL)
- Scheduled Ancient Monument (SAM)

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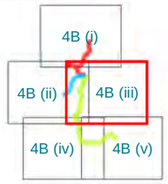
FIGURE 4B

Layout iii (of v)

Ecology and Historic Environment Constraints



Preferred Line Route Alignments

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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
- Special Protection Area (SPA)
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- Wind Farm Habitat Management Plan

Historic Environment

- Listed Buildings
- Undesignated Archaeology Sites
- Conservation Area
- Historic Park and Garden
- Welsh Historic Landscape (WHL)
- Scheduled Ancient Monument (SAM)

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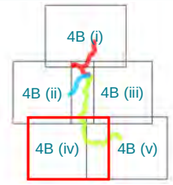
FIGURE 4B

Layout iv (of v)

Ecology and Historic Environment Constraints



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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
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Historic Environment

- Listed Buildings
- Undesignated Archaeology Sites
- Conservation Area
- Historic Park and Garden
- Welsh Historic Landscape (WHL)
- Scheduled Ancient Monument (SAM)

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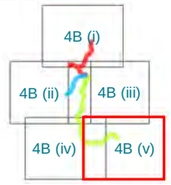
FIGURE 4B

Layout v (of v)

Ecology and Historic Environment Constraints



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- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Ecology

- Local Wildlife Site (LWS)
- Montgomeryshire Wildlife Trust nature reserve (WTNR)
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
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Historic Environment

- Listed Buildings
- Undesignated Archaeology Sites
- Conservation Area
- Historic Park and Garden
- Welsh Historic Landscape (WHL)
- Scheduled Ancient Monument (SAM)

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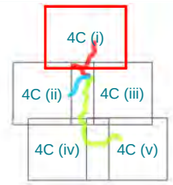
FIGURE 4C

Layout i (of v)

Landscape, Visual, Woodland and Flood Risk Constraints



Preferred Line Route Alignments

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- Potential Part Undergrounding Option of BSC Preferred Line Route Alignment
- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Landscape and Visual Amenity

- National/Regional Trail
- National/Regional Cycle Link
- Caravan Sites
- Recreation Points
- Residential Property (within 2km from route)
- Ridge Line
- Recreation and Visitor Attraction
- AONB
- National Park

Forestry and Woodland

- National Forest Estate
- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Flood Risk

- Flood Zone

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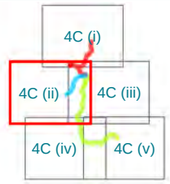
FIGURE 4C

Layout ii (of v)

Landscape, Visual, Woodland and Flood Risk Constraints



Preferred Line Route Alignments

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- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Landscape and Visual Amenity

- National/Regional Trail
- National/Regional Cycle Link
- Caravan Sites
- Recreation Points
- Residential Property (within 2km from route)
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- Recreation and Visitor Attraction
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- National Park

Forestry and Woodland

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- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Flood Risk

- Flood Zone

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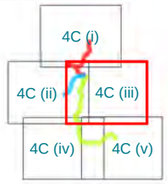
FIGURE 4C

Layout iii (of v)

Landscape, Visual, Woodland and Flood Risk Constraints



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- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Landscape and Visual Amenity

- National/Regional Trail
- National/Regional Cycle Link
- Caravan Sites
- Recreation Points
- Residential Property (within 2km from route)
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- AONB
- National Park

Forestry and Woodland

- National Forest Estate
- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Flood Risk

- Flood Zone

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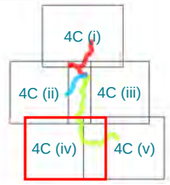
FIGURE 4C

Layout iv (of v)

Landscape, Visual, Woodland and Flood Risk Constraints



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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignments
- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Landscape and Visual Amenity

- National/Regional Trail
- National/Regional Cycle Link
- Caravan Sites
- Recreation Points
- Residential Property (within 2km from route)
- Ridge Line
- Recreation and Visitor Attraction
- AONB
- National Park

Forestry and Woodland

- National Forest Estate
- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Flood Risk

- Flood Zone

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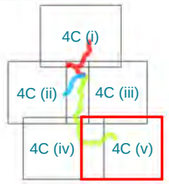
FIGURE 4C

Layout v (of v)

Landscape, Visual, Woodland and Flood Risk Constraints



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- Indicative DCO Site Boundary
- 5km from Preferred Line Route Alignments
- 10km from Preferred Line Route Alignments

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Landscape and Visual Amenity

- National/Regional Trail
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Forestry and Woodland

- National Forest Estate
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- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Flood Risk

- Flood Zone

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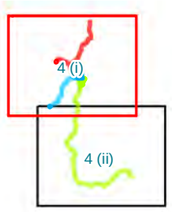
FIGURE 5

Layout i (of ii)

Draft Viewpoint Locations



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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignment

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Draft Viewpoints

- Selected Viewpoints (Draft)*

*Refer toAppendix C for a Schedule of Viewpoint Locationss

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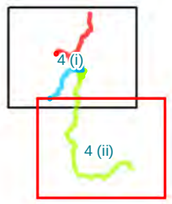
FIGURE 5

Layout ii (of ii)

Draft Viewpoint Locations



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Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

Draft Viewpoints

- Selected Viewpoints (Draft)*

*Refer toAppendix C for a Schedule of Viewpoint Locationss

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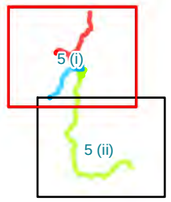
FIGURE 6

Layout i (of ii)

LANDMAP 'Outstanding' Evaluations



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- CC Preferred Line Route Alignments
- Potential Part Undergrounding Option of CC Preferred Line Route Alignment

Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

LANDMAP 'Outstanding' Evaluations

- Cultural Landscape
- Geological Landscape
- Historic Landscape
- Landscape Habitats
- Visual Sensory

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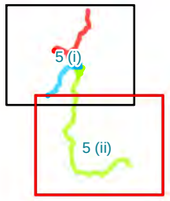
FIGURE 6

Layout ii (of ii)

LANDMAP 'Outstanding' Evaluations



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Associated Development

- 33kV OHL from Neuadd Goch Bank Wind Farm

LANDMAP 'Outstanding' Evaluations

- Cultural Landscape
- Geological Landscape
- Historic Landscape
- Landscape Habitats
- Visual Sensory

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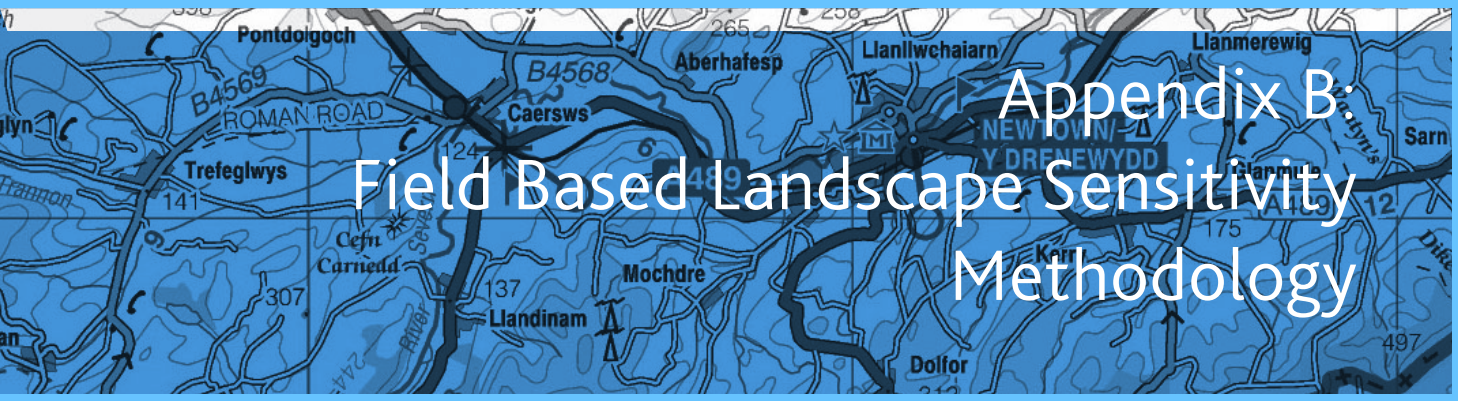


Appendix B: Field Based Landscape Sensitivity Methodology

CONTENTS

METHODOLOGY FOR ASSESSING FIELD-BASED SENSITIVITY OF LANDSCAPE TO 132KV OVERHEAD LINES

1 INTRODUCTION

Background to the Appraisal

SP Manweb, as part of the Mid Wales Connections Project, undertook a field based landscape sensitivity appraisal for the route corridor options being considered at the time. The output of this appraisal which was detailed in their March 2012 document, '*SP Mid Wales Connections Field-Based Landscape Sensitivity in Relation to Overhead Lines*' helped inform the route corridor identification and comparative appraisal process.

As part of the formal environmental impact assessment (EIA) the appraisal will be revisited to ensure that it responds to the most up to date project design. The output will form the basis for the subsequent landscape assessment and will help inform the identification of mitigation measures. Further more detailed survey work will be undertaken to supplement data gathered as part of the ongoing detailed routeing process.

This document sets out the methodology for the appraisal which has been updated since 2012 both to reflect publication of GLVIA3 and to ensure that it responds to emerging guidance on assessing the value of undesignated landscapes. At the request of Natural Resources Wales (NRW), to ensure a consistent approach across other major linear infrastructure projects in Wales, it has been developed alongside National Grid's field based sensitivity appraisal for its 400kV overhead line. Both NRW and Powys County Council (PCC) have been involved in developing the approach through a meeting held in April 2014.

Whilst the previous methodology followed the approach set out in '*Topic Paper 6*[1]: *Techniques and Criteria for Judging Capacity and Sensitivity*', published by Scottish Natural Heritage and the Countryside Agency in 2006, NRW[2] have advised that this has now been superseded by advice contained in the '*Guidelines for Landscape and Visual Impact Assessment, Third Edition*' (GLVIA3), published by the Landscape Institute and IEMA.

The aim of the appraisal remains the assessment of the relative sensitivity of the Mid Wales landscape to new 132kV overhead lines. The principal judgement it seeks to make is whether the landscape can satisfactorily accommodate a 132kV overhead line without having unacceptable adverse effects on its character, the way that it is seen or perceived, and without compromising the values attached to it.

Type of Development being considered

Sensitivity is determined, not only by the particular aspects of the landscape likely to be affected by the change, but also by the exact form and nature of the change likely to take place. For each of the proposed grid connections (BSC, BNC and CC), the appraisal will therefore consider the sensitivity of the landscape to the particular type of overhead line support structure being considered:

- *Heavy Duty Wood Poles (double poles approximately 14 m high);*
- *Trident Wood Poles (single poles approximately 12 m high); and*
- *L7 Steel Lattice Towers (approximately 26 m high).*

The same criteria will apply irrespective of which support structure is used although it is recognised that most landscapes will typically be less sensitive to the introduction of wood pole lines, particularly those supported by the Trident design, than they would be to steel towers.

1 Scottish Natural Heritage and the Countryside Agency (2006). 'Techniques and Criteria for Judging Capacity and Sensitivity'.
2 Personal communication

Definition of Landscape Character and Sensitivity

GLVIA3 (Glossary pages 157-158) defines landscape character and sensitivity as follows:

- **Landscape character is** *"a distinct and recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse."*
- **Sensitivity is a** *"term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor."*

Landscape sensitivity to 132kV overhead line development is essentially the extent to which the landscapes of the area through which the proposed overhead lines will pass are vulnerable to change arising from this specific development. The underlying premise is that landscapes of lower sensitivity will have more scope to accommodate an overhead line than landscapes of higher sensitivity. Landscapes which are highly sensitive are at risk of having their key characteristics fundamentally altered potentially leading in extreme cases to a different landscape character.

Landscape Sensitivity

The sensitivity of the landscape to change arising from overhead lines is assessed by considering the following two factors:

- *Susceptibility to change; and*
- *Value.*

Susceptibility to change

Susceptibility to change is defined by GLVIA3 as:

"the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular landscape type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences for the maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies". Para 5.40

Many factors contribute to the susceptibility of the landscape to the development of 132kV overhead lines. Each landscape has its own key characteristics or combinations of elements and features which define its character and help to give an area its particular characteristics or sense of place and each of these characteristics can have different susceptibilities to the type of change likely to arise.

Value

Landscape value is the relative value that is attached to different landscapes by society and is independent of any development proposal. It is defined by GLVIA3 as:

"the relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons…Landscapes or their component parts may be valued at the community, local, national or international levels…" para. 5.19

As with susceptibility, value can apply to the landscape as a whole, to its individual elements and/or features, or to its particular aesthetic or perceptual aspects.

Whilst the usual basis for recognising highly valued landscapes is through the application of statutory landscape designations or local landscape designations and associated policies, the absence of designation does not necessarily imply that a landscape is not valued – just that other indicators of value have to be considered.

In undesignated landscapes the aim therefore is to identify the value of the landscape at a specific scale, identify the communities of interest to which it is important, and the reasons why the landscape is important to them. These can be based on existing evidence such as landscape character assessments, planning policies, landscape strategies and guidelines or from data derived from new survey and analysis.

The relationship between the value attached to the landscape and its susceptibility to change is complex. GLVIA (para. 5.4.6) notes that valued landscapes do not, automatically or by definition, have high susceptibility to all types of change. It is possible for a locally, nationally or even internationally important landscape to have relatively low susceptibility to change, by virtue of both the characteristics of the landscape and the nature of the proposal. The particular type of change or development proposed may not compromise the specific basis for the value attached to the landscape. Nevertheless, whilst value does not necessarily equate with suitability or lack of suitability of a particular landscape for a proposed development, it is an important contributing factor to understanding sensitivity.

2 METHODOLOGY FOR FIELD-BASED APPRAISAL

Classification

As explained above, the sensitivity or ability of the Mid Wales landscape to accommodate new 132kV overhead lines is determined by its susceptibility to change and by the value attached to it. Both susceptibility to change and value will be classified into one of three tiers as set out in Table 1 below:

Table 1 | Indicative Landscape Susceptibility to Change and Value Criteria

Level	Susceptibility to Change	Landscape Value
High	The landscape is very vulnerable to change. There is little scope to accommodate a new overhead line without effects upon its overall integrity.	The landscape is highly valued. The value is recognised by statutory landscape designation. The landscape is of more than local/county importance.
Medium	The landscape has some scope to accommodate a new overhead line without effects on its overall integrity.	The landscape may be locally valued.
Low	The landscape is robust and can accommodate a new overhead line without effects upon its overall integrity.	The landscape has little or no recognised value.

The evaluation of susceptibility and value will then be considered together to provide an overall profile of landscape sensitivity. Each landscape will be classified into one of five tiers, high, medium-high, medium, medium-low, or low, between which there is a gradual transition. These will be determined by professional judgement, based on the indicative descriptions in Table 2.

Table 2 | Categories of Landscape Sensitivity to 132kV Overhead Lines	
Sensitivity	**Definition of Sensitivity to Change from Overhead Lines**
High	A landscape whose overall character, its individual elements and/or features, or particular aesthetic or perceptual aspects are very vulnerable to change or loss and offer limited opportunities to accommodate a new overhead line. Typically includes: ▫ *Landscapes of particularly distinctive character and/or high scenic quality which may be statutorily designated;* ▫ *Landscapes containing elements/features that are nationally scarce, including mature vegetation such as ancient woodland or veteran trees; and* ▫ *Landscapes defined by very distinctive aesthetic or perceptual aspects.*
Medium - High	A landscape whose overall character, its individual elements and/or features, or particular aesthetic or perceptual aspects are reasonably robust, not particularly vulnerable to change or loss and offer some opportunities to accommodate new overhead lines. Typically includes: ▫ *Landscapes of positive character but with some evidence of alteration to/ degradation of elements/features resulting in areas of more mixed character;* ▫ *Areas of degraded character but which are valued by local communities;* ▫ *Landscapes containing elements/features that are locally commonplace;* ▫ *Landscapes containing elements/features that are rare or unusual locally but are in degraded or poor condition; and* ▫ *Landscapes with aesthetic or perceptual aspects that do not contribute particularly to local distinctiveness and quality.*
Medium – Low	A landscape which is of low quality whose overall character, individual elements and/ or features, or particular aesthetic or perceptual aspects are robust, tolerant to change and offer good opportunities to accommodate new overhead lines. Typically includes: ▫ *Landscapes of neutral character with few notable features;* ▫ *Landscapes which have been adversely altered or degraded;* ▫ *Landscapes containing elements/features that are nationally or regionally ubiquitous;* ▫ *Landscapes containing elements/features that detract from landscape character e.g. other overhead lines, power stations, major roads; and*
Low	▫ *Landscapes whose key aesthetic or perceptual aspects are negative.*

Because landscape characteristics and values do not readily lend themselves to scoring, and different criteria may carry different weights in different types of landscape and with different types and scales of development, each judgement will be accompanied by a narrative describing and justifying the sensitivity level ascribed.

Criteria

The assessment of landscape sensitivity in the field will be based on consideration of a range of criteria, each of which reflects aspects of the landscape which may be more, or less, affected by the development of overhead lines. These criteria are listed in Table 3, with a rationale which defines how they will be assessed in the field. Where appropriate, these criteria draw upon and are cross referenced to the routeing principles set out in the Holford Rules. Whilst the Holford Rules[3] relate specifically to high voltage lines supported on lattice steel towers, many of the principles can also be used as a guide to the routeing of lines supported on wood poles.

3 Guidelines on overhead line routeing were first formulated in 1959 by Lord Holford. NPS EN-5 states that the Holford Rules form the basis for the approach to routeing new overhead line (para 2.8.7)

During field work, notes will be recorded against each of the criteria. Recording will take place at a number of publicly accessible locations along each of the proposed line route alignments (BNC, BSC and CC) both within and outside the 100m corridor when visually included with it.

TABLE 3 | CRITERIA INFLUENCING SENSITIVITY

Susceptibility Criteria	Indicators of Higher/Lower Susceptibility	Holford Rules
Landform	Steep, dramatic or elevated landforms are generally more susceptible to overhead lines. This is because they are often prominent and distinctive in character. Valleys and low rolling hills are typically less sensitive because the lines may be back clothed by the surrounding higher ground.	4 + 5
Landcover	Simple uncluttered landscapes with sweeping lines and extensive areas of consistent groundcover are less likely to be susceptible to overhead lines on steel towers whereas landscapes with more complex, irregular or intimate landscape patterns (e.g. traditional field patterns) are less likely to be susceptible to overhead lines on wood poles. Trees and woodlands, although adding to complexity, can provide screening opportunities for wood poles and reduce the apparent height of steel towers.	5 + 6
Scale	Scale may relate to landform e.g. an extensive plateau or to landcover e.g. field boundary pattern. Large and medium scale landscapes are generally able to accommodate overhead lines more easily than smaller scale landscapes. Overhead lines on wood pole structures are better suited to medium scale landscapes as they are of a similar scale to mature trees which are often a feature of such landscapes. Large scale landscapes are more suited to the proportions of steel towers. Comparison of towers with human scale' landscape features such as individual trees and buildings may emphasise the height of steel towers.	N/A
Skylines	Landscapes that do not form a distinctive skyline or back cloth are typically less susceptible to overhead lines than those in which open, uninterrupted skylines are a distinctive feature. Overhead lines may be prominent on skylines and may interrupt the relationship between settlements and their landscape setting.	4 + 5
Prominent Landscape Features	Landscapes with strong visual features and focal points such as distinctive landforms or man-made landmarks such as hilltop settlements, monuments of church spires, are more susceptible to overhead lines than landscapes which have fewer visual foci. Overhead lines may detract from or conflict with these prominent landscape features.	4

Human Influence	The amount of overt human influence on the landscape (including nature of settlement and land use) may influence its susceptibility to overhead lines. Lines, are less likely to be conspicuous in landscapes that are characterised by modern development or land use and/or by the presence of road or rail infrastructure. Commercial forestry may also introduce an overt man-made influence to upland landscapes that would otherwise seem natural. The presence of overhead lines in settled and farmed landscapes may conflict with more traditional and farmed landscapes and erode their rural character.	N/A
Vertical Infrastructure	Landscapes that are already affected by vertical built structures such as communications masts, other pylons or chimneys, may be of reduced susceptibility to overhead lines. However where these vertical structures are seen in close proximity to the overhead lines, there may be visual conflicts referred to as 'wirescapes' where multiple lines converge.	6
Perceptual Aspects	Landscapes that provide opportunities to experience a sense of relative wildness, remoteness and/or relative tranquility, including a lack of overt man-made structures, freedom from man-made noise and perceived naturalness are typically more susceptible to overhead lines than landscapes that lack these qualities.	7
Value Criteria	**Indicators of Higher/Lower Value**	**Holford Rules**
Landscape Quality/ Condition	The intactness of the landscape is a reflection partly of the presence of characteristic natural and man-made elements/ features, which are generally in good condition and absence of significant incongruous or detractive elements/features.	N/A
Scenic Quality	General appeal of the landscape to the senses e.g. through combinations of some of the following: distinctive; dramatic or striking landform or patterns of landcover; strong aesthetic qualities which appeal to the senses, such as scale, form, colour and texture; and visual diversity which contributes to the appreciation of the landscape.	1 + 2
Cultural Heritage Conservation Interests	Presence of Registered Historic Landscapes or Registered Parks and Gardens. Presence of built structures, archaeological features and designed landscapes that provide distinctive landscape features, including parks and gardens and designed landscapes. Visible presence of historic landscapes or landscape elements/features that provide evidence of time depth, including settlement pattern and field boundary patterns. Presence of traditional land management practices which contribute to scenic quality e.g. coppicing.	1 + 2

Natural Heritage	The presence of internationally or nationally designated nature conservation assets including: Ramsar sites, SACs; SPAs; SSSIs; and National Nature Reserves. Presence of striking geological or geomorphological features that contribute to distinctive sense of place or scenic quality. Presence of wildlife, habitats and individual species that contribute to distinctive sense of place or scenic quality.	1 + 2
Recreational Value	The extent to which experience of the landscape makes an important contribution to recreational use and enjoyment of the area, through provision of parks, visitor facilities such as toilets and car parks and density of rights of way network or extent of open access land designated under CRoW[4]	N/A
Perceptual Aspects and Tranquility	The extent to which the landscape provides opportunities to experience a sense of relative wildness, remoteness and/ or relative tranquility. This may be influenced by a lack of overt man-made structures, visible and audible intrusion and perceived naturalness.	1 + 2
LANDMAP Overall Evaluation	The presence of an 'outstanding' overall evaluation for any of the five LANDMAP Aspects.	N/A

3 JUDGEMENT OF SENSITIVITY

Following completion of field work, an appraisal of the sensitivity of the landscape to the proposed overhead line will be made, based on consideration of all criteria. Professional judgement will be applied to help understand whether a new overhead line would adversely affect the landscape or whether it could be satisfactorily accommodated, and the degree to which adverse effects could be mitigated. When comparing the different criteria, greater weight will be given to those which correspond to the Holford Rules, since these are the guiding principles for routeing.

Sensitivity Mapping

Judgement of sensitivity are likely to vary along the corridor, which will then be divided into a number of mapped sections, based on variations in landscape sensitivity as observed in the field.

The sensitivity categories represent stages in a gradual transition (see Table 1). Similarly landscape sensitivity in most instances changes gradually and continuously across the landscape.

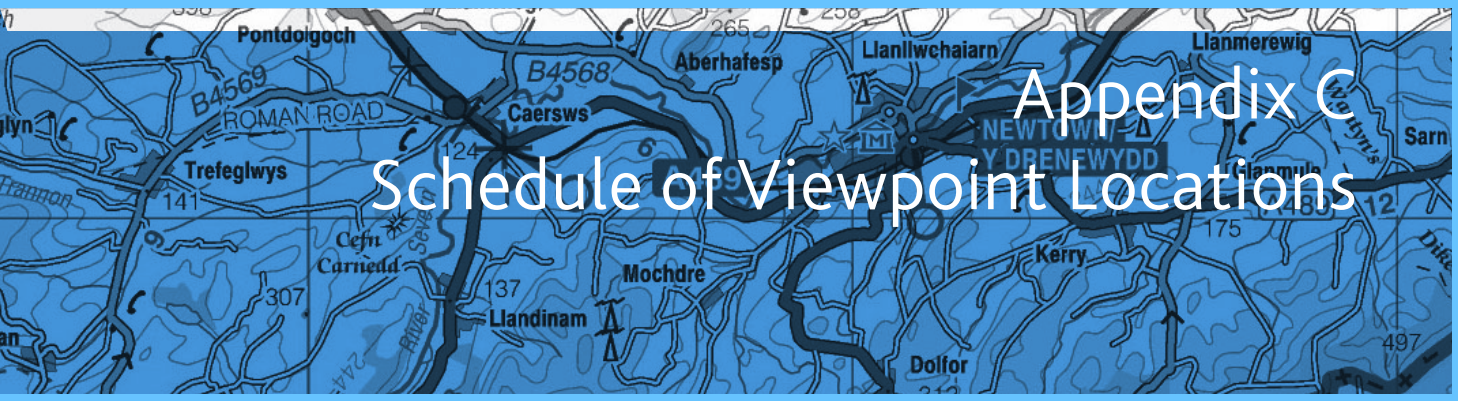
Sensitivity Matrix

The mapped sections will form the basis for the field-based sensitivity matrix. For each section, the matrix will include notes against each criterion. The matrix will summarise the key implications and opportunities for routeing, and record the sensitivity category assigned together with a short justification.

4 CONCLUSION

The findings of the field-based landscape sensitivity assessment will reflect local variations observed in the landscape along each of the Proposed Line Route Alignments and will be used as the basis for the assessment of landscape effects which will be included in the Environmental Statement (ES) for the Project.

4 Countryside and Rights of Way Act



Appendix C
Schedule of Viewpoint Locations

Schedule of Viewpoint Locations			
Ref.	**Description / Location**	**Reason for Selection**	**General direction of view**
1	Two Tumps on Kerry Ridgeway Regional Trail	Regional Trail, Scheduled Ancient Monument, elevated viewpoint	SW
2	Bridleway south of Glog	Public rights of way, close to start of proposed from Neuadd Goch Wind Farm	SW
3	Bridleway near Garn	Public right of way	NW
4	A483 looking north up River Ithon Valley	Main road, public right of way	NE
5	Footpath east of Bryn Llyndwr	Public right of way, view towards proposed substation	E
6	Minor road next to Glan-yr-Afon	Property close to route, view along Blue Lins Brook , Public right of way	NW
7	Intersection of footpaths near Banc Du	Public right of way	N
8	Bridleway west of Garn Fach (forest)	Public right of way, elevated viewpoint	SW
9	Glyndwr's Way near minor road close to Grach	National Trail, property, minor road, public rights of way (footpath and bridleway)	N
10	Glyndwr's Way near Flelin-gytrhos	National Trail, property close to proposed line, public rights of way crossed by proposed line	N
11	Glyndwr's Way near properties on minor road west of Pegwn Bach	National Trail, properties close to proposed line public rights of way crossed by proposed route	S
12	Intersection of footpaths at Flelin-gytrhos	Property close to proposed line public right of way, minor road crossed by proposed line	N
13	Intersection of footpaths on south side of Pant-poeth Hill	Public rights of way, elevated viewpoint	S
14	Intersection of minor road and footpath close Llwydiarth (property)	Properties, public right of way, elevated viewpoint	NE
15	Footpath on north side of Pant-poeth Hill	Public right of way, elevated viewpoint	W
16	Intersection of minor road close to The Cross (property)	Property, minor road	E
17	Glyndwr's Way on minor road near Cwm (property)	Property, National Trail crossed by proposed line public right of way,	W

18	Minor road bridge across River Severn/Afon Hafren close to T-junction with A489 and south of Dolwen (property)	Property, main and minor road	W
19	Caravan park on A470 in River Severn/Afron Hafren Valley	Property, caravan park, view of proposed line as it crosses main road and river	NW
20	Intersection of bridleway with A470 in River Severn/Afon Hafren Valley	Public right of way, elevated viewpoint on south side of valley with view of proposed line as it crosses river	NE
21	Intersection of footpath with Glyndwr's Way east of Bont-newydd (property)	View along proposed line running broadly parallel with National Trail	N
22	Caravan park on north bank of River Severn/Afon Hafren on northern edge of Llanidloes	Caravan park, public right of way, view down valley towards proposed line crossing river	E
23	Severn Way near B4569 on north side of Llanidloes	Regional Trail, elevated viewpoint looking down stream valley towards proposed line. Registered historic landscape	NE
25	Group of properties around intersection of minor roads east of Oakley Park	Properties, elevated viewpoint looking across Wigdwr Brook	W
26	Bridge crossing of Afon Cerist on B4569 west of Llyn Ebyr	Properties, view along Afon Cerist Valley	NE
27	Intersection of footpath with B5469 near Glangwden	Properties, public right of way, view along Afon Cerist Valley	E
28	Properties on bridleway west of Robins Bank	Properties close to proposed line public right of way	W
29	Intersection of footpaths with minor road near Pant north of Robins Bank	Property, public right of way, elevated view towards proposed line crossing Afon Cerist Valley	NW
30	Pwllglas (property) on minor road in Afon Cerist Valley	Property close to proposed line, public right of way	E
32	Intersection of footpaths near Wern in Afon Cerist Valley	Property close to proposed line public rights of way	NW
37	Intersection of footpaths and course of Roman Road near Argoed	Properties close to proposed route, public rights of way, Roman Road, elevated viewpoint on north side of Afon Cerist Valley	NW
38	B4569 in Trefeglwys	Edge of settlement	SE
39	Intersection of minor road, footpath and course of Roman Road with B4569 in on north side of Trefeglwys	Edge of settlement, public right of way, Roman Road	E
40	Intersection of footpaths with B4569 near Cefn Gwyn in Colwyn Brook Valley	Property, public right of way, view of proposed line crossing Colwyn Brook Valley	W

41	Minor road near Rhiwen (property?) on west side of Colwyn Brook Valley	Property, elevated viewpoint across minor stream valley towards proposed	E
42	Intersection of footpaths with minor road near Hafod	Property, public rights of way, elevated viewpoint	E
43	Intersection of footpath with minor road near Garthpwt	Property close to route, view of proposed line as it crosses footpath and public right of way	E
44	A470 at western edge of Clatter	Edge of settlement	NW
45	Intersection of footpaths north of Alltwnnog	Public rights of Way, elevated viewpoint from edge of Registered Historic Landscape with view of proposed overhead line crossing Caron Valley	W
46	Footpath near A470	Property close to proposed route, public right of way, view of proposed line as it crosses the Carno Valley	NW/SE depending on route selected
48	Minor lane near Ty-Gwyn	Properties, view of proposed line as it ascends minor stream valley	E
49	Intersection of footpaths near Blaen-y-cwym	Property close to proposed line public rights of way	E
50	Bridleway near Y Glonc	Public rights of way	W
51	Minor road near Mynydd yr Hendre	Elevated viewpoint, view of proposed line as it crosses minor road	E
53	Intersection of footpaths in upper Cwm Llwyd Valley	Public rights of way, elevated view towards two proposed lines as they cross the upper reaches of the Cwm Llwyd Valley	NE/SE
55	Intersection of footpaths on upper slopes of western side of Cwm Llwyd Valley	Public rights of way, elevated viewpoint	SE
56	Intersection of footpath with access track near Brynderlwyn	Property close to proposed line public right of way	NW
57	Intersection of footpath with minor road leading to Cwm-yr-annel on west side of Yr Allt	Public of right of way, elevated viewpoint looking across the Cwm Llwyd Valley	W
58	Intersection of footpath with A470 near Sarn and rail line	Property (listed building), public rights of way, main road, view of proposed line as it crosses Carno Valley	NW
59	Minor road west of Carno	View of proposed route as it crosses minor road	NE
60	Footpath near Tynyreithin	Property close to proposed route, public right of way, elevated view close to wind farm substation near start of proposed route	S

61	Properties on A470 north of Sarn	Properties, view along Carno Valley floor towards proposed line as it crosses railway line and main road	SE
62	Bridleway at Bryn y Castell	Public right of way	S
63	Minor road near Dol-y-garreg wen-isaf	Property, view down Afon Gam Stream Valley	NE
64	Glyndwr's Way above Cwmderwen	National Trail, elevated viewpoint looking towards start of line as it emerges from forest and crosses Nant yr Eira Valley	S
65	Intersection of footpath with minor road near Pencringoed	Property, public right of way, elevated viewpoint looking across the Cledan Valley	NW
66	Intersection of footpath and bridleway near Dol Hywel at Moel-Ddolwen	Property, SAM, public rights of way, elevated viewpoint looking towards proposed line as it runs along Afon Gam Valley	E
67	Track near minor road on east side of Afon Gam Valley	Property ?, elevated view of proposed route as it traverses western side of Afon Gam Valley	N
69	Intersection of footpaths with minor road near Goetre	Property?, public rights of way, elevated view of proposed route as it crosses the confluence of Afon Gam and Afon Banwy Valleys	N
70	Minor road near caravan park at Llangadfan	Properties and caravan park close to proposed route	SE
71	A458 west of Llanerfyl and close to properties at Goetre Fach	Close to properties , view along Afon Banwy towards proposed line	NW
73	Property on minor road close to A458	Property, main road	E
74	Intersection of footpaths, Glyndwr's Way and minor road near properties in Nant Wgan Valley	Properties, National Trail, public rights of way	W/E (depending on route selected)
75	Intersection of footpath with B4395	Public rights of way, view of the start of the proposed line as it emerges from forest	E
76	Intersection of footpaths, bridleway and Glyndwr's Way at B4395 near Penyfford	Property?, National Trail, public rights of way, start of line as it emerges from forest	W/E (depending on route selected)
NRW10	VP in Cwm Llwyd at SH 98470 01024 (approx).	NRW Feedback	NW
NRW12	Blaen y Cwm area along A470?	NRW Feedback	NE
NRW2	Nant yr Eira Valley	NRW Feedback	S
NRW3	National Trail near Nant Nodwydd Valley	NRW Feedback	E
NRW4	Public right of way in Afon Trannon Valley	NRW Feedback	W

NRW5	Footpaths around Llyn Ebyr around the lake.	NRW Feedback	W
NRW7	National Trail at Llangadfan	NRW Feedback	E
NRW8	Suggest Garreg Hir near Blaen-y-cwym	NRW Feedback	SW
NRW9	Footpaths near Carreg y Big	NRW Feedback	S
PCC2	Footpaths close to Graig Iar	PPC Feedback	N
PCC3	Glyndwr's Way, west of Moelfre	PPC Feedback	W
PCC5	Bottom of Cwm Llwydd at Cwm	PPC Feedback	S