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# Pentir to Trawsfynydd Reinforcement Project

Environmental Statement Volume 6: Wider Works

September 2025

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# Executive Summary

## Background

### Introduction

- i. This document (Volume 6 – Wider Works forms part of the Environmental Statement which accompanies applications by National Grid Electricity Transmission plc to construct and operate developments which comprise parts of the Pentir to Trawsfynydd Reinforcement Project (the ‘Project’). Volume 6 focuses on where works are expected to be required for the reinforcement works required to the existing 4ZC overhead line (OHL) known as the Wider Works.

### Wider Works Location

- ii. The western section of the 4ZC overhead line is approximately 35.7 kilometres (km) long and is in the administrative district of Gwynedd Council. It runs between Wern Cable Sealing End Compound (CSEC) (SH 543 402), approximately 2.5 km northwest of Porthmadog (SH 543401) and Pentir Substation (SH 559 677), approximately 4.5 km southwest of Bangor.
- iii. The eastern section of the 4ZC overhead line is approximately 9.9 km long and runs between Trawsfynydd Substation (SH 691 384), approximately 1.2 km south of Gellilydan and Garth CSEC (SH 596 388), approximately 2.5km east of Porthmadog. Following completion of the EVIP Project, the eastern section of overhead line will run between Trawsfynydd Substation and Cilfor CSEC and will be approximately 6.7 km long. The CSECs provide an interface arrangement allowing for the Glaslyn Cables to connect both east and west sections of the 4ZC overhead line.

### Wider Works

- iv. The Wider Works comprise two types of activity that will be undertaken on sections of the existing Pentir to Trawsfynydd 4ZC overhead line route. The route is formed by a double circuit, steel tower overhead line, designed to have a maximum operating voltage of 400,000 Volts (400 kV)
- v. The line comprises steel towers (pylons), supporting a conductor system (wires). The conductor system is arranged in two groups (circuits) of three conductor bundles (phases) each supported from crossarms attached to either side the tower bodies. In addition to the main conductor system, a protective earthwire runs between the tower peaks for the purpose of shielding the conductor bundles from lightning strikes. For telemetry and control purposes, a special earthwire with an embedded fibre optic communications cable (OPGW) can be installed or, alternatively, by tightly wrapping a fibre optic cable around the existing earthwire (“wrapped earthwire”).
- vi. The inland circuit (**Circuit B**) operates at 400 kV between Trawsfynydd (4ZC5) and Pentir (4ZC157).
- vii. Circuit A, between towers 4ZC70 and 4ZC140, has a 400 kV conductor system installed but is presently electrically disconnected from the wider power network. Jumper installation work will be undertaken at towers 4ZC70 and 4ZC140 to restore this part of the line to 400 kV operation.

- viii. The Eryri Visual Impact Provision (EVIP) Project in construction will remove a section of existing overhead line running between tower 4ZC27 (tower located approximately 500 metres northeast of Cilfor village) and Garth CSEC (4ZC37). To allow removal of the section of overhead line, a tunnel and cables installation will be constructed between a CSEC and tunnel headhouse (THH) to be established near tower 4ZC27 ("Cilfor CSEC") and a CSEC and THH to be established near Minffordd village ("Minffordd CSEC").
- ix. The Wider Works on the Pentir to Trawsfynydd route will be split into two types of work activity.

### **Reconductoring**

- x. Reconductoring of the coastal circuit (Circuit A) between towers 4ZC5 to 4ZC27 and towers 4ZC44 to 4ZC70, totalling 14.8 km is required to replace and upgrade the conductor system.
- xi. The majority of reconductoring work will be undertaken using a technique called continuous tension stringing.
- xii. Generally, the reconductoring works will be carried out in the following sequence:
- Access and enabling works, including vegetation clearance.
  - Scaffolding and crossing protection.
  - Overhead line tower steelwork and foundation surveys and strengthening.
  - Overhead line continuous tension stringing.
  - Removal of scaffolds and access and enabling works.

### **Fibre Optic Installation**

- xiii. The following works will be required to connect the proposed Bryncir Substation to National Grid's operational telecommunication's network:
- A section of underground fibre optic cable between the proposed Bryncir substation and the proposed relocated tower 4ZC67 (see **Volume 3: Bryncir Works**).
  - The replacement 8.1 km of existing earthwire in spans 4ZC44 to 4ZC70 with a new fibre optic OPGW earthwire.
  - The installation of a fibre wrapped cable to the 23.0 km length of existing earthwire between towers 4ZC70 and 4ZC140.
  - The fibre optic wrap will be installed in approximate 2 km sections.
  - Where wrapping of the existing earthwire is to take place, a special tug will be deployed along the earthwire carrying reels of fibre optic cable. The tug will ensure the fibre optic cable is wrapped tightly around the earthwire. Access will be required at all tower sites to transfer the tug over the tower peaks. Approximately every 8-10 spans, the tug will be reloaded with fresh reels of fibre optic cable. The jointing of reels of fibre optic cable will take place lower down in the base of the tower (Ref 2.2).
  - The fibre optic wrapping system requires no crossing protection measures although significant crossings (i.e. A and B roads, and rivers) will be monitored.

- Access and enabling works will be minimal. Where required, the equipment will be delivered by lorry loader or pick-up with tractor and all-terrain vehicle (ATV) support. At optical joint towers, for launching the tug unit, access will be required for larger vehicles (tractors and 3.5 tonne pick-ups). Access will be required to all other towers to transfer the tug unit over the tower peak.

### **Access and Enabling Works**

- xiv. Access routes will be required to each tower and haul roads will utilise routes from the nearest A or B road along unclassified roads to the site access point at the end of the public highways .
- xv. Bellmouth widening and vegetation clearance for visibility splays may be required at the access points from the highway onto private roads.
- xvi. Where the ground is unsuitable for temporary access panels, All-Terrain Vehicles (ATVs) may be used for the transport of personnel. For the delivery of heavier loads, such as materials and equipment, four-wheel drive tractors or “Hagglund” type tracked vehicles will be utilised.
- xvii. Where access routes cross watercourses, the existing crossings will be assessed for suitability for the proposed vehicles and upgraded where required. Upgrade options will depend on size and frequency of vehicles required to cross and could include new or replacement culverts; overbridging; steel or polymer road-plates; and/or temporary culverts.

### **Wider Works Site Layout**

- xviii. Indicatively, a main compound near Porthmadog and two satellite compounds, one near the Bryncir works site and one near Tower 4ZC027, would likely be used.
- xix. There would be tower working at every tower between towers 4ZC5 to 4ZC27 and 4ZC44 to 70 for reconductoring work and towers 4ZC70 to 4ZC140 for earthwire fibre wrapping work.
- xx. Laydown and storage areas would be at regular intervals along the length of the Wider Works site.
- xxi. Scaffold areas are required at all locations where the 4ZC overhead line passes over a highway, watercourse or other overhead line.
- xxii. Equipotential zones (EPZ) will be required at all puller or tensioner sites.

### **Programme**

- xxiii. The Wider Works are planned to be undertaken over a period of approximately 50 months from Q2 2026 – Q3 2029. The Wider Works will occur in phases,

### **Staffing and Employment**

- xxiv. The number of staff on the Wider Works site would vary according to the phase and activities being undertaken; some activities may be run concurrently. The peak construction staff would be between 20 and 50 workers.
- xxv. Generally, the works will be undertaken during daytime periods only, from Monday to Friday 7.00 am – 7.00 pm. Some weekend working may be required to meet operational and programme requirements.
- xxvi. The OHL works will be on a 10-days-on- two-days-off programme.

## Operation and Maintenance

- xxvii. No change in the current frequency of inspection or maintenance to the line is expected. Maintenance would be required through issues arising from inspection.

## Electric and Magnetic Fields

- xxviii. All equipment that generates, distributes or uses electricity produces electric and magnetic fields (EMFs). A separate EMF report has been produced which sets out the technical specifications of the Wider Works and how it complies with EMF exposure guidelines.

## Alternatives

- xxix. The works are required on the existing 4ZC OHL and there are no reasonable alternatives to the works identified.

## Key Findings of the Environmental Impact Assessment

- xxx. Potential effects could arise from the Wider Works on the following topics:

- Ecology and Nature Conservation.
- Historic Environment.
- Air Quality and Emissions.
- Climate Change.

- xxxi. All other topics were scoped out of the assessment:

### Ecology and Nature Conservation

- xxxii. The Study Area for Ecology and Nature Conservation varies for different receptors. A desk study was carried out to identify sites designated for nature conservation and records of protected or notable habitats and species (important ecology features) and INNS that are relevant to Wider Works site. Various field studies were also carried out.
- xxxiii. There are 18 international statutory sites for nature conservation (i.e. SAC, SPA and Ramsar sites) Study Area and one additional SAC designated for bats within 30 km of the Wider Works site. Fifty other statutory designated sites for nature conservation (SSSI, NNR, LNR) are in the Study Area. There are 286 non-statutory sites designated for nature conservation within the 2 km Study Area and 42 are in the Wider Works site.
- xxxiv. There are two North Wales Wildlife Trust (NWWT) sites in the 2 km Study Area -
- xxxv. There are 19 sites of Ancient Woodland in the Study Area, 6 sites of Restored Ancient Woodland, 10 sites of Ancient Semi-Natural Woodland and 3 sites of Ancient Woodland of Unknown Category, shown on Ancient and Veteran Trees. There are two ancient and four veteran trees present within the Wider Works site.
- xxxvi. There have been two ancient, and four veteran trees identified in the Wider Works site.
- xxxvii. There are various Habitats of Principal Importance (HoPI) and broad terrestrial habitats in the Study Area.

- xxxviii. The desk study returned records of protected and notable species within the 2 km Study Area for the preceding 10 years.
- xxxix. The proposed works have the potential to affect ecology and nature conservation through habitat loss (temporary and permanent), disturbance (light, noise, vibration and human activity), habitat degradation, species mortality and spread of INNS during construction.
- xl. Embedded mitigation includes but is not limited to:
- Root Protection Areas (RPA) of trees will be protected where practicable
  - Hedgerows will be retained and buffered by a minimum of 5 m where practicable
  - Vegetation clearance will avoid the core nesting bird period
  - Sensitive habitats, will be protected through the use of an appropriate temporary ground protection trackway or matting to limit damage to the existing habitat and to ensure that vehicles use the same route.
- xli. Additional mitigation measures will minimise any potential adverse effects on marsh fritillary butterflies, roosting bats, badgers, water vole, otter, great crested newt and fish, should they be present within the Wider Works site, including completing a pre-construction check amongst other measures.
- xlii. The assessment concludes that, with the incorporation of embedded and additional mitigation measures, significant effects are unlikely for Ecology and Nature Conservation

### **Historic Environment**

- xlili. A Study Area of 3 km from the Wider Works site has been defined to provide historical and archaeological context and to identify designated assets with the potential to be affected by the Wider Works and 500 m for non-designated assets.
- xliv. The Wider Works are proposed in a varied landscape ranging from mountainside heath, small river valleys, woodland, and farmland. The overall settlement pattern is that of substantial 19th-century farmhouses and outbuildings interspersed with hamlets and villages. Prehistoric settlements (hut groups and small forts) are dotted across the landscape, usually in the corners of fields.
- xlvi. There are three Scheduled Monuments, one Registered Historic Park and Garden (Grade II\*) and 35 non-designated historic assets in the Wider Works site. A further 637 non-designated archaeological assets and 16 Scheduled Monuments have been identified in the 500 m Study Area.
- xlvi. There is one World Heritage Site – the Slate Landscape of North West Wales (**UNESCO 1633**) in the 500 m Study Area.
- xlvi. There are two Registered Historic Park and Gardens and 90 Listed Buildings in 500 m of the Wider Works site. These include five Grade II\* and 85 Grade II listed buildings.
- xlvi. The Gwynedd Historic Landscape Characterisation (GHLC) forms part of a national project to characterise the historic landscape. The GHLC is formed of an assessment of historic and current mapping that separated blocks of landscape into types based upon land forms and land use. A number of GHLC types were identified in the Wider Works site.
- xlix. The Wider Works site is in a number of registered historic landscapes.



- I. Most historic assets (both designated assets and non-designated assets) were scoped out of further assessment in the baseline studies due to the lack of potential for impacts resulting from the Wider Works.
- li. The sources of potential Historic Environment effects during the construction phase of the Project include:
  - Temporary short-term impacts to historic assets as a result of change to their setting.
  - Permanent impacts to historic assets as a result of change to their setting.
  - Permanent physical impacts to below ground archaeological remains.
- lii. Embedded mitigation includes avoidance by design.
- liii. Potential impacts to below ground archaeological remains that cannot be avoided by design can be mitigated through a proportionate programme of archaeological investigation, recording and reporting, such as archaeological monitoring and/or excavation in advance of construction, which would form additional mitigation measures. This would not result in a reduction in the physical impacts to archaeological remains but would mitigate the impact by providing a greater understanding and appreciation of the evidential value of archaeological remains.
- liv. All identified impacts are limited to physical impacts during the construction phase. No significant effect has been identified on potential below ground archaeological remains along the Wider Works component of the Project.

### **Air Quality**

- iv. The Study Area for this assessment is the area over which potential direct and indirect effects of the Wider Works on local air quality are predicted to occur, noting that operation of the refurbished overhead line has been scoped out of the assessment. Various Study areas are used for differing receptors for Air Quality.
- lvi. A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces.
- lvii. As expected for all pollutants, background concentrations in the Study Area are low, due to the predominantly rural nature of the area.
- lviii. The sources of potential Air Quality and Emissions effects during the works include:
  - Dust emissions.
  - Site plant emissions.
- lix. Embedded mitigation measures include but are not limited to:
  - Ensure all vehicles switch off engines when stationary - no idling vehicles.
  - Sustainable power sources (solar panels etc.) to be used where practicable. Where available, generators are to be low emission with hybrid battery systems (or to current best practice).
  - Use enclosed chutes and conveyors (if used) and covered skips.
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.



- ix. Due to the length of the Project works site, there are amenity, air quality and ecology receptors close enough to the Project works site that are sensitive to changes in air quality emissions. However, provided all construction activities adhere to the mitigation measures listed in the CEMP, the potential magnitude of impacts will be negligible and not significant.
- lxi. The impact of construction equipment and machinery emissions is anticipated to be not significant. This is due to the good standard of baseline air quality and the limited duration of time in which such machinery will be operation, and the effectiveness of standard practice emissions control measures.
- lxii. Construction road traffic emissions and operational road traffic emissions impacts were screened out of the assessment.

### **Climate Change**

- lxiii. For the GHG assessment, the existing baseline refers to the current conditions at the Wider Works site. This includes the carbon stock and sources of GHG emissions within the boundary of existing on-site activities.
- lxiv. The current baseline for the CCRA and ICCI assessments is based on historic climate data obtained from the Met Office website recorded at the closest meteorological station to the Wider Works site (Cwmystadrlllyn).
- lxv. A separate GHG assessment for the Wider Works was not undertaken, as no materially different emissions sources or working methods were identified that would justify a standalone assessment.
- lxvi. However, a separate CCRA was undertaken for the Wider Works to reflect its specific location, design, and exposure to climate-related hazards.
- lxvii. It is estimated that the bulk of emissions (estimated around 95%) from the Wider Works will come from the A0 – A5 lifecycle stages (pre-works, product and works process stages).
- lxviii. Based on a qualitative assessment, the magnitude of GHG emissions is not material in the context of the UK and Welsh carbon budgets. The Wider Works are consistent with applicable UK and Welsh Government climate change policy and legislation.
- lxix. The Project will support the UK's transition to net zero by providing the necessary infrastructure to enable the increased transmission of low-carbon electricity. As renewable energy generation increasingly replaces higher-carbon energy sources, this aligns with the UK Government's goal of achieving an electricity system independent of fossil fuels by 2035.
- lxx. The Wider Works will be designed and operated in accordance with the risks and mitigation measures outlined in NGETs Climate Resilience Strategy.
- lxxi. No significant effects were identified for greenhouse gases or in the CCRA, therefore no additional mitigation is required.

# 1. Introduction

- 1.1.1 Volume 6 (this document) forms part of the Environmental Statement (ES) that accompanies applications by National Grid Electricity Transmission plc (NGET) to construct and operate the Pentir to Trawsfynydd Reinforcement Project (the 'Project').
- 1.1.2 This volume describes anticipated effects from activities that will comprise part of the Project which are not development and so do not require planning permission. The purpose of this volume is to allow decision-makers, determining applications for consent for development, to take account of these activities. The works described in this volume are not development but comprise refurbishment activities necessary for the safe and long term operation of existing overhead line assets. Previously, similar refurbishment activities have occurred on this route and, irrespective of the Project, would be necessary in the future.
- 1.1.3 A description of the works is provided in **Chapter 2: Wider Works**.

## 1.1 Structure of the Volume

- 1.1.4 This volume is structured as follows:
- **Chapter 1: Introduction.**
  - **Chapter 2: Wider Works.**
  - **Chapter 3: Assessment of Alternatives.**
  - **Chapter 4: Scope of Assessment.**
  - **Chapter 5: Likely Significant Effects.**
  - **Chapter 6: In-Combination and Cumulative Effects.**

## 1.2 Figures and Appendices

- 1.1.5 All figures noted in this volume are in an appendix attached to this volume in addition to a summary appendix (**Appendix A**) of the study area and baseline specific to this volume. All other supporting documents are compiled in **Volume 8: Appendices**.
- 1.1.6 The figure numbering system is as follows: Volume number, chapter number then 1, 2, 3 etc. For example, **Figure 6.1.1**.
- 1.1.7 The appendix numbering system is as follows: Volume number, chapter number, then A, B, C etc. For example, **Appendix 6.1.A**. All figures associated with a given appendix will follow the same system, followed by the figure number, for example, a figure to Appendix 6.1.A would be Figure 6.1.A.1, 2, 3 etc.

## 2. Wider Works

### 2.1 Introduction

- 2.1.1 This chapter provides a description of the locations where works are expected to be required for the reinforcement works required to the existing 4ZC overhead line (OHL) known as the Wider Works.

### 2.2 Wider Works Location

- 2.2.1 The western section of the 4ZC overhead line is approximately 35.7 kilometres (km) long and is in the administrative district of Gwynedd Council. It runs between Wern Cable Sealing End Compound (CSEC) (SH 543 402), approximately 2.5 km northwest of Porthmadog (SH 543401) (**see Volume 4: Glaslyn Cables Works**) and Pentir Substation (SH 559 677), approximately 4.5 km southwest of Bangor.
- 2.2.2 The eastern section of the 4ZC overhead line is approximately 9.9 km long and runs between Trawsfynydd Substation (SH 691 384), approximately 1.2 km south of Gellilydan and Garth CSEC (SH 596 388), approximately 2.5km east of Porthmadog. Following completion of the EVIP Project, the eastern section of overhead line will run between Trawsfynydd Substation and Cilfor CSEC and will be approximately 6.7 km long. The CSECs provide an interface arrangement allowing for the Glaslyn Cables to connect both east and west sections of the 4ZC overhead line (**see Volume 4: Glaslyn Cables Works**).
- 2.2.3 The locations of the proposed Wider works are illustrated on **Figure 6.2.1**, (the 'Wider Works site').
- 2.2.4 The Wider Works site passes through undulating land with a high point of 230 metres (m) Above Ordnance Datum (AOD) at Tower 4ZC113, west of Penffridd. The elevation of the Wider Works site gradually reduces to 10 m AOD at the Wern CSEC, where the works meet the Glaslyn Cables Works (**ES Volume 4**). As the Wider Works site continues east towards Trawsfynydd Substation, the elevation increases from 3 m AOD at Minffordd CSEC to 180 m AOD at Trawsfynydd Substation.
- 2.2.5 The Wider Works site intersects 71 Public Rights of Way (PRoW) including footpaths, bridleways and byways (open and restricted) along its length. The Wider Works site also intersects National Cycle Network (NCN) route 61, south of the A4085; NCN route 8 on four separate occasion, which broadly runs along the A487 between Bontnewydd and Penrhyndeudraeth; and NCN route 82 to the east of Minffordd.
- 2.2.6 The Wider Works site is characterised by predominantly rural land uses with scattered woodland. The Wider Works site runs through Grade 3a (good to moderate quality), Grade 3b (moderate quality), Grade 4 (poor quality) and Grade 5 (very poor quality) agricultural land as identified by Agricultural Land Classification (ALC) data (Ref 2.1).

- 2.2.7 The Wider Works site crosses numerous designated Main Rivers and their associated tributaries. Llyn Tecwyn-uchaf is also spanned by the Wider Works. The Wider Works also spans low, medium and high flood risk areas.
- 2.2.8 The Wider Works site passes through the Afon Gwyrfaï a Llyn Cwellyn SSSI and Special Area of Conservation (SAC), Glaslyn SSSI, Coedydd De Dyffryn Maentwrog SSSI, Ysbyty Bron y Garth SSSI, Ceunant Llennyrch National Nature Reserve (NNR) and Coedydd Derw a Safleoedd Ystlumod Meirion/Meirionnydd Oakwoods and Bat Sites SAC. Further designated sites are in the surrounding area. The Wider Works site also intersects multiple non-statutory Local Wildlife Sites (LWS) (candidate and confirmed) along its length. The Wider Works site and surrounding area also contain a variety of resources, including priority or notable habitats and records of protected or notable species.

## 2.3 Proposed Wider Works

- 2.3.1 The Wider Works comprise two types of activity that will be undertaken on sections of the existing Pentir to Trawsfynydd 4ZC overhead line route (**Figure 6.2.2**). The route is formed by a double circuit, steel tower overhead line, designed to have a maximum operating voltage of 400,000 Volts (400 kV)
- 2.3.2 The line comprises steel towers (pylons), supporting a conductor system (wires). The conductor system is arranged in two groups (circuits) of three conductor bundles (phases) each supported from crossarms attached to either side the tower bodies. For this type of construction, four individual wires make up each conductor bundle. Insulator strings and other fittings also form part of the overhead line construction. A 'jumper' is a short length of conductor used to create a temporary or permanent connection between two points. It is typically used to bypass a component or section of the line for maintenance works. In addition to the main conductor system, a protective earthwire runs between the tower peaks for the purpose of shielding the conductor bundles from lightning strikes. For telemetry and control purposes, a special earthwire with an embedded fibre optic communications cable (OPGW) can be installed or, alternatively, by tightly wrapping a fibre optic cable around the existing earthwire ("wrapped earthwire").
- 2.3.3 The inland circuit (**Circuit B**) operates at 400 kV between Trawsfynydd (4ZC5) and Pentir (4ZC157).
- 2.3.4 The coastal circuit (**Circuit A**) is complicated as, amongst other things, a section of the route between Pentir and Trawsfynydd currently provides access for a Scottish Power 132 kV circuit. As part of this Project, the 132 kV circuit will be restored to National Grid for 400 kV operation. For this Environmental Statement, the work requirements on Circuit A addressed in this ES are set out in **Table 2-1** below

Table 2-1 Route sections and scopes of work

Route section (Circuit A)	Design voltage	Operating voltage (Current)	Operating voltage (post works)	Scope of works
Trawsfynydd (4ZC5) to Cilfor CSEC (4ZC27)	400 kV	132 kV	400 kV	New circuit conductors and OPGW earthwire
Wern CSEC (4ZC44) to 4ZC70	400 kV	132 kV	400 kV	New circuit conductors and OPGW earthwire
4ZC70-4ZC140	400 kV	Electrically disconnected	400 kV	New fibre optic wrap to existing earthwire plus jumper work
4ZC140-Pentir (4ZC157)	400 kV	400 kV	400 kV	Currently in use, no proposals.

- 2.3.5 Circuit A, between towers 4ZC70 and 4ZC140, has a 400 kV conductor system installed but is presently electrically disconnected from the wider power network. Jumper installation work will be undertaken at towers 4ZC70 and 4ZC140 to restore this part of the line to 400 kV operation. Presently, there are no earthwire based fibre optic communication cables installed on this section of the overhead line.
- 2.3.6 The existing 4ZC overhead line comprises two separate sections. The **eastern section** running between Trawsfynydd Substation (4ZC5) and Garth Cable Sealing End Compound (CSEC) (4ZC37) and the **western section** running between Wern CSEC (4ZC44) and Pentir Substation (4ZC157). The existing Glaslyn Cables (see ES **Volume 3**) run between Garth CSEC and Wern CSEC.
- 2.3.7 The Eryri Visual Impact Provision (EVIP) Project in construction will remove a section of existing overhead line running between tower 4ZC27 (tower located approximately 500 metres northeast of Cilfor village) and Garth CSEC (4ZC37). To allow removal of the section of overhead line, a tunnel and cables installation will be constructed between a CSEC and tunnel headhouse (THH) to be established near tower 4ZC27 ("Cilfor CSEC") and a CSEC and THH to be established near Minffordd village ("Minffordd CSEC"). The replacement Glaslyn Cables (see ES **Volume 4**) will run between an extended Wern CSEC and the Minffordd CSEC where they will connect to the EVIP cables.
- 2.3.8 On completion of the EVIP works, the eastern section of the 4ZC overhead line will run from Trawsfynydd Substation (4ZC5) to Cilfor THH (4ZC27). The location of the towers are shown on **Figure 6.2.2**.
- 2.3.9 The Wider Works on the Pentir to Trawsfynydd route will be split into two types of work activity.

- 2.3.10 Work activity 1 will comprise reconductoring of Circuit A (currently operating at 132 kV but to return to service at 400 kV): the replacement of conductor insulators and fittings on the eastern section of line running between Trawsfynydd substation (4ZC5) and tower 4ZC27 and the western section of line running between Wern CSEC (4ZC44) and tower 4ZC70. In addition to the main reconductoring works, a new OPGW earthwire will be installed between Wern (4ZC44) and tower 4ZC70.
- 2.3.11 Work activity 2 will comprise the installation of a communications cable by wrapping a fibre optic cable around the existing earthwire, i.e. a “wrapped earthwire”, running between towers 4ZC70 and 4ZC140.

## Reconductoring

- 2.3.12 Reconductoring of the coastal circuit (Circuit A) between towers 4ZC5 to 4ZC27 and towers 4ZC44 to 4ZC70, totalling 14.8 km is required to replace and upgrade the conductor system as set out in **Volume 1: Project Introduction**.
- 2.3.13 During the works, the Contractor would operate under a site-specific Works Environmental Management Plans (WEMP). The WEMP would set out a variety of control measures for managing the potential environmental effects of the works including control and management of noise, dust, surface water runoff, waste and pollution control. All necessary licenses and permissions will be sought before work starts.
- 2.3.14 The majority of reconductoring work will be undertaken using a technique called continuous tension stringing. By this method, the existing conductors will be used as a hauling bond to pull through new conductors. The conductor arrangement will be kept under tension at all times using special puller/tensioner machines and will remain aloft.
- 2.3.15 Where necessary, at locations such as road, utility and property crossings, additional protection such as scaffolding shall be provided to afford a safe system of work.
- 2.3.16 Generally, the reconductoring works will be carried out in the following sequence:
- Access and enabling works, including vegetation clearance.
  - Scaffolding and crossing protection.
  - Overhead line tower steelwork and foundation surveys and strengthening.
  - Overhead line continuous tension stringing.
  - Removal of scaffolds and access and enabling works.
- 2.3.17 To cater for the overhead line topography, the work will be split into separate **pulling sections** of approximately 2-3 km each. At one end of each pulling section will sit a **tensioner machine** for feeding in drums of new conductor and at the other end will sit a **pulling machine** for the recovery and drumming of old conductor.
- 2.3.18 Intermediate towers will have pulley wheels or “blocks” fitted to permit the smooth passage of conductors.

## Overhead Line Tower Steelwork and Foundation Surveys and Strengthening

- 2.3.19 Condition surveys will be carried out prior to the commencement of works, which will involve climbing each tower. Foundation intrusive investigations will be done at



approximately 5% of towers along the route and will involve excavating to the bottom of the foundation concrete on one leg of the selected towers.

- 2.3.20 Prior to the installation of the new conductors: any damaged, corroded or overloaded bars will be replaced throughout the route. This will require access using tractors and vans. The towers are not expected to require significant modification, but in the event this is required, due to corrosion or damage of existing bars, heavier machinery may be required; this could include cranes and lorry loaders.

### Overhead Line Tension Stringing

- 2.3.21 The overhead line reconductoring will follow the sequence shown in **Table 2-1**. There will be as much overlap between the sections as possible.

Table 2-2 – Sequence of overhead line tension stringing

Sequence	Activity	Locations	Machinery requirements
1	Installation of earths to conductors.	All towers.	Tractor and van.
2	Remove spacers using trolley running along the conductors.	All tension towers (trolleys will travel past suspension towers on the conductors).	Tractor and 3.5 tonne pick-up to each tension tower.
3	Put the conductors in “running out blocks” (pulleys).	Suspension and intermediate tension towers.	Tractor and van.
4	Set up tension towers for pulling.	All tension towers.	18 or 26 tonne lorry loader, vans, tractors.
5	Setting up the puller/tensioner sites, including equipotential zones and drum storage areas	At the tension towers at each end of the pulling section.	18 or 26 tonne lorry loader, vans, tractors. Larger flatbeds for conductor drums if accesses allow. 20 tonne puller/tensioners.
6	Remove tension insulators and install running out blocks.	All tension towers.	18 or 26 tonne lorry loader, vans, tractors.
7	Using old conductor system, pull through new conductors.	Pulling section.	18 or 26 tonne lorry loader, vans, tractors.
8	Demobilise and move to next section.	All tension towers.	18 or 26 tonne lorry loader, vans, tractors. Larger flatbeds for scrap



Sequence	Activity	Locations	Machinery requirements
			conductor drums if accesses allow. 20 tonne puller – tensioners moved with flat-bed or tractor.
9	Clip in suspension towers.	Suspension towers.	Tractor and van.
10	Install new spacers (if required).	All tension towers (trolleys will travel past suspension towers on the conductors).	Tractor and 3.5 tonne pick-up to each tension tower.
11	Removal of earths to conductors.	All towers.	Tractor and van.

2.3.22 To provide a safe working area for operatives, the puller/tensioner machines are each located on an “equipotential zone”, these comprise load bearing, electrically conductive panels, bonded to equipment within the working area.

2.3.23 To resist the pulling forces imposed on the machines during stringing operations, the puller/tensioners are attached to four sledge mounted concrete blocks of around 8 tonnes each. The sledges are fitted with spikes to gain additional ground anchorage.

### Vegetation Clearance

2.3.24 The estimated vegetation loss required for each working area type is detailed below:

- Equipotential zone (EPZ) = 100%.
- Access roads (approx. 3 m width) = 100% including overhanging branches to approximately 4 m above road surface for suspension towers or 5 m for accesses to angle towers and EPZs. This would typically involve trackway or driving tracked vehicles directly on ground.

2.3.25 Tower working areas = 60%. In tower working areas (including scaffolds and laydown areas) low level vegetation will be cleared to ankle height is required to allow safe access by foot. There will be some tree losses but these will be kept to a minimum and all necessary pre-construction surveys, licenses and permissions will be sought before work removal

- Scaffold (low vegetation) = 60%, (high vegetation) = 80%. Vegetation would be removed where it interferes with the scaffold structure or backstay anchors, but generally this will involve strimming to below ankle height to reduce tripping hazard and allowed to grow back while the scaffold is in place. Anchors could be concrete blocks or “duck-bill” type driven anchors.

### Removal of Scaffolds and Access and Enabling Works

2.3.26 The Wider Works site will be cleared of all temporary access equipment including scaffolds, trackway and fences. The Wider Works site will be cleared with metal

detectors to ensure all components are removed. Re-seeding and re-planting will be carried out in line with the WEMP.

### Scaffolding and Crossing Protection

- 2.3.27 To provide a safe system of work, scaffolding structures will be erected where the overhead line passes over utilities, roads or watercourses. The structures will comprise “tube and clip” type scaffold towers, either singly or on each side of the crossing depending on the obstacle to be protected. For longer crossings, such as highways, the scaffold towers may support a net held by catenary wires. An example of such a structure is shown on **Error! Reference source not found.**



Plate 2-1– Example of scaffold structure

- 2.3.28 Ground reinforcement may be required prior to the installation of the scaffold: this may consist of trackway panels, stone pads or screwpile foundations.
- 2.3.29 Scaffold structures will be erected by hand to full height (under an electrical outage if required due to clearance). The catenary wires supporting the net will be pulled out by hand under a road-closure or utility outage and the nets pulled out and secured. These will be in place for approximately the duration of the section wiring works (2-3 weeks) plus a few weeks either side. SP Energy Networks (SPEN) may underground some of their lines prior to this work to avoid clashes.
- 2.3.30 Scaffolds will be dismantled in reverse procedure to the above.

### Fibre Optic Installation

- 2.3.31 The following works will be required to connect the proposed Bryncir Substation to National Grid’s operational telecommunication’s network:
- A section of underground fibre optic cable between the proposed Bryncir substation and the proposed relocated tower 4ZC67 (see **Volume 3: Bryncir Works**).

- The replacement 8.1 km of existing earthwire in spans 4ZC44 to 4ZC70 with a new fibre optic OPGW earthwire.
- The installation of a fibre wrapped cable to the 23.0 km length of existing earthwire between towers 4ZC70 and 4ZC140.
- The fibre optic wrap will be installed in approximate 2 km sections.
- Where wrapping of the existing earthwire is to take place, a special tug will be deployed along the earthwire carrying reels of fibre optic cable. The tug will ensure the fibre optic cable is wrapped tightly around the earthwire. Access will be required at all tower sites to transfer the tug over the tower peaks. Approximately every 8-10 spans, the tug will be reloaded with fresh reels of fibre optic cable. The jointing of reels of fibre optic cable will take place lower down in the base of the tower (Ref 2.2).
- The fibre optic wrapping system requires no crossing protection measures although significant crossings (i.e. A and B roads, and rivers) will be monitored.
- Access and enabling works will be minimal. Where required, the equipment will be delivered by lorry loader or pick-up with tractor and all-terrain vehicle (ATV) support. At optical joint towers, for launching the tug unit, access will be required for larger vehicles (tractors and 3.5 tonne pick-ups). Access will be required to all other towers to transfer the tug unit over the tower peak.

## Access and Enabling Works

- 2.3.32 Access routes will be required to each tower as set out in **Table 2-1**. Access routes would follow existing farmer's tracks, wherever possible and will be a mix of stone road, trackway or ATV access. Where there is an existing stone road, this may be scraped clean of soil and dressed with a layer of new stone to make it suitable for the works traffic.
- 2.3.33 Haul roads will utilise routes from the nearest A or B road along unclassified roads to the site access point at the end of the public highways. No work will be required on the haul roads except where the responsible authority has allowed overhanging vegetation to grow below the standard minimum clearance.
- 2.3.34 Bellmouth widening and vegetation clearance for visibility splays may be required at the access points from the highway onto private roads. The Contractor will determine where this is required and carry it out under temporary traffic management on the public highway. Planning consent will be obtained where required for any temporary works.
- 2.3.35 Access routes would follow existing farmer's tracks, wherever possible and will be a mix of stone road, trackway or ATV access. Where there is an existing stone road, this may be scraped clean of soil and dressed with a layer of new stone to make it suitable for the works traffic.
- 2.3.36 Where required, load spreading temporary access panels, such as "Trackway", will be used to protect sensitive habitats along access routes. The access panels will be installed using a Hiab type crane mounted on a flat-bed lorry.
- 2.3.37 Where the ground is unsuitable for temporary access panels (due to steepness, or being partially submerged), ATVs such as "Mule" or "Argocat" type vehicles may be used for the transport of personnel. For the delivery of heavier loads, such as materials

and equipment, four-wheel drive tractors or “Hagglund” type tracked vehicles will be utilised.

2.3.38 Where access routes cross watercourses, the existing crossings will be assessed for suitability for the proposed vehicles and upgraded where required. Upgrade options will depend on size and frequency of vehicles required to cross and could include new or replacement culverts; overbridging; steel or polymer road-plates; and/or temporary culverts.

### Programme

2.3.39 The Wider Works are planned to be undertaken over a period of approximately 50 months from Q2 2026 – Q3 2029 to coordinate with the wider Project. The Wider Works will occur in phases, which will include activities summarised below.

	2026				2027				2028				2029		
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
Fibre wrap installation															
Circuit A and earthwire															
Close out															

### Wider Works Site Layout

#### Wider Works Compounds

2.3.40 Indicatively, a main compound near Porthmadog and two satellite compounds, one near the Bryncir works site and one near Tower 4ZC027, would likely be used. These compound locations would be used with consent by the landowner and occupied as required.

### Tower Working Areas

2.3.41 There would be tower working areas (sites vary in size but are typically between 100m x 40 m) at every tower between towers 4ZC5 to 4ZC27 and 4ZC44 to 70 for reconductoring work and towers 4ZC70 to 4ZC140 for earthwire fibre wrapping work (Approx 40 m x 40 m). Where possible, tower working areas are beneath the OHL

#### Laydown Areas

2.3.42 Laydown and storage areas (approximate 15 m x 15 m) would be at regular intervals along the length of the Wider Works site. They would be adjacent to the access track, either at access entrances off the main road or next to the 4ZC tower within the working areas.

#### Scaffold Areas

2.3.43 Scaffold areas are required at all locations where the 4ZC overhead line passes over a highway, watercourse or other overhead line.

## EPZ Areas

- 2.3.44 Equipotential zones (EPZ) will be required at all puller or tensioner sites.

## Staffing and Employment

- 2.3.45 The number of staff on the Wider Works site would vary according to the phase and activities being undertaken; some activities may be run concurrently. It is anticipated that the following would be required for each phase of works:

- Vegetation clearance – six workers.
- Trackway contractors – four to eight workers.
- General civils works i.e. bellmouths, levelling minor works – six workers.
- Scaffolders – 20 workers.
- Overhead line tension stringing:
  - 30 line workers.
  - 10 engineers.
  - 10 support operatives.

## Hours of Working

- 2.3.46 Generally, the works will be undertaken during daytime periods only, from Monday to Friday 7.00 am – 7.00 pm. Some weekend working may be required to meet operational and programme requirements.
- 2.3.47 During the works, the Contractor would operate under a site-specific Works Environmental Management Plans (WEMP). The WEMP would set out a variety of control measures for managing the potential environmental effects of the works including control and management of noise, dust, surface water runoff, waste and pollution control. All necessary licenses and permissions will be sought before work commences.
- 2.3.48 The OHL works will be on a 10-days-on- two-days-off programme.

## 2.4 Operation and Maintenance

- 2.4.1 Visual inspections of the overhead line would be undertaken on an annual basis in line with current practices. Vegetation management would be undertaken, where required, to keep overgrowing vegetation away from the overhead line as is routine maintenance on all overhead lines. Given the works will not introduce any new operational or maintenance activities, operational impacts are scoped out of assessment for the Wider Works.

## 2.5 Electric and Magnetic Fields

- 2.5.1 All equipment that generates, distributes or uses electricity produces electric and magnetic fields (EMFs). A separate EMF report has been produced which sets out the technical specifications of the Wider Works and how it complies with EMF exposure

guidelines. This report is in **Volume 8, Appendix 7.1.A: Electric and Magnetic Field Assessment**.

## 3. Assessment of Alternatives

### 3.1 Introduction

- 3.1.1 This chapter outlines the alternatives to the Wider Works that have been considered by NGET.

### 3.2 Requirement for the Consideration of Alternatives

- 3.2.1 Part 5, 17 (3)(d) of the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (the '2017 TCP EIA Regulations') (Ref 3.1) states that an ES should include;

*“a description of the reasonable alternatives studied by the applicant or appellant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment.”*

### 3.3 Design Alternatives

- 3.3.1 The works are required on the existing 4ZC OHL and there are no reasonable alternatives to the works identified.



## 4. Scope of Assessment

- 4.1.1 Account has been taken of the proposed Wider Works as described in **Chapter 2 Wider Works**, their temporary duration and the baseline environment affected as summarised in **Appendix A. Table 4-1** Table 4-1 below considers potential receptors and likely significant effects and whether these have been scoped in or scoped out of further assessment Table 4-1.
- 4.1.2 Given the works will not introduce any new operational or maintenance activities, operational impacts are scoped out of assessment for the Wider Works.

Table 4-1 – Scope of Assessment for the Wider Works

Receptor	Scoped In/Out	Justification
Landscape and Visual Amenity		
Landscape character and visual amenity	<b>Scoped Out</b>	No discernible impacts are anticipated on landscape character and visual amenity as the works comprise temporary short-term refurbishment works and no new permanent structures are required.
Ecology and Nature Conservation		
Statutory designated sites 10 km (international) and 5 km (national and local) of the Wider Works site (extended to 30 km for international sites designated for bats).	<b>Scoped In:</b> <ul style="list-style-type: none"> <li>Coedydd Derw a Safleoedd Ystlumod Meirion/Meirionnydd Oakwoods and Bat Sites SAC (in Wider Works site).</li> <li>Coedydd De Dyffryn Maentwrog SSSI (in Wider Works site).</li> </ul>	<p>Works are proposed in Coedydd Derw a Safleoedd Ystlumod Meirion/Meirionnydd Oakwoods and Bat Sites SAC, Coedydd De Dyffryn Maentwrog SSSI, and Ceunant Llennyrch NNR. There is potential for temporary habitat loss through vegetation management. Works are also proposed on the boundary of Llystan Isaf SSSI.</p> <p>Habitat degradation could result from water quality impacts due to pollution and runoff, and from air quality impacts associated with dust.</p> <p>Potential injury, mortality or disturbance of associated bat species at Coedydd Derw a Safleoedd Ystlumod Meirion/Meirionnydd</p>

Receptor	Scoped In/Out	Justification
	<ul style="list-style-type: none"> <li>Ceunant Llennyrch National Nature Reserve (NNR) (in Wider Works site).</li> <li>Llystyn Isaf SSSI (immediately adjacent to the Wider Works site).</li> </ul>	<p>Oakwoods and Bat Sites SAC and Coedydd De Dyffryn Maentwrog SSSI (including lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) could also occur).</p> <p>The introduction of invasive non-native species (INNS) or further spread (where already present) during the works through the movement of machinery, vehicles and people could impact statutory designated sites through habitat degradation.</p>
	<p><b>Scoped In:</b></p> <ul style="list-style-type: none"> <li>Afon Gwyrfai a Llyn Cwellyn SAC and SSSI (in Wider Works site).</li> <li>Corsydd Eifionydd/Eifionydd Fens SAC (0.11 km south-west).</li> <li></li> </ul>	<p>The Wider Works site crosses Afon Gwyrfai a Llyn Cwellyn SAC and SSSI between Towers 4ZC120 – 4ZC121.</p> <p>No works are proposed in the SAC/SSSI boundaries and no habitat loss or fragmentation will occur.</p> <p>Habitat degradation could result from water quality impacts due to pollution and runoff, from air quality impacts associated with dust and the introduction or spread (where already present) of INNS.</p> <p>Potential injury, mortality or disturbance of species associated with Afon Gwyrfai a Llyn Cwellyn SAC (otter, Atlantic salmon (<i>Salmo salar</i>) and floating water plantain (<i>Luronium natans</i>)) could occur.</p> <p>One of the qualifying features of Corsydd Eifionydd/Eifionydd Fens SAC is the marsh fritillary butterfly (<i>Euphydryas aurinia</i>), whose main habitat type in Wales is Rhôs pasture - a distinctive, Welsh marshy grassland habitat. This habitat is usually dominated by tussocks of purple moor-grass and various rush (<i>Juncus</i>) species. Suitable habitats up to 2 km (marsh fritillary colonies vary in size with individuals rarely moving more than 1 km in their lifetime. However movements of up to 5 km is possible and 2 km has been adopted on a precautionary basis) of occupied sites can serve as functionally linked habitat (FLH) for this species; and such habitats are in the Wider Works site. The works have the potential to directly</p>

Receptor	Scoped In/Out	Justification
		and indirectly impact this qualifying feature through potential injury, mortality or disturbance and temporary loss of functional habitat.
	<b>Scoped In:</b> <ul style="list-style-type: none"> <li>Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (0.33 km north, at its closest point).</li> <li>Morfa Harlech SSSI (0.33 km north), Morfa Harlech a Morfa Dyffryn NNR (2.42 km west) and SAC (4.67 km south-east).</li> <li>Cors Gyfelog SSSI and NNR (0.11 km south-west).</li> <li>Pant Cae Haidd SSSI (0.10 km south-west).</li> </ul>	<p>These statutory sites are more than 0.3 km from the Wider Works site and no habitat loss or fragmentation or injury or mortality to associated species is anticipated in these sites. Otter are associated with some of these statutory designated sites and use water bodies and riparian habitats in the Wider Works site. No otter resting sites have been recorded in the Wider Works area, and injury or mortality of this qualifying species is not anticipated.</p> <p>No air quality impacts associated with dust are anticipated.</p> <p>Hydrological connections between these statutory designated sites and the Wider Works site exist, and there is the potential for habitat degradation from impacts to water quality due to potential pollution events and run-off. There is potential for disturbance to associated species (otter) from noise, lighting or visual effects outside these sites. Impacts to bird species for Morfa Harlech SSSI are not anticipated due to the limited amount of suitable habitat available to qualifying birds associated with this site across the Wider Works site. Should any qualifying birds be present in or adjacent to the Wider Works site, they would be in very low numbers.</p>
	<b>Scoped In:</b> <ul style="list-style-type: none"> <li>Glynllifon SAC and SSSI (0.89 km north-west).</li> <li>Coedydd Dyffryn Ffestiniog (Gogleddol) SSSI (0.91 km north-west).</li> <li>Dolorgan Barn SSSI (2.12 km south).</li> </ul>	<p>There will be no direct loss or fragmentation of habitats in Glynllifon SAC and SSSI, Coedydd Dyffryn Ffestiniog (Gogleddol) SSSI or Dolorgan Barn SSSI. Due to the distance of these sites from the Wider Works site and lack of hydrological connection, air quality impacts associated with dust and impacts to water quality from pollution events or run-off are not anticipated.</p> <p>The SAC and SSSIs comprise maternity roosts and hibernation sites for lesser horseshoe bats. Bats are not only dependent on their roosts and foraging habitat inside the SAC and SSSIs; feeding areas and commuting routes (flightlines) outside the designations</p>

Receptor	Scoped In/Out	Justification
		<p>may also be integral to sustaining the bat population. The Bat Conservation Trust (BCT) have defined Core Sustenance Zones (CSZ) for different bat species (Ref 4.1). A CSZ, as applied to bats, refers to the area surrounding a communal bat roost in which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. The BCT identifies a weighted average CSZ of 2 km for lesser horseshoe bats. It is a species that will forage during winter at which time its core foraging range is reduced to 1.2 km from the hibernation site. There will be no direct disturbance to maternity and hibernation roosts but it is feasible that the Wider Works could result in likely significant effects (LSEs) on foraging bats for example, through additional lighting. These SAC and SSSIs are scoped in.</p>
	<p><b>Scoped In:</b></p> <ul style="list-style-type: none"> <li>Migneint-Arenig-Dduallt SPA and SSSI (1.68 km east).</li> <li>Eryri SSSI (2.29 km east).</li> </ul>	<p>There will be no direct loss or fragmentation of habitats in Migneint-Arenig-Dduallt SPA and SSSI or Eryri SSSI. Due to the distance of these sites from the Wider Works site and lack of hydrological connection, air quality impacts associated with dust and impacts to water quality from pollution events or run-off are not anticipated.</p> <p>Potential impacts from noise and visual disturbance to breeding hen harrier (<i>Circus cyaneus</i>), chough (<i>Pyrrhocorax pyrrhocorax</i>), merlin (<i>Falco columbarius</i>) or peregrine (<i>Falco peregrinus</i>), for which these sites are designated, could occur should these species nest in proximity (species dependant) to the Wider Works.</p>
	<p><b>Scoped In:</b></p> <ul style="list-style-type: none"> <li>Afon Ddu SSSI (1.71 km north)</li> <li>Llyn Padarn SSSI (1.39 km south-east)</li> </ul>	<p>There will be no direct loss or fragmentation of habitats in Afon Ddu SSSI or Llyn Padarn SSSI. Due to the distance of these sites from the Wider Works site and because they are upstream, air quality impacts associated with dust and impacts to water quality from pollution events or run-off are not anticipated.</p> <p>Afon Ddu SSSI is designated for its freshwater pearl mussel, and although this species would not be directly impacted by the Wider Works, it is dependent on the presence of salmonids within the</p>

Receptor	Scoped In/Out	Justification
		watercourse to fulfil its life cycle. The outflow of Llyn Padarn SSSI is one of the most important spawning sites for salmon and sea trout ( <i>Salmo trutta trutta</i> ) in north Gwynedd. Any impacts downstream to salmonids from the Wider Works could potentially impact this species and these statutory sites are scoped in.
	<b>Scoped out:</b> <ul style="list-style-type: none"> <li>Coed Camlyn NNR (1.02 km north).</li> <li>Coed y Rhygen SSSI and NNR (1.10 km south).</li> <li>Migneint-Arenig-Ddualt SAC (1.68 km east).</li> <li>Coed Tremadog SSSI and NNR (1.57 km east)</li> <li>Eryri/Snowdonia SAC (2.29 km east).</li> <li>Parc y Borth LNR (2.66 km south-east).</li> <li>Rhinog SAC and SSSI (3.33 km south).</li> <li>Pen y Banc LNR (3.08 km south-east).</li> <li>Coed Cymerau NNR (3.45 km north).</li> <li>Rhosgyll Fawr SSSI (3.22 km south-west).</li> </ul>	<p>These statutory designated sites are over 1 km from the Wider Works site. There will be no direct loss or fragmentation of habitats in these sites or air quality impacts associated with dust from the Wider Works. The sites possess no hydrological connection to the Wider Works site and are not designated for mobile species (bats, birds or marsh fritillary butterfly).</p> <p>The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and they are scoped out from further assessment.</p>

Receptor	Scoped In/Out	Justification
	<ul style="list-style-type: none"> <li>• Caeau Tan y Bwlch SSSI (3.53 km west).</li> <li>• Afon Eden - Cors Goch Trawsfynydd SAC and SSSI (3.63 km south).</li> <li>• Cwm Cynfal SSSI (5.09 km north-east).</li> <li>• Y Twyni o Abermenai i Aberffraw/ Abermenai to Aberffraw Dunes SAC (6.10 km west).</li> <li>• Glannau Mon: Cors heli/ Anglesey Coast: Saltmarsh SAC (6.67 km north-west).</li> <li>• Llyn Idwal Ramsar (9.98 km south-east).</li> </ul>	
	<p><b>Scoped out:</b></p> <ul style="list-style-type: none"> <li>• Northern Cardigan Bay/Gogledd Bae Ceredigion SPA (2.53 km south).</li> <li>• Traeth Lafan/Lavan Sands, Conway Bay SPA (9.90 km north-east).</li> </ul>	<p>Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats in these statutory sites or air quality impacts associated with dust from the Wider Works. Northern Cardigan Bay/Gogledd Bae Ceredigion SPA is designated for its overwintering population of red-throated diver (<i>Gavia stellata</i>), a species that primarily inhabits coastal areas during the winter months. Marine activity is being its primary source of disturbance. Traeth Lafan/Lavan Sands SPA is designated for its populations of wading birds. The Wider Works are inland and over 2 km from these SPAs. There will be no impacts on the species for which these sites are designated, including any noise or visual disturbance on functionally linked land.</p>

Receptor	Scoped In/Out	Justification
		The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and they are scoped out from further assessment.
	<b>Scoped out:</b> <ul style="list-style-type: none"> <li>Tiroedd a Glannau Rhwng Cricieth ac Afon Glaslyn SSSI (0.86 km south-east).</li> <li>Maes Meillion a Gefail-y-cwm SSSI (2.135km south).</li> <li>Glanllynau a Glannau Pen-ychain i Gricieth SSSI (2.86 km south-west).</li> <li>Talhenbont SSSI (2.74 km south-west).</li> <li>Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC (4.15 km north-west).</li> </ul>	<p>These statutory sites are designated for their habitats. Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats within these statutory sites or air quality impacts associated with dust from the Wider Works.</p> <p>The sites are hydrologically linked to the Wider Works site but the closest is more than 1.5 km downstream. Ad any potential effects (should they occur) would be sufficiently diluted to ensure that there would be no adverse impact on these designated sites.</p> <p>The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and are scoped out from further assessment.</p>
	<b>Scoped out:</b> <ul style="list-style-type: none"> <li>Glaslyn SSSI (2.43 km north-west).</li> <li>Y Foryd SSSI (4.83 km north-west) and Local Nature Reserve (LNR) (4.94 km north-west).</li> </ul>	<p>Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats in these statutory sites or air quality impacts associated with dust from the Wider Works. Y Foryd SSSI and LNR is hydrologically linked to the Wider Works site but is more than 4 km downstream, and any potential effects (should they occur) would be sufficiently diluted to ensure that there would be no adverse impact.</p> <p>Glaslyn SSSI is designated for its overwintering wildfowl and waders and breeding birds of lowland damp grassland. The Wider Works are over 2 km from this SSSI and there will be no impacts on the species for which these sites are designated, including any</p>



Receptor	Scoped In/Out	Justification
		<p>noise or visual disturbance. Glaslyn SSSI is also designated for lesser horseshoe bats, however, as it is beyond the 2 km CSZ for this species there is no potential for the Wider Works to result in significant effects to this species due to disturbance.</p> <p>Y Foryd SSSI and LNR is designated for its wintering wildfowl and waders; given the distance from the Wider Works site and the minimal nature of the works in this section (fibre wrap) no impacts are anticipated on the species for which this site is designated from the Wider Works, including noise or visual disturbance.</p> <p>The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and they are scoped out from further assessment.</p>
	<p><b>Scoped out:</b></p> <ul style="list-style-type: none"> <li>Ysbyty Bron y Garth SSSI (2.22 km north-west).</li> <li>Mwyngloddiau Llanfrothen SSSI (2.21 km north-west).</li> <li>Coedydd Maentwrog NNR (2.60 km south).</li> <li>Aberdunant SSSI (3.84 km north-east).</li> <li>Glyn Cywarch SSSI (3.91 km south-west).</li> <li>Mwyngloddiau Fforest Gwydir/ Gwydyr Forest Mine SAC (19.87 km north).</li> </ul>	<p>Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats within these sites or air quality impacts associated with dust. These sites are not hydrologically linked to the Wider Works site and there will be no impacts to water quality from pollution events or run-off. These sites are designated for lesser horseshoe bats, however, as they are beyond the 2 km CSZ for this species there is no potential for the Wider Works to result in significant effects due to disturbance.</p> <p>The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and they are scoped out from further assessment.</p>

Receptor	Scoped In/Out	Justification
	<b>Scoped out:</b> <ul style="list-style-type: none"> <li>Cors y Wlad SSSI (2.51 km north-west).</li> </ul>	<p>Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats within this site or air quality impacts associated with dust. The site is not hydrologically linked to the Wider Works site and there will be no impacts to water quality from pollution events or run-off. This site is designated for marsh fritillary butterfly however, as it is beyond the 2 km buffer accepted as FLH for this species there is no potential for the Wider Works to result in significant effects due to disturbance or loss of FLH.</p> <p>The Wider Works will have no direct or indirect impacts on this statutory designated site or its ecological features and they are scoped out from further assessment.</p>
	<b>Scoped out:</b> <ul style="list-style-type: none"> <li>Cors Llanllyfni SSSI (0.90 km east).</li> <li>Cors Graianog SSSI (1.66 km east).</li> <li>Llwyn y Coed SSSI (1.54 km south-east).</li> <li>Ffriddoedd Garndolbenmaen SSSI (2.01 km north-east).</li> <li>Ceunant Cynfal SSSI (2.17 km north) and NNR (2.30 km north-east).</li> <li>Coed Dinorwig SSSI (3.70 km south-east) and LNR (3.62 km south-east).</li> </ul>	<p>Due to the distance from the Wider Works site, there will be no direct loss or fragmentation of habitats in these sites or air quality impacts associated with dust. These statutory sites are hydrologically linked to the Wider Works site but are upstream and not designated for migratory species that could potentially be affected downstream by the Wider Works. They are not designated for terrestrial mobile species (bats, birds or marsh fritillary butterfly).</p> <p>The Wider Works will have no direct or indirect impacts on these statutory designated sites or their ecological features and they are scoped out from further assessment.</p>

Receptor	Scoped In/Out	Justification
Non-statutory designated sites (Wildlife Sites (WS), candidate Wildlife Sites (cWS), North Wales Wildlife Sites (NWWT)) in 2 km of the Wider Works site and Ancient Woodland	<p><b>Scoped in:</b></p> <ul style="list-style-type: none"> <li>For direct effects: <ul style="list-style-type: none"> <li>42 WS and cWS are in the Wider Works site.</li> <li>Two ancient woodland sites are in the Wider Works site.</li> </ul> </li> <li>For indirect effects: <ul style="list-style-type: none"> <li>All WS, cWS and ancient woodland in 50 m, and all with hydrological links.</li> </ul> </li> </ul> <p><b>Scoped out:</b></p> <p>All remaining WS, cWS and ancient woodland further than 50 m from the Wider Works site that are not hydrologically linked.</p> <p>All NWWT are these sites are more than 1 km from the Wider Works site.</p>	<p>Non-statutory designated sites and ancient woodland that are in the Wider Works site could be directly impacted through temporary vegetation management. The introduction or further spread (where already present) of INNS through the movement of machinery, vehicles and people could also impact non-statutory designated sites and ancient woodland through habitat degradation.</p> <p>Non-statutory designated sites and ancient woodland which are hydrologically linked to the Wider Works site could potentially be indirectly impacted through changes to water quality. Sites within 50 m could potentially be indirectly impacted by dust.</p>
Habitats of Principal Importance (HoPI)	<p><b>Scoped in:</b></p> <ul style="list-style-type: none"> <li>Coastal floodplain and grazing marsh.</li> <li>Lowland dry acid grassland.</li> <li>Lowland fen.</li> </ul>	<p>HoPI that are in the Wider Works site could be directly impacted during the works through temporary vegetation management. Those which are hydrologically linked to the Wider Works site could potentially be indirectly affected through changes to water quality. The introduction or further spread (where already present) of INNS during the works through the movement of machinery, vehicles and people could also indirectly impact HoPI through habitat degradation.</p>

Receptor	Scoped In/Out	Justification
	<ul style="list-style-type: none"> <li>• Lowland heathland.</li> <li>• Lowland meadow.</li> <li>• Lowland mixed deciduous woodland.</li> <li>• Purple moor-grass and rush pasture.</li> <li>• Rivers.</li> <li>• Upland oakwood.</li> <li>• Wet woodland.</li> <li>• Wood pasture and parkland.</li> <li>• Standing water.</li> <li>• Hedgerows and Cloddiau.</li> </ul>	
Habitats (non-HoPI)	<p><b>Scoped in:</b></p> <ul style="list-style-type: none"> <li>• Broadleaved semi-natural woodland.</li> <li>• Broadleaved plantation woodland.</li> <li>• Mixed semi natural woodland.</li> <li>• Mixed plantation woodland.</li> <li>• Scattered trees (including ancient and veteran).</li> </ul>	<p>Habitats (non-HoPI) that are in the Wider Works site could be directly impacted during the works through temporary vegetation management.</p> <p>Those which are hydrologically linked to the Wider Works site could also potentially be indirectly affected through changes to water quality. The introduction or further spread (where already present) of INNS during the works through the movement of machinery, vehicles and people could also indirectly impact these habitats through habitat degradation.</p> <p>Based on Chartered Institute of Ecology and Environmental Management (CIEEM) guidelines (Ref 4.2) and using professional judgement, features of Site importance, i.e. less than Local (Low) importance, have been scoped out of further assessment.</p>

Receptor	Scoped In/Out	Justification
	<ul style="list-style-type: none"> <li>Neutral semi-improved grassland.</li> </ul> <p><b>Scoped out:</b></p> <ul style="list-style-type: none"> <li>Scrub.</li> <li>Improved grassland.</li> <li>Poor semi-improved grassland.</li> <li>Buildings, fences, walls and dry ditches.</li> </ul>	
Protected and notable species.	<p><b>Scoped In:</b></p> <ul style="list-style-type: none"> <li>Terrestrial invertebrates.</li> <li>Fish.</li> <li>Aquatic. macroinvertebrates.</li> <li>Aquatic macrophytes.</li> <li>Breeding and non-breeding birds.</li> <li>Bats.</li> <li>Badger.</li> <li>Otter.</li> <li>Water vole.</li> <li>Great crested newt.</li> </ul>	The Wider Works have the potential to impact protected and notable species (where present or potentially present) through temporary vegetation management, replacement of culverts and, fragmentation and disturbance. The works also have the potential to result in incidental mortality of species and could also disturb protected and notable species through increased noise and vibration, lighting and through visual disturbance.

Receptor	Scoped In/Out	Justification
	<ul style="list-style-type: none"> <li>• Other mammals (hedgehog, brown hare and polecat).</li> <li>• Reptiles.</li> <li>• Common amphibians.</li> <li>• Notable flora, fungi and lichen.</li> </ul> <p><b>Scoped out:</b></p> <ul style="list-style-type: none"> <li>• Red squirrel.</li> <li>• Hazel dormouse.</li> </ul>	
<b>Historic Environment</b>		
World Heritage Site	<b>Scoped Out</b>	No physical or additional setting impacts on the World Heritage Site.
Scheduled Monuments	<b>Scoped In</b>	The works have the potential for temporary short term impacts upon the character and setting of Scheduled Monuments.
Listed Buildings	<b>Scoped Out</b>	No physical or additional setting impacts on Listed Buildings.
Registered Parks and Gardens	<b>Scoped Out</b>	No physical or additional setting impacts on Registered Parks and Gardens.
Conservation Areas	<b>Scoped Out</b>	No physical or additional setting impacts on Conservation Areas.
Historic Landscapes	<b>Scoped Out</b>	No physical or additional setting impacts on Historic Landscapes.
Historic non-designated assets	<b>Scoped In</b>	The works have the potential to impact, truncate or remove buried archaeological remains.

Receptor	Scoped In/Out	Justification
Unknown archaeological/ buried archaeological remains	<b>Scoped In</b>	The works have the potential to impact, truncate or remove buried archaeological remains.
<b>Geology, Hydrogeology, Land Use and Agriculture (Soils)</b>		
<b>Geology</b>		
Geology	<b>Scoped Out</b>	The Wider Works are above ground and no impacts are anticipated to underlying geology.
Sites designated for geodiversity interest	<b>Scoped Out</b>	No sites designated for geodiversity interest have been identified across the Wider Works, therefore impacts have been scoped out.
Ground stability	<b>Scoped Out</b>	No breaking ground or construction of additional structures are anticipated for the Wider Works therefore impacts have been scoped out.
<b>Hydrogeology</b>		
Groundwater – Secondary A and undifferentiated aquifers and industrial, commercial and public services groundwater abstraction	<b>Scoped Out</b>	The works will be above ground where no pathway can be created to impact groundwater across the Wider Works.
Groundwater – In vicinity of the residential PWS	<b>Scoped Out</b>	
<b>Mineral Safeguard Areas</b>		
MSA	<b>Scoped Out</b>	No impacts are anticipated to MSA's or preferred areas for minerals across the Wider Works as the works are above ground.
Preferred areas for minerals	<b>Scoped Out</b>	



Receptor	Scoped In/Out	Justification
<b>Agricultural Soils</b>		
Agricultural land	<b>Scoped Out</b>	No impacts are anticipated to agricultural land across the Wider Works
<b>Receptors to Land Contamination</b>		
Project workers	<b>Scoped Out</b>	No impacts are anticipated with regards to receptors of contaminated land across the Wider Works as works will be undertaken above ground.
Maintenance workers	<b>Scoped Out</b>	
Off-site human health receptors (isolated farms and residential over 250 m away)	<b>Scoped Out</b>	
Off-site human health receptors (agricultural land users)	<b>Scoped Out</b>	
Surface water -Unnamed watercourses in the Wider Works site and 250 m Study Area	<b>Scoped Out</b>	
Development infrastructure (foundations and underground cables)	<b>Scoped Out</b>	
Ecological sites/flora and fauna (cWS and ancient woodland)	<b>Scoped Out</b>	

Receptor	Scoped In/Out	Justification
Water Quality, Resources and Flood Risk		
Flood risk	Scoped Out	<b>Fluvial and Surface Water Flood Risk</b> There are no proposed activities that are anticipated to affect flood risk. There are no proposed new permanent impermeable areas, raised structures in flood zones, stockpiles of excavated material in flood zones or new watercourse crossings and culverts anticipated. It is recommended that contractors sign up to Met Office Weather reports and NRW flood warnings, and in the event of heavy rain being forecast they should leave the site.
Aquatic environment	Scoped Out	<p><b>WFD Groundwater Bodies</b> The WFD waterbody is of Poor Status, and due to the works being non-intrusive and the limited extent of proposed works compared to the area of the groundwater body and the low permeability of bedrock, and anticipated effectiveness of environmental embedded measures, there are no anticipated risks to the WFD waterbody's current status or reduction in its ability to meet good in future.</p> <p><b>WFD Surface Water bodies</b> Although the proposed works cross and are in proximity to multiple WFD Surface Water bodies, there are no intrusive works proposed, and all overhead line crossings of the water bodies are already present. There are no proposed changes to any watercourse crossings and culverts, and temporary working and storage areas will be appropriately located away from WFD Surface Water bodies. The implementation of the mitigation measures included within the Environmental Management Plan (EMP) and the production of a Pollution Prevention Plan (PPP) and the scheme design with no new watercourses crossings, or changes to existing watercourse crossings being proposed will ensure that there are no impacts to water quality or quantity that could risk the current or future status of WFD surface water bodies within the Study Area.</p>

Receptor	Scoped In/Out	Justification
		<p><b>Conservation Sites</b> The proposed works cross and are in proximity to multiple designated conservation sites, however, there are no intrusive works proposed, and all overhead line crossings of the conservation sites are already present. There are no proposed changes to any watercourse crossings and culverts, and temporary working and storage areas will be appropriately located. The implementation of the mitigation measures included within the EMP and PPP will ensure that there are no impacts to water quality or quantity that could affect conservation sites within the Study Area.</p>
Water resources	Scoped Out	<p><b>Private Water Supplies</b> There are no anticipated effects to the quality or availability of water supplies. Embedded environmental measures (detailed within the EMP) and the scheme design which avoids works in close proximity to private water supplies, so as to prevent any significant impacts on local groundwater quality, quantity or resource availability.</p> <p>In line with good practice, PPPs will be developed to detail how ground and surface waters will be protected from construction and operation related pollution. These will include information on the use and storage of any fuels, oils and other chemicals, and pollution incidence response planning.</p> <p><b>Licensed Abstractions</b> There will be no effects on channel conveyance and water availability, and there will be no release of sediment into the watercourse that could affect the quality of an abstraction. A PPP will detail pollution prevention measures for all works to mitigate against water quality impacts that may impact the abstractions.</p> <p><b>NRW Consented Discharges</b> There are no planned project activities in close proximity to any licensed discharges in the Study Area that will cause physical disruption to existing discharge infrastructure.</p>

Receptor	Scoped In/Out	Justification
		The location of statutory undertaker assets (including water supply and sewer pipes, water and waste treatment works etc.) will be confirmed through inspection of detailed plans from the undertakers. All assets potentially affected by the Proposed Development will be identified.
Traffic and Transport		
Severance	Scoped Out	Due to the expected n traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on severance.
Driver Delay	Scoped Out	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on driver delay due to congestion at key junctions.
Pedestrian Delay	Scoped Out	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on pedestrian delay.
Non-motorised user (NMU) amenity	Scoped Out	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on pedestrian and cyclist amenities that would affect safety and comfort of non-motorised users.
Fear and intimidation	Scoped Out	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on fear and intimidation for vulnerable road users.
Road safety and accidents	Scoped Out	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts on road safety.

Receptor	Scoped In/Out	Justification
Total traffic increase	<b>Scoped Out</b>	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts as a result of an total traffic increase.
Heavy Goods Vehicles (HGV) increase	<b>Scoped Out</b>	Due to the expected traffic volumes and the spread of the works geographically and over time, it is not anticipated that there will be significant impacts as a result of HGV increase.
Hazardous loads	<b>Scoped Out</b>	There are no nearby road features which suggest that the transfer of hazardous materials poses a risk beyond that which would be expected on the general highway network, indicating no significant impacts.
<b>Air Quality and Emissions</b>		
Designated/candidate wildlife sites and priority habitats	<b>Scoped In</b>	The Wider Works site passes over numerous designated and candidate Wildlife Sites and priority habitats and there is potential for the works to generate dust emissions which may impact the sites.
Residential properties	<b>Scoped In</b>	There are a large number of residential properties or other amenity and human health sensitive receptors in the indicative Wider Works site that have the potential to experience effects related to dust and emissions.
Human health (from emissions from works traffic)	<b>Scoped Out</b>	Given the extent of the works, significant air quality effects are unlikely, particularly as the Wider Works site runs through rural areas for the most part. The Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) guidance screens out road traffic emissions impacts on human health receptors where average development HGV flows are less than 100 two-way movements per day on any given road link. For nature conservation impacts, we would refer to Design Manual for Roads and Bridges (DMRB) guidance (LA 105 Standard for Air Quality (Ref 4.3), which screens out road traffic emissions where development HGV flows

Receptor	Scoped In/Out	Justification
		(and cumulative flows associated with committed and reasonably foreseeable development in the area) are less than 200 two-way movements per day on any given road link. <b>Chapter 2 Wider Works</b> states that the Wider Works will generate four two-way HGV movements per day, a value well below the screening criteria.
Noise and Vibration		
Residential Receptors	Scoped Out	Potential temporary noise and vibration effects may result from the works. The works would be minor and temporary, and would not generate high levels of noise. Additionally, workforce numbers and deliveries are low, so levels of traffic would be sufficiently low such that they would not have a material effect on noise.
Socio-Economics		
Employment generation during works phase and operational and maintenance phase (direct, indirect and induced impacts)	Scoped Out	The Wider Works are likely to generate a limited number of jobs, relative to the existing workforce within the Principal Economic Impact Area. Employment impacts are likely to be beneficial but not significant.
Skills and training	Scoped Out	Due to the works being refurbishment the workforce is limited, effects on skill levels and training are unlikely to be significant.
Gross Value Added	Scoped Out	GVA generated is proportionate to the size of the workforce; as for employment impacts any effects in this context are anticipated to be not significant relative to the size of the Principal Economic Impact Area.
Local accommodation facilities	Scoped Out	Due to the limited size of the workforce, there is unlikely to be pressure on the local temporary accommodation sector. Furthermore, as identified in Section 12.5, there is considerable capacity in a 30-minute and 60-minute drive time to accommodate

Receptor	Scoped In/Out	Justification
		workers.
Public Rights of Way (PRoW) and recreational routes	<b>Scoped Out</b>	There are 71 PRoWs, National Cycle Route (NCR) 8 and NCR 61 that cross the Wider Works site, with a substantial number of PRoWs in the wider area. Although some PRoWs may need to be crossed during works at which time a short duration closure will be in place for safety purposes and thus no significant effects are anticipated.
Other private and community assets (residential properties, business premises, community facilities, open space, agricultural land holdings, development land)	<b>Scoped Out</b>	There are a number of private and community assets within the Wider Works site and Study Area, however given the contained and temporary nature of the Wider Works, no significant effects are anticipated.
<b>Climate Change</b>		
Global atmosphere (Greenhouse Gas (GHG) Assessment)	<b>Scoped In</b>	A GHG Assessment has been scoped into the climate assessment to evaluate the potential GHG emissions associated with the Wider Works.
The Wider Works (Climate Change Risk Assessment (CCRA))	<b>Scoped In</b>	A CCRA has been scoped in to assess the potential climate risks associated with the Wider Works.
Various identified by each discipline in their assessment (In-combination Climate Change Impacts (ICCI) Assessment).	<b>Scoped Out</b>	It is not anticipated there will be any ICCIs on the receptors in the surrounding environment and an ICCI Assessment has been scoped out of the climate assessment.



- 4.1.3 For the Wider Works component of the Project assessment of Landscape and Visual Amenity, Geology, Hydrogeology, Land Uses and Agriculture, Traffic and Transport, Noise and Vibration, Socio-Economics, and Materials and Waste effects have been scoped out of the ES as no discernible impacts are anticipated .This is because the works will be temporary and in operation, the reductored overhead line sections including the section installed with the fibre optic cable would be very similar to the existing overhead line with no discernible impact.

# 5. Likely Significant Effects

- 5.1.1 This chapter presents an assessment of the likely significant effects that could arise from the Wider Works as described in **Chapter 2: Wider Works**.

## 5.1 Ecology and Nature Conservation

- 5.1.1 Effects on ecology can arise from direct and indirect impacts upon designated sites, habitats or species, and be temporary or permanent. Indirect effects can occur through pollution of air and water and via changes in lighting, noise or hydrology. This section is supported by information in:

- **Figure 6.5.1:** Statutory Designated Sites for Nature Conservation in the Wider Area (up to 30 km).
- **Figure 6.5.2:** Statutory Designated Sites for Nature Conservation within 5 km.
- **Figure 6.5.3:** Non-Statutory Sites Designated for Nature Conservation within 2 km.
- **Figure 6.5.4:** Ancient Woodland and Habitats of Principal Importance within 50 m.
- **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance.**
- **Volume 8, Appendix 1.4.A: Topic Assessment Methodology.**
- **Volume 8, Appendix 6.5.A: Habitat Survey Report.**
- **Volume 8, Appendix 6.5.B: Aquatic Survey Report.**
- **Volume 8, Appendix 6.5.C: Bat Survey Report.**
- **Volume 8, Appendix 6.5.D: Badger Survey Report (Confidential).**
- **Volume 8, Appendix 6.5.E: Riparian Mammals Survey Report (Confidential).**
- **Volume 8, Appendix 6.5.F: Great Crested Newt Survey Report.**
- **Volume 8, Appendix 6.5.G: Statutory Designated Site Citations.**
- **Volume 8, Appendix 6.5.H: High Level Arboriculture Impact Assessment.**
- **Section 5.4: Air Quality and Emissions.**
- **Section 5.5: Climate Change.**

### Legislation and Planning Policy

- 5.1.2 This section summarises the legislation and planning policy framework that is relevant to the Ecology and Nature Conservation assessment. Details are in **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance**.

#### Legislation

- 5.1.3 The following legislation is relevant to Ecology and Nature Conservation:
- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations) (Ref 5.1).

- Ramsar Convention (Ref 5.2).
- Convention on Biological Diversity 1992 (Ref 5.3).
- Wildlife and Countryside Act 1981 (WCA) (as amended) (Ref 5.4).
- The Environment Act 2021 (Ref 5.5).
- The Environment (Wales) Act 2016 (Ref 5.6).
- The Countryside and Rights of Way Act 2000 (Ref 5.7).
- The Protection of Badgers Act 1992 (Ref 5.8).
- The Hedgerows Regulations 1997 (Ref 5.9).
- The Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (Ref 5.10).
- Animal Welfare Act 2006 (Ref 5.11).
- Salmon and Freshwater Fisheries Act 1975 (Ref 5.12).
- Eels (England and Wales) Regulations 2009 (Ref 5.13).
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 5.14).
- Convention on the Conservation of Migratory Species (CMS) of Wild Animals 1979 (or Bonn Convention) (Ref 5.15).
- The Council of Europe's Convention on the Conservation of European Wildlife and Natural Habitats 1979 (or Bern Convention) (Ref 5.16).
- Natural Environment and Rural Communities Act 2006 (Ref 5.17).

### **National Policy**

5.1.4 The following National policy is relevant to Ecology and Nature Conservation:

- Planning Policy Wales (PPW) – Edition 12 (2024) (Ref 5.18).
- The Nature Recovery Action Plan for Wales 2020 – 2021 (Ref 5.19).
- Future Wales: The National Plan 2040 (Ref 5.20).

### **Local Policy**

5.1.5 The following local policy is relevant to Ecology and Nature Conservation:

- Anglesey and Gwynedd Joint Local Development Plan 2011 – 2026 (Ref 5.21).
- Anglesey and Gwynedd Joint Local Development Plan Review Report (Ref 5.22).
- Eryri Local Development Plan 2016 – 2031 (Ref 5.23).
- Eryri Local Development Plan Review Report 2023 (Ref 5.24).

### **Guidance**

5.1.6 The following guidance is relevant to Ecology and Nature Conservation:

- Environmental Improvement Plan 2023 (Ref 5.25).

- Cyfoeth Naturiol Cymru/Natural Resources Wales (NRW) Protected Species Licensing (Ref 5.26).
- Birds of Conservation Concern (BoCC) (Ref 5.27).
- Birds of Conservation Concern Wales (BoCCW) (Ref 5.28).
- The International Union for Conservation of Nature Red List of Threatened Species 2025 (Ref 5.29).
- UK Biodiversity Framework (JNCC) on Behalf of the Four Countries' Biodiversity Group (2024) (Ref 5.30).
- Nature Gwynedd Biodiversity Action Plan (Ref 5.31).
- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Ref 5.32).
- Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (Ref 5.33).
- Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (Ref 5.34).
- Institute of Lighting Professionals. Guidance Note 1 for the Reduction of Obtrusive Light (Ref 5.35).

5.1.7 Ecological Impact Assessment Methodologies are detailed in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

5.1.8 Guidance and methodologies used for ecological surveys are detailed in their respective reports as included in **Volume 8, Appendices 6.5.A – 6.5.I**.

## Assumptions, Limitations and Uncertainties

5.1.9 The assessment presented in this section reflects the information obtained and evaluated at the time of reporting (July 2025), and references published data, records and web-based information. Due to an evolving design, as well as the land access available within survey seasons, a full suite of surveys has not been undertaken for the Wider Works. The assessment is based on the information gathered, with assumptions and extrapolations where necessary. Pre-commencement surveys will inform the works, mitigation and any licences required.

5.1.10 As noted in **Chapter 2: Wider Works**, the earliest works could start is in 2026. Works are anticipated to require at least three years, with operation anticipated to commence in 2029. Should the works programme be extended this will not change the results of the Ecological Impact Assessment (EclA) with respect to flora, as the impact is not affected by the duration of activity but rather the change or loss of any habitats. The impact on fauna is likely to be similar if the works period is extended, with respect to any temporary habitat disturbance. The assessment also represents a worst case in terms of impacts to species. For example, although it is acknowledged that a longer works period could result in prolonged disturbance, this is unlikely to occur for most of the Wider Works site due to the sequential nature of the works.

5.1.11 Specific assumptions and limitations relevant to each survey, including how any limitations have been overcome, are included in the relevant technical reports presented in **Volume 8, Appendices 6.5.A – 6.5.F**. There are no survey-specific constraints that

represent a significant limitation or data gap and the baseline that has been established is suitably robust.

5.1.12 The assessment is also based on the following assumptions in the design with regards to ecology:

- No work will be required on the haul roads when identified except where the responsible authority have allowed overhanging vegetation to grow below the standard minimum clearance (standard minimum clearance 5.03 m height and 3 m width).
- The working area for Tower 4ZC007 is on the edge of ancient woodland. No works will take place or vegetation removal or strimming in this ancient woodland and access is not required through this woodland.
- In order to access Towers 4ZC017 – 19, access will be required through Fen-valley mire habitat. Habitat trimming or use of bog mats will be required due to dense vegetation.
- Existing access routes will be used and there will be requirement to upgrade existing tracks in some locations but will largely remain unaltered. In some areas stone will be laid to enable access for vehicles.
- In working areas (including at the base of each tower, scaffolds and laydown areas) low level vegetation will be strimmed to allow safe access by foot. Trees will, in most cases, be worked around. Where they are identified for full or partial removal in the works area the contractor will undertake all necessary surveys and apply for appropriate licenses to remove the trees.
- Tree removal is minimal and will only take place at Towers 4ZC023, 4ZC045, 4ZC046, 4ZC059 and 4ZC061 with some trimming of trees at Towers 4ZC006, 4ZC016, 4ZC026 and 4ZC060.
- Hedgerows will not be removed as existing access routes will be used (using existing gaps or gates). Hedgerow surveys were not carried out to inform this assessment.
- Works on the edge of Coedydd Derw a Safleoedd Ystlumod Meirion/Meirionnydd Oakwoods and Bat Sites SAC and Coedydd De Dyffryn Maentwrog SSSI will be minimal and temporary and only take place between Towers 4ZC014 and 4ZC016, comprising works to Tower 4ZC015 and provision of an access track, which will require trimming of overhanging branches only and strimming of vegetation around the towers. There will be no tree or vegetation removal. The Wider Works site crosses over the SAC and SSSI between Towers 4ZC012 and 4ZC013, however this is over a ravine and no works will take place in the SAC and SSSI at this location. An existing access from Towers 4ZC015 and 4ZC016 that passes through ancient woodland may be temporarily utilised by ATV, trimming of overhead branches may be required to allow access but no other vegetation or trees will be removed.
- The Wider Works site crosses over Afon Gwyrfaï a Llyn Cwellyn SAC and SSSI between Towers 4ZC120 and 4ZC121, however there will be no works in the SAC or within 150 m of the SAC or SSSI.
- Llystyn Isaf SSSI is east of Tower 4ZC071. No works will take place in this SSSI, therefore no permanent or temporary habitat loss.

- Works within WS and cWS will be avoided, where possible. Any works within WS and cWS will be minimal and temporary in nature.

5.1.13 Access was not possible between the following locations and could not be surveyed:

- Land between Tower 4ZC050 and 4ZC052.
- A section of land north of Tower 4ZC057.
- A section of land west of Tower 4ZC071.
- Land between Tower 4ZC075 and 4ZC078.
- Land between Tower 4ZC089 and 4ZC090.
- A section of land between Tower 4ZC103 and 4ZC104.
- A section of land between Tower 4ZC129 and 4ZC131.
- A section of land west between Tower 4ZC132 and 4ZC133.

5.1.14 Desk based assessments were conducted for these areas to identify designated sites for nature conservation and HoPI. Coastal and floodplain grazing marsh is potentially present at Tower 4ZC027, Derwin cWS (marshy grassland, wet heath and acid grassland), purple moor grass and rush pasture is potentially present at Tower 4ZC075, Derwyn-fawr (marshy grassland and acid grassland) and purple moor grass and rush pasture is potentially present at Tower 4ZC078, Below Bron Haul cWS (marshy grassland), purple moor rush grass and rush pasture and lowland acid grassland is potentially present between Towers 4ZC089-90. The assessment section takes into account these cWS and habitats and appropriate mitigation where necessary is included. In addition the proposed works between Towers 4ZC070-140 are minimal and comprise new fibre optic wrap and jumper work.

5.1.15 Preconstruction surveys will be carried out to confirm habitat types and inform any mitigation required in these areas.

## Future Baseline

5.1.16 This section considers changes to the baseline conditions, previously described, that might occur in the absence of the Wider Works and during the period over which the Wider Works would have been in place.

5.1.17 Some changes in habitat extent, composition and structure would occur naturally over time because of ecological succession e.g. the gradual establishment of tree and scrub in marshy grassland areas, woodland areas and along hedgerows. INNS may also spread across the Wider Works site. These resultant gradual changes in habitat composition are unlikely to alter materially the ecological baseline and the habitats and species present are very unlikely to undergo significant change prior to the start of works or during the works period.

5.1.18 Other potential changes may arise due to farming practices and as a result of climate change which may influence the resilience of certain habitats and species adjacent to the Wider Works site. Habitats such as broadleaved trees and scrub would be more mature but are likely to support a broadly similar species assemblage and farmland will also be managed accordingly, maintaining broadly similar species assemblages. Notwithstanding, it is acknowledged that in the absence of the Project, reconductoring works and fibre wrap replacement of fibre optic cable would take place as part of

maintenance of the existing overhead line and would result in the same or similar effects as identified in this assessment.

## Consultation

- 5.1.19 Consultation in relation to Ecology and Nature Consultation has been carried out with stakeholders. **Table 5-1** provides an overview of consultation and the actions taken to address any responses within the assessment.

Table 5-1 – Consultation and stakeholder engagement

Consultee	Date and nature of consultation	Summary of response	How and where addressed
NRW	12/09/2024	Knowledge sharing	N/A
Gwynedd County Council	29/05/2024	Project introduction	N/A
Eryri National Park	07/10/2024	Project introduction	N/A

## Methodology

- 5.1.20 Details of the technical methods used to determine the baseline conditions of the Wider Works site are provided in **Section 5.5** and technical appendices ES **Volume 8, Appendices 6.5.A – 6.5.G**. Details regarding assessment methods including sensitivity of the receptors, magnitude of effects and the significance criteria that have been used for the ecology assessment are in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

## Potential Effects

- 5.1.21 The proposed works associated with the Wider Works have the potential to affect important ecology features (positively or negatively):
- Habitat loss (temporary and permanent) – direct impacts associated with changes in land use resulting from the Wider Works.
  - Disturbance – indirect impacts resulting from a change in normal conditions (i.e. increased light, noise, vibration, human activity) that result in individuals or populations of species changing behaviour or range.
  - Habitat degradation – direct or indirect impacts resulting in the reduction in the condition of a habitat and its suitability for some or all of the species it supports, e.g. changes in air quality affecting woodland from dust or changes in water quality due to contamination.
  - Species mortality – direct impacts on species populations associated with mortalities due to works activities, e.g. site clearance.
  - Spread of INNS – working methods resulting in spread of INNS.



## Embedded Mitigation

- 5.1.22 It is anticipated that where practicable, mitigation measures will be incorporated into the Wider Works design and how it will be constructed. Potential impacts have been predicted on this basis and opportunities to mitigate them identified with the aim of preventing or reducing impacts as far as practicable. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation and mitigation by design approach has been considered when evaluating the significance of the potential effects on important ecological features (IEFs).
- 5.1.23 The primary avoidance and mitigation measures that will be embedded into the Wider Works to minimise impacts on IEFs are presented in the following sections.

### Project Design and Habitat Avoidance

- 5.1.24 The root protection areas (RPA) of trees will be protected where practicable. However, some tree removal will be unavoidable, limited to locations at Towers 4ZC023, 4ZC045, 4ZC059 and 4ZC061.
- 5.1.25 Details regarding unavoidable works in tree RPAs is contained in the High-Level Arboricultural Impact Assessment report (**Volume 8, Appendix 6.5.H: High Level Arboricultural Impact Assessment**). Precautionary measures discussed in that report include protective fencing and temporary ground protection measures (where necessary) and ensuring all soil storage remains outside tree RPAs.
- 5.1.26 Hedgerows and cloddiau will be retained and buffered by a minimum of 5 m where practicable.
- 5.1.27 Watercourses will be protected by 10 m buffers as far as practicable. However, works to replace culverts may be required in Derwyn-fawr candidate Wildlife Site (cWS), Ystumcegid-isaf cWS and Gwernddwryd cWS. Works will be designed to avoid affecting the banks of the watercourses with working areas, laydown areas, positioning of vehicles and machinery outside of the cWS.

### Works Environmental Management Plan

- 5.1.28 A WEMP that includes measures to manage the environmental effects of the Wider Works and demonstrate compliance with environmental legislation will be implemented. The WEMP will detail the measures required to mitigate works-related effects on IEFs, including those associated with dust deposition, air pollution, pollution incidents, water quality, light, noise and vibration. The WEMP will detail how habitats will be maintained and managed to enhance biodiversity and ecology.

### Vegetation Clearance and Works – Protected Species

- 5.1.29 Vegetation clearance will avoid the core nesting bird period (i.e. March to August inclusive). Where vegetation clearance cannot avoid the core nesting bird period, a check for the presence of any active nests would be carried out by a suitably experienced ornithologist, prior to vegetation removal. Pre-works checks of pylons and any other suitable nesting structures (none currently known) up to 500 m of works will also take place to determine the status of peregrine. If active nests are found, then appropriate buffer zones (species dependent) where no works take place would be marked out and the area monitored until the young birds have fledged. In areas suitable for reptiles, clearance would be carried out at an appropriate time of year, concordant with requirements for nesting birds.

- 5.1.30 Precautionary working methods will be adhered to in areas of habitat suitable for reptiles, common amphibians and common mammals (including tall grassland, marshy grassland, hedgerows and riparian habitat) to avoid the incidental killing or injury of any such species that may be present. All habitats suitable for reptiles, common amphibians and common mammals will be subject to two-stage habitat manipulation. Firstly, vegetation will be cut to approximately 150 millimetres (mm) (with the arisings removed), overseen by a suitably experienced appointed ecologist and the area left for a minimum of one day to allow any such species to naturally disperse. Secondly, vegetation will be cleared down to ground level, which will be overseen by the ecologist. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of killing or injuring reptiles, common amphibians and common mammals. Works can commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during the works where practicable. Any habitat features which could be concealing sheltering reptiles and amphibians (e.g. log piles, rubble mound bunds, any other debris) would not be dismantled during their inactive season (i.e. November to February inclusive) if they cannot be retained.

### **Habitats**

- 5.1.31 There will be no vegetation clearance or removal apart from strimming to allow access along existing tracks and roads and to existing tower locations. This will be minimal and localised and vegetation will be allowed to re-establish, vegetation will be reinstated where necessary. Branches of trees will be trimmed back to allow access at Towers 4ZC006, 4ZC016, 4ZC026 and 4ZC060 only. Tree removal is required at Towers 4ZC023, 4ZC045, 4ZC046, 4ZC059 and 4ZC061 only.
- 5.1.32 Sensitive habitats, including habitats in WS and cWS will be protected through the use of an appropriate temporary ground protection trackway or matting to limit damage to the existing habitat and to ensure that vehicles use the same route through the WS or cWS and stay in defined working areas.

### **Lighting**

- 5.1.33 It is anticipated that the works will be restricted to daylight hours wherever practicable, to remove the need for artificial lighting, with focussed task-specific lighting provided where this is not practicable. However task specific and fixed 'general' lighting will likely be required in months with reduced daylight hours (early mornings and up to 7.00 pm for general workforce) to meet safety requirements. General low-level lighting for access will be required at the temporary works compounds.
- 5.1.34 Where lighting is required, it will conform to best practice guidelines with respect to minimising light spill into adjacent habitats and preventing disturbance to bats and other species, including Institute of Lighting Professionals Guidance Notes (in particular GN08/23 Bats and Artificial Lighting at Night (Ref 5.34)). This guidance, was produced in collaboration with the Bat Conservation Trust, and GN-1: Reduction of Obtrusive Light (Ref 5.35), will be followed in so far as it is reasonably practicable.

### **Wildlife Legislation Compliance**

- 5.1.35 To comply with relevant wildlife legislation, relevant pre-works surveys, such as an updated Phase 1 habitat survey, check for badger (*Meles meles*) setts, otter (*Lutra lutra*) resting sites or holts and bat roost assessments of any affected trees or structures near to the Wider Works, will be undertaken to support the baseline findings. Checks for nesting birds (including nesting peregrine on pylons) will also be undertaken. The purpose of these pre-works surveys is to ensure mitigation during the works is based on

the latest protected species information. This will also be required for any protected species licensing that may be identified as being necessary prior to commencement of works. These surveys will also provide an update on the presence and location of any INNS, the findings of which will inform the implementation of measures to prevent their spread into the wild and will be secured through the WEMP.

- 5.1.36 During the works and ongoing operation and maintenance Reasonable Avoidance Measures (RAM), including 15 m buffers around trees with bat roost suitability, will be implemented where possible.
- 5.1.37 Implementation of measures to avoid animals being injured or killed in working areas, such as through the inclusion of perimeter fencing and covering excavations or providing a means of escape, will exclude them from such areas and prevent them from becoming trapped or injured. Such measures will be included in the WEMP.
- 5.1.38 Good industry practice works methods will be set out in the WEMP and will include measures to minimise noise, lighting and vibration disturbance to protected and notable fauna. Measures will ensure that, where the Wider Works are carried out during key seasons for protected and notable fauna (e.g. the breeding bird season (typically March to August, inclusive) or reptile inactive season (typically November to February, inclusive)), appropriate controls are in place to safeguard species and ensure legal compliance. Soil storage and bunds will be secured to prevent their deterioration that would cause sedimentation into adjacent habitats.
- 5.1.39 The Wider Works design retains habitats, including woodland, species-rich marshy grasslands, grassland margins, watercourse and ditch margins, scrub and hedgerows. However, some temporary disturbance and minor loss (trees only).
- 5.1.40 **Table 5-2** provides a summary of the magnitude of impacts and likely significance of effects on IEFs during the works, taking into account the embedded mitigation.

Table 5-2 – Assessment of impacts and significance of effects of the Wider Works

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
Coedydd Derw a Safleoedd Ystlumod Meirion/ Meirionnydd Oakwoods and Bat Sites SAC  Coedydd De Dyffryn Maentwrog SSSI, Ceunant Llennyrch NNR and Llystyn Isaf SSSI	International (Very High)  National (High)	Habitat loss (temporary)	Works on the edge of this SAC, SSSI and NNR as part of the Wider Works will be temporary and minimal, comprising works to Tower 4ZC015 and provision of an access track, which may require strimming of overhanging branches and strimming of vegetation around the tower. The Wider Works site crosses over the SAC, SSSI and NNR between Towers 4ZC012 – 4ZC013, however this is over a ravine and no works will take place in the SAC, SSSI or NNR. There will be no habitat loss in Llystyn Isaf SSSI.	Low	Minor Adverse	No
		Habitat degradation - impacts to water quality through pollution and run off and air quality from dust (temporary)	There is potential for dust emissions, noise and vibration disturbance and impacts to water quality due to the proximity of Wider Works activities. Standard environmental protection measures will be implemented. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
		Injury or mortality of associated species	All trees in the SAC, SSSI and NNR will be protected and retained as part of the Wider Works. No trees with potential roost features (PRFs) suitable for bats have been identified. It is highly unlikely that roosting bats would be directly impacted, causing injury or mortality. Pre-works surveys will be carried out as required to support the baseline survey findings and inform any additional mitigation or licencing requirements.	Low	Minor Adverse	No
		Disturbance to associated species through noise, lighting, or visual disturbance (temporary)	No lighting will be required for the Wider Works site, proposed and noise levels will be kept to a minimum, being no higher than 95 decibels (dB). As described in <b>Chapter 2: Wider Works</b> , works will be scheduled during core (daytime) working hours.	Low	Minor Adverse	No
Afon Gwyrfai a Llyn Cwellyn SAC and SSSI	International (Very High) and National (High)	Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Hydrological connections exist between the Wider Works site and these designated sites via the natural drainage network. Standard environmental protection measures will be implemented during the works.	Very Low	Minor Adverse	No
		Disturbance to associated species through noise, lighting, or visual disturbance (temporary)	Otter are associated with these statutory sites and use water bodies and riparian habitats in the Wider Works site. No otter resting sites have been recorded in the Wider Works site and planned works (which are at height and comprise minor fibre wrap works) will not prevent otter movement across the landscape. Pre-works surveys will be carried out as required to support the baseline survey findings and inform any additional mitigation or licensing requirements to reduce the likelihood that otters are disturbed by the Wider Works.	Very Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
			<p>Atlantic salmon and floating water plantain are also designated features of these statutory sites. Atlantic salmon have been recorded both up and downstream from the Afon Gwyrfaï crossing during NRW surveys completed in 2018 and 2024 respectively. Both sites fall outside of the 2 km buffer (approximately 2.3 km upstream and 2.6 km downstream) but indicate that Atlantic salmon migrate pass the Afon Gwyrfaï crossing point. That said, the planned works (which are at height and comprise minor fibre wrap works with support netting to protect watercourses) reduce the likelihood that Atlantic salmon will be disturbed by the Wider Works.</p> <p>NRW macrophyte surveys were completed 120 m downstream from the Afon Gwyrfaï crossing point in 2015 with floating water-plantain not being identified. Given the lack of records in the Study Area and this species preference to lake habitats or small stream immediately downstream of lakes, they are assumed absent from the Wider Works area.</p> <p>Standard environmental protection measures will be implemented during the works and ensure their protection.</p>			
Corsydd Eifionydd/Eifionydd Fens SAC	International (Very High)	Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	A Wider Works access track is likely required on the edge of Corsydd Eifionydd/ Eifionydd Fens SAC west of Tower 4ZC081. There is potential for dust emissions and impacts to water quality due to the proximity of works activities. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Very Low	Minor Adverse	No
		Loss of FLH for marsh fritillary	The SAC is designated for its marsh fritillary butterfly and suitable FLH for this species is in the Wider Works site. No permanent habitat loss will be required for the Wider Works, vegetation management will take place in working areas, and will be left to re-establish. The use of suitable trackway or matting will limit damage to the existing habitat where it is appropriate for the temporary works, and vehicles will stay in defined working areas. Pre-works surveys to check for the presence of marsh fritillary larval webs will be carried out at a suitable time of year (mid to late August or September) prior to any works taking place in suitable habitat for this species (Rhôs pasture or marshy grassland habitat dominated by tussocks of purple moor-grass and various rush species), where their favoured food plant, devils bit scabious ( <i>Succisa pratensis</i> ) is also present. If marsh fritillary are subsequently confirmed to be present, then further measures will be taken to avoid damaging food or larval plants.	Low	Minor Adverse	No
Pen Llyn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC	International (Very High)	Habitat degradation- impacts to water quality through pollution and run off (temporary)	There are hydrological connections between these statutory designated sites and the Wider Works site. Standard environmental protection measures will be implemented during the works. This will include suitable measures to reduce spillage risk and water pollution risk.	Very Low	Minor Adverse	No



Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
Morfa Harlech a Morfa Dyffryn SAC Morfa Harlech SSSI and Morfa Harlech a Morfa Dyffryn NNR  Cors Gyfelog SSSI and NNR  Pant Cae Haidd SSSI	National (High)	Temporary disturbance to qualifying species of the (otter, breeding waders and wintering birds) through noise, visual disturbance or lighting	Otters are associated with these statutory sites and use water bodies and riparian habitats in the Wider Works site. No otter resting sites have been recorded in the Wider Works site and the Wider Works will not prevent otter movement across the landscape. No night time works will be carried out, when otters are generally more active and artificial lighting will not be required. Pre-works surveys will be carried out as required to support the baseline survey findings and inform any additional mitigation or licensing requirements to reduce the likelihood that otters are disturbed by the Wider Works.	Very Low	Minor Adverse	No
Glynllifon SAC and SSSI Coedydd Dyffryn Ffestiniog (Gogleddol) SSSI Dolorgan Barn SSSI	International (Very High) and National (High)	Temporary disturbance to qualifying species of the (lesser horseshoe bat) through noise, visual disturbance or lighting	The SAC and SSSIs comprise maternity roosts and hibernation sites for lesser horseshoe bats and the Wider Works site is in the potential CSZ for this species. No night time working is required for the Wider Works and artificial lighting will not be required as works will be completed in day light hours. Noise levels will be kept to a minimum, being no higher than 95 db.	Very Low	Minor Adverse	No
Migneint-Arenig-Dduallt SPA and SSSI Eryri SSSI	International (Very High) and National (High)	Temporary disturbance to qualifying species (hen harrier, chough, merlin, peregrine) through noise or visual disturbance	Potential impacts from noise and visual disturbance produced by the Wider Works could occur should these species nest in proximity (species dependant) to the Wider Works including using pylons for nesting sites (notably peregrine). However, the Wider Works site is 1.68 km from Migneint-Arenig-Dduallt, and provides comparatively suboptimal nesting habitat (pylons) to that present in the designate site. Furthermore, should any nesting peregrines use pylons in or adjacent to the Wider Works site, it will likely be fewer than 1% of the national population, and thus not significant. Standard environmental protection measures will be implemented during the works where necessary and will include measures to reduce noise and visual disturbance.	Low	Minor Adverse	No
Afon Ddu SSSI	National (High)	Temporary disturbance to qualifying species of the (freshwater pearl mussel, salmon and sea-trout) through impacts to water quality	Although this statutory site is upstream of the Wider Works, impacts to connecting watercourses downstream could potentially impact migratory salmonids and therefore the qualifying features of these SSSI. Standard environmental protection measures will be implemented during the works. This will include suitable measures to reduce spillage risk and water pollution risk.	Very Low	Minor Adverse	No
Llyn Padarn SSSI	National (High)	Temporary disturbance to qualifying species of the (Arctic charr ( <i>Salvelinus alpinus</i> ) and Floating water-plantain) through impacts to water quality	Although this statutory site is upstream of the Wider Works, impacts to connecting watercourses downstream could potentially impact the qualifying features of these SSSI. Standard environmental protection measures will be implemented during the works. This will include suitable measures to reduce spillage risk and water pollution risk.	Very Low	Minor Adverse	No
Afon Dwyfach cWS	County (Medium)	Temporary habitat disturbance and loss	The Wider works will result in localised temporary habitat disturbance through the use of vehicles and machinery.	Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
Afon Rhythallt Mosaic cWS Below Bron Haul cWA Bont y Chrychddwr cWS Braich-y-saint cWS Bryncir cWS Bryn-ychain cWS Cae Haidd cWS Carmel cWS Coed Bryn-twr / Wern cWS Coed yr Eglwys cWS Derwin cWS Derwyn-fawr cWS Dolwar Heath cWS Dol-wenith cWS Ffynnon Beuno cWS Glanrafon Bach cWS Glan-yr-afon cWS Gwernddwryd cWS Hafod-rhug isaf cWS Llecheiddior Ganol cWS  Llystyn Isaf cWS  Moel Bron-y-rhiw (West) cWS North of Caerau cWS Tan y Coed Terrace cWS Ty'n-y-berllan cWS West bank of Afon Dwyfor cWS Ymwllch Fawr cWS Ynys-ddu cWS Ystumcegid-isaf cWS		Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Temporary habitat strimming will also be required to enable access to tower working areas, installation of scaffold and the creation of discrete laydown and EPZ areas.  The use of a suitable temporary ground protection trackway or matting will limit damage to the existing habitat where appropriate and ensure that vehicles use the same route through the Wider Works site and stay in defined working areas.  All habitats will be reinstated or allowed to re-establish on completion. Habitats that form a component of these WS and cWS comprise semi-natural woodland, coniferous woodland, semi-improved neutral, acid and marshy grassland and acid and neutral flush.			
Ancient woodland	Up to National (High)	Habitat loss. Permanent and temporary.  Habitat degradation- impacts to water quality through pollution and run	In the Wider Works site, the working area for Tower 4ZC007 is on the edge of ancient woodland, no works will take place or vegetation removal or strimming in this ancient woodland. Access is not required through this woodland. An existing access from Tower 4ZC015 – 4ZC016 that passes through ancient woodland may be temporarily utilised by ATV,	Low	Minor Adverse	No



Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
		off and air quality from dust (temporary)	trimming of overhead branches may be required to allow access but no other vegetation or trees will be removed.			
Veteran or ancient trees	Up to National (High)	Habitat degradation-impacts to water quality through pollution and run off and air quality from dust (temporary)	<p>There are four veteran trees in the Wider Works site. These trees will not be removed and will be protected using measures set out in the High Level Arboricultural Impact Assessment report (<b>Volume 8, Appendix 6.5.H: High Level Arboricultural Impact Assessment</b>).</p> <p>Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.</p>	Low	Minor Adverse	Yes
HoPI Coastal floodplain grazing marsh	County (Medium)	<p>Habitat fragmentation and loss.</p> <p>Habitat degradation-impacts to water quality through pollution and run off and air quality from dust (temporary)</p>	<p>Vegetation management of this habitat will take place in working areas to allow access. However this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish.</p> <p>Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.</p>	Low	Minor Adverse	No
HoPI Lowland dry acid grassland/purple moor-grass and rush pasture	County (Medium)	<p>Habitat fragmentation and loss.</p> <p>Habitat degradation-impacts to water quality through pollution and run off and air quality from dust (temporary)</p>	<p>Vegetation management of this habitat will take place in working areas to allow access. However this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish. Between Towers 4ZC017 – 4ZC021 habitat will be protected through the use of an appropriate temporary ground protection trackway or matting to limit damage to the existing habitat and to ensure that vehicles use the same route through the area and stay in defined working areas.</p> <p>Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.</p>	Low	Minor Adverse	No
HoPI Lowland fen	County (Medium)	<p>Temporary habitat disturbance and loss.</p> <p>Habitat degradation-impacts to water quality through pollution and run off and air quality from dust (temporary)</p>	<p>Vegetation management of this habitat will take place in working areas to allow access. However, this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish. Between Towers 4ZC017 – 4ZC021 habitat will be protected through the use of an appropriate temporary ground protection trackway or matting to limit damage to the existing habitat and to ensure that vehicles use the same route through the area stay in defined working areas.</p> <p>Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.</p>	Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
HoPI Lowland heathland	County (Medium)	Temporary habitat fragmentation, disturbance and loss. Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Vegetation management of this habitat will take place in working areas to allow access. However, this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish. Between Towers 4ZC017 – 4ZC021 habitat will be protected through the use of an appropriate temporary ground protection trackway or matting to limit damage to the existing habitat and to ensure that vehicles use the same route through the area stay in defined working areas. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Very Low	Negligible	No
HoPI Lowland meadow	County (Medium)	Temporary habitat disturbance, fragmentation and loss. Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Vegetation management of this habitat will take place in working areas to allow access. However, this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Very Low	Negligible	No
HoPI Semi-natural broadleaved woodland (Upland oakwood, Lowland mixed deciduous woodland, Wet woodland and Wood pasture and parkland)	County (Medium)	Habitat, fragmentation, disturbance and loss. Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	There will be no loss of woodland in the Wider Works site. No loss of trees or trimming of trees in HoPI woodlands. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
HoPI Running water, including wet ditches	Larger watercourses - County (Medium) Smaller watercourses - Local (Low) Wet ditches or drains (smaller watercourses) – Local (Low)	Habitat loss and fragmentation Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	There will be no loss of running water or fragmentation of running water in the Wider Works site. Culverts will need to be replaced in some locations however this only applies where necessary and on small streams and wet ditches. Works to replace culverts will follow measures to ensure watercourses and ditches are not damaged and habitats will be reinstated. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
HoPI Hedgerows and Cloddiau	County (Medium)	Temporary and permanent habitat loss. Habitat degradation- impacts to water quality through	There will be no loss of hedgerows or Cloddiau in the Wider Works site. Standard environmental protection measures will be implemented during the works. This will include suitable	Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
		pollution and run off and air quality from dust (temporary)	measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.			
HoPI Standing water	Local (Low)	Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	No ponds will be directly affected. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
Non-HoPI Woodland (broadleaved semi-natural woodland, broadleaved plantation woodland, mixed semi-natural woodland, mixed plantation woodland, scattered trees)	Local (Low)	Habitat disturbance, fragmentation and loss. Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	A small number of trees will be lost to facilitate access in broadleaved semi-natural woodland at two locations only: Towers 4ZC023 and 4ZC046. There will be no other loss of woodland in the Wider Works site. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
Non-HoPI Neutral semi-improved grassland	Local (Low)	Habitat disturbance, fragmentation and loss. Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Vegetation management of this habitat will take place in working areas to allow access. However this will be temporary and be minimised where practicable and vegetation will be allowed to re-establish. Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
HoPI in the Wider Works site or in a 50 m buffer of the Wider Works site or are hydrologically linked.	County (Medium)	Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary)	Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk.	Low	Minor Adverse	No
Protected or notable terrestrial invertebrates	Up to County (Medium) for marsh and pearl-bordered fritillary ( <i>Boloria euphrosyne</i> ). Local (Low) for general assemblage	Loss and fragmentation of habitat used by terrestrial invertebrates resulting in species mortality - permanent and temporary. Habitat degradation due to dust and other pollutants (temporary)	There are habitats present in the Wider Works site that could support notable terrestrial invertebrates, including marsh fritillary and small pearl-bordered fritillary. There will be no permanent habitat loss, only vegetation management at tower base locations to enable access. Vegetation will be allowed to re-establish. The use of suitable trackway or matting will limit damage to the existing habitat where appropriate and vehicles will remain in defined working areas. Pre-works surveys to check for the presence of marsh fritillary larval webs will be carried out at a suitable time of year (mid to late August or September) prior to any works taking place in suitable habitat for this species (Rhôs pasture or marshy grassland habitat dominated by tussocks of purple moor-grass and various rush species), where their favoured food plant, devils bit scabious is also present. If marsh fritillary are subsequently confirmed to be present, then further measures will be taken to avoid damaging food or larval plants.	Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
			Standard environmental protection measures will be implemented during the works. Details regarding effects on marsh fritillary and small pearl-bordered fritillary are provided in <b>Volume 3: Bryncir, Chapter 5: Ecology and Nature Conservation</b> .			
Aquatic macroinvertebrates	National (High) importance for freshwater pearl mussel  District (Medium) importance for the scarce blue-tailed damselfly, the Iron Blue Mayfly and the nationally important species  Local (Low) for all other species	Habitat loss (temporary and permanent) through construction of works access roads over watercourses	<p>Thirty-two watercourses are being crossed to provide temporary and upgraded permanent access to the towers across the Wider Works. All existing crossing points (culverts and Terrafirma panels) will be tested for their suitability and upgraded where required. Existing crossing points are being utilised where possible and the aquatic habitat associated with them are already deemed impacted, the habitat loss associated with these works are likely to be negligible with the macroinvertebrate assemblage able to recolonise from both up and downstream.</p> <p>The identified macroinvertebrate assemblage from the Wider Works are common and widespread in the area (see <b>Volume 8, Appendix 6.5.B: Aquatic Survey Report</b>). Further, these crossings will be small in the context of the extent of the watercourses with habitats being reinstated after the works. The macroinvertebrate community will be able to naturally recolonise, and this is deemed a negligible impact.</p> <p>The Freshwater Pearl Mussel population in the Afon Ddu and its subsequent rivers (Afon Henwy and Afon Dwyfor) are not being crossed for access and will not be impacted.</p>	Very Low	Negligible (for Fresh water pearl mussel – reduced on professional judgement – and all other species)	No
		Direct impact on species assemblage through disturbance and mortality (Temporary) during construction of temporary access roads	<p>Construction of the one new watercourse crossing and potential upgrades to the existing 31 crossings, will require watercourses to be culverted (new or upgraded) or the installation of Terrafirma panels to enable access for works vehicles for the works.</p> <p>The identified macroinvertebrate assemblage from across the Wider Works are common and widespread in the area (see <b>Volume 8, Appendix 6.5.B: Aquatic Survey Report</b>). Further, these crossings will be small in the context of the extent of the watercourses with habitats being reinstated after the works. The macroinvertebrate community will be able to naturally recolonise, and this is deemed a negligible impact.</p> <p>The Freshwater Pearl Mussel population in the Afon Ddu and its subsequent rivers (Afon Henwy and Afon Dwyfor) are not being crossed for access and will not be impacted.</p>	Very Low	Negligible (for Fresh water pearl mussel – reduced on professional judgement – and all other species)	No
		Habitat degradation - impacts to water quality through pollution of watercourses leading to mortality of macroinvertebrates.  Temporary (short-term), reversible	Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk, including where practicable, 10 m stand-off buffers from watercourses.	Very Low	Negligible (for Fresh water pearl mussel – reduced on professional judgement – and all other species)	No



Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
Aquatic macrophytes	County (Medium) importance for pale scalewort Local (Low) importance for all other species	Habitat loss (temporary and permanent) through construction of access roads over watercourses	<p>Thirty-two watercourses are being crossed to provide temporary and permanent works access to the towers across the Wider Works. All existing crossing points (culverts and Terrafirma panels) will be tested for their suitability and upgraded where required. Existing crossing points are being utilised where possible and the aquatic habitats associated with them are already deemed impacted and the habitat loss associated with these works are likely to be negligible with the macrophyte assemblage able to recolonise from both up and downstream.</p> <p>The identified macrophyte assemblage from the Wider Works are common and widespread in the area except for the pale scalewort (see <b>Volume 8, Appendix 6.5.B: Aquatic Survey Report</b>).</p> <p>Further, these crossings will be small in the context of the extent of the watercourses with habitats being reinstated after the works. The macrophyte community will be able to naturally recolonise, and this is deemed a negligible impact.</p>	Very Low	Negligible (for all species)	No
		Direct impact on species assemblage through disturbance and mortality (Temporary) during construction of temporary access roads	<p>Construction of the one new watercourse crossing and potential upgrades to the existing 31 crossings, will require watercourses to be culverted (new or upgraded) or the installation of Terrafirma panels to enable access for works vehicles for the works.</p> <p>The identified macrophyte assemblage from across the Wider Works are common and widespread in the area except for the pale scalewort (see <b>Volume 8, Appendix 6.5.B: Aquatic Survey Report</b>). Further, these crossings will be small in the context of the extent of the watercourses with habitats being reinstated after the works. The macrophyte community will be able to naturally recolonise, and this is deemed a negligible impact.</p>	Very Low	Negligible (for all species)	No
		Habitat degradation- impacts to water quality through pollution (i.e. dust, oil, sediments spills from, surface run-off, pre-works on compounds/site clearance and general plant movement) leading to mortality of macroinvertebrates. Temporary (short-term), reversible	Standard environmental protection measures will be implemented during the works. This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk, including where practicable, 10 m stand-off buffers from watercourses.	Very Low	Negligible (for all species)	No
Fish	National (High) importance for the migratory fish assemblage	Habitat degradation- impacts to water quality through pollution (i.e. dust, oil, sediments spills from, surface run-off, pre-works on	Standard environmental protection measures will be implemented during the works . This will include suitable measures to suppress dust, reduce site runoff and reduce spillage risk and water pollution risk, including where practicable, 10 m stand-off buffers from watercourses.	Very Low	Minor Adverse for Nationally important species	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
	Local (Low) importance for all other species	compounds/site clearance and general plant movement) leading to mortality of fish. Temporary (short-term), reversible			Negligible for all other species	No
		Direct mortality or disturbance to fish species due to the installation and/or updating of watercourse crossings. Temporary (short-term), reversible	Where new or updating existing watercourse crossings are proposed, there is a risk that this work would result in disturbance and/or mortality to fish species through the removal of aquatic habitat.  The specific type of watercourse crossing being installed is being determined following a visit by engineers. As such, this potentially presents an unknown impact to a single cohort of both Nationally and Locally important fish species and therefore additional mitigation may be required depending on the design.	Low	Moderate Adverse for Nationally important species  Negligible for all other species	Yes  No
		Disturbance to fish species from work activities (i.e. lighting, noise, vibration, human activity). Temporary	Works taking place near to, or over watercourses as part of the Wider Works could disturb fish during migration and spawning.  Existing measures are in place to ensure disturbance is kept to a minimum such as: <ul style="list-style-type: none"><li>A minimum of 10 m from watercourses (bank top) where practicable.</li><li>Where lighting is required, it will conform to best practice guidelines with respect to minimising light spill into adjacent habitats and preventing disturbance to species.</li><li>Works over watercourses will install support netting to protect watercourses during oversailing.</li></ul> Works at towers that may involve works over main/large watercourses (Tower 4ZC023 – 4ZC027 (Nant yr Efail), Tower 4ZC048 (Afon Bontfaen), Tower 4ZC070 (Afon Dwyfach), Tower 4ZC081 (tributary of Afon Dwyfach), Tower 4ZC093 (Afon Crychddwr), 4ZC097 (trib of Afon Llyfni), 4ZC109 (Afon Llifon)) could disturb the migration and/or spawning of fish species which may result in a single cohort of both Nationally and Locally important fish species being impacted.	Low	Moderate Adverse for Nationally important species  Negligible for all other species	Yes  No
Breeding birds	Local (Low)	Loss and fragmentation of habitats used by breeding birds, resulting in species mortality.  Direct loss of nests and young through tree and vegetation removal or reduction, which could result in injuring or killing birds.	Breeding bird surveys were not completed for Wider Works. Low numbers of common birds of no or low conservation concern may use the habitats in or adjacent to these components for occasional foraging or nesting but are unlikely to depend on these for their survival or proliferation, and will have access to habitat of equal and better quality in the surrounding landscape.  Schedule 1 (WCA) birds could be present, including using pylons for nesting sites (notably peregrine). Standard environmental protection measures will be implemented during the works to minimise noise, lighting and vibration	Medium	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
		Temporary noise and visual disturbance, including to nesting WCA Schedule 1 birds such as peregrine	disturbance to birds. These measures will ensure that, where works are carried out during the breeding bird season (typically March to August, inclusive), disturbance to breeding birds in adjacent and retained habitats will be minimised.			
Non-breeding birds	Local (Low)	Noise or visual disturbance (temporary).	Surveys for non-breeding (outside the cored breeding bird season) were not completed for the Wider Works. Low numbers of common birds of no or low conservation concern may use the habitats in or adjacent to these components for occasional foraging or sheltering but are unlikely to depend on these for their survival or proliferation and will have access to habitat of equal and better quality in the surrounding landscape. Standard environmental protection measures will be implemented during the works to minimise noise, lighting and vibration disturbance to birds. These measures will ensure that disturbance to birds in adjacent and retained habitats will be minimised.	Very Low	Negligible	No
Bats	Foraging and commuting habitat for the overall bat assemblage – Regional (Medium) Importance in the SAC and County or District (Medium)	Direct loss of roosts through tree removal, which could result in injuring or killing bats (permanent) Disturbance to roosting bats due to noise or lighting during the works (temporary) Loss or severance of foraging or commuting habitat (e.g. hedgerows, watercourses, grasslands) (temporary and permanent)	Tree removal will only be required where necessary and at the following towers 4ZC023, 4ZC045, 4ZC046, 4ZC059, 4ZC061. Trees will be trimmed at 4ZC006, 4ZC016, 4ZC026 and 4ZC060. Trees with PRFs are present in working area at tower 4ZC023 (groups of trees), 4ZC046 (one tree), 4ZC059 (one tree), 4ZC060 (group of trees), 4ZC061 (five trees). Further surveys will be required to determine presence/absence of roosting bats for any trees with PRFs which will be removed or trimmed. Should roosting bats be present then a mitigation licence from NRW will be required. Standard environmental protection measures will be implemented during the works. Impacts on foraging and commuting bats will be limited and managed in accordance with the measures to be set out in the WEMP. Impacts on habitats suitable for foraging and commuting bats will be largely temporary.	Low	Minor Adverse	No
Badger	Local (Low)	Damage or disturbance (noise, vibration or lighting) to active badger setts which could result in injuring or killing badgers. Habitat loss or fragmentation (temporary)	Two badger setts (main and subsidiary) were recorded in the Wider Works site.. The subsidiary badger sett will not require closure. The main sett may be subject to disturbance. A pre-works badger survey will be carried out to confirm the presence or absence of badger setts up to 30 m of Wider Works locations. Where an active badger sett is at risk of being disturbed or destroyed then an NRW licence would be required, and mitigation measures would be updated accordingly. The Wider Works will not result in any permanent loss of badger foraging habitat and there will be no fragmentation of badger territory or restrict access to foraging and water resources.	Low	Minor Adverse	Yes
Otter	District (Medium)	Habitat loss or degradation where the Wider Works	Otter presence was recorded in watercourses 6.40, 6.41 and 6.43 in the Wider Works site; no holts were identified. No	Low	Minor Adverse	No



Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
		cross or lie near to watercourses (permanent and temporary). Disturbance to commuting, foraging or resting otter through noise, lighting or visual disturbance in or near to watercourses (temporary). Habitat degradation impacts to water quality through pollution of watercourses (temporary)	works are proposed in the vicinity (a buffer of at least 10 m) of watercourse 6.40 or 6.43. these watercourses. A suitable buffer of a least 10 m from watercourse 6.41 will be maintained and follow standard environmental protection measures will be implemented during the works. Pre-commencement surveys will be carried out in advance of the works to check if the distribution of otter remains the same and that any mitigation proposed is appropriate. Connectivity for otter will be maintained along water courses. Impacts on foraging and commuting otter will be limited and managed in accordance with the measures to be set out in the WEMP. Impacts on habitats suitable for foraging and commuting otter will be largely temporary.			
Water vole ( <i>Arvicola amphibius</i> )	District (Medium)	Disturbance to commuting, foraging or resting water vole through noise, lighting or visual disturbance in or near to watercourses (temporary). Habitat degradation impacts to water quality through pollution of watercourses (temporary)	Water vole presence was recorded in watercourses 6.7a, 6.8, 6.9, 6.10, 6.11, 6.17, 6.20, 6.31 and 6.38 in the Wider Works site. There will be no Wider Works in 10 m of watercourses 6.8, 6.20 and 6.31. Pre-commencement surveys will be carried out in advance of the works to check if the distribution of water vole remains the same and that any mitigation proposed is appropriate. Standard environmental protection measures will be implemented during the Wider Works.	Low	Minor Adverse	No
Great crested newt ( <i>Triturus cristatus</i> )	District (Medium)	Loss or fragmentation of terrestrial and aquatic habitats used by great crested newts for foraging, breeding, or shelter (temporary). Incidental killing, injury or disturbance of great crested newts present in habitats on Site	One pond (P6.68) within 50 m of the Wider Works site returned a positive eDNA result (north of Towers 4ZC008 and 4ZC009) , confirming presence, and further pre-works surveys will be required to determine population size and presence/absence surveys on ponds in 250 m with habitat connectivity to the Wider Works. There will be no permanent terrestrial or aquatic habitat loss in the Wider Works site. Impacts are associated with vegetation management only and for access requirements. Mitigation for great crested newt will be carried out under a European Protected Species (EPS) Mitigation Licence from NRW where necessary. Standard environmental protection measures will be implemented during the works at this location.	Low	Minor Adverse	No
Other mammals (hedgehog ( <i>Erinaceus europaeus</i> ), brown hare ( <i>Lepus europaeus</i> ), and polecat ( <i>Mustela putorius</i> )) and common amphibians	Local (Low)	Permanent and temporary loss and disturbance of habitats which may be used by these species	Other mammals (as described) are potentially present throughout the Wider Works site. There will be no permanent habitat loss. Temporary vegetation management will take place in habitats suitable to support these species. Precautionary working methods that will be adhered to for other species, including badger, reptiles and birds when impacting areas of suitable habitat (e.g. hedgerows, woodland, scrub, grasslands) will also be of benefit to other mammals and common amphibians.	Low	Minor Adverse	No

Ecological feature	Importance (value)	Description of impact	Assessment	Magnitude of impact	Effect category	Significant effect (yes/no)
Reptiles	Local (Low)	Loss or fragmentation of terrestrial and aquatic habitats used by reptiles for foraging, breeding, or shelter. Incidental killing, injury or disturbance of reptiles present in habitats on Site (temporary).	No reptile surveys have taken place for Wider Works but incidental sightings of adder have been recorded between towers 4ZC069 and 70. There will be no permanent loss of suitable reptile habitat in the Wider Works site. Temporary vegetation management will take place in habitats suitable to support reptile. Precautionary working methods will be adhered to in areas of suitable reptile habitat. Works in areas suitable for reptiles will be carried out at an appropriate time of year, concordant with requirements for other species (such as nesting birds), in a phased approach.	Low	Minor Adverse	No
Notable flora, fungi and lichen	Up to County (Medium)	Disturbance or loss of notable flora, fungi and lichen due to habitat loss (temporary). Habitat degradation- impacts to water quality through pollution and run off and air quality from dust (temporary).	. Waxcaps were identified between towers 4ZC013 and 16. There will be no permanent habitat loss in the Wider Works site. Impacts are associated with vegetation management only and for access requirements. Care will be taken to avoid areas where waxcaps are present. Standard environmental protection measures will be implemented during the works.	Low	Minor Adverse	No

## Mitigation and Residual Effects

### Additional Mitigation

- 5.1.41 Additional mitigation measures are measures that will be carried out to further reduce the magnitude of effects for certain ecological features and are in addition to embedded mitigation measures.
- 5.1.42 Additional mitigation is required where significant effects are identified following the application of embedded mitigation measures.

### Marsh fritillary butterfly

- 5.1.43 Additional mitigation measures will minimise any potential adverse effects on marsh fritillary butterflies, should they be present in the Wider Works site. Works have the potential to kill or injure these butterfly species (if present) through the disturbance or clearance of suitable vegetation, including plants used for egg laying and feeding. Temporary loss and disturbance of vegetation used by these butterflies could also reduce the availability of suitable foodplants. Additional mitigation measures will comprise:
- A pre-works check will be carried out in areas of suitable habitat at the appropriate time of year to look for any visible larval webs, with a view to avoid such areas, if possible. The use of appropriate temporary ground protection matting, to limit damage to existing habitat and to ensure that vehicles use the same route through the works site. A suitably experienced ecologist will be on site to guide the implementation of the works access route through any potential suitable habitat, with a view to avoid or reduce potential impacts where possible.
  - Patches of dense or abundant devil's bit scabious (*Succisa pratensis*) are avoided (i.e. routed around or avoided by temporary plant) in order to preserve the larval food plant of the marsh fritillary. Areas required for preservation would be identified on the ground by an Ecological Clerk of Works (ECoW) prior to works commencing in a given location.
  - Where devil's bit scabious is identified in works areas, translocation of the larval webs and plants that contain marsh fritillary eggs may be required, although in general the simpler approach would be to micro-site the works around any identified populations.
  - Once works are complete the works areas would then be required to be reinstated to the condition it was in prior to the works.
  - Pre-works surveys to check for the presence of marsh fritillary larval webs will also be carried out at a suitable time of year (mid to late August or September (Ref 5.36)) prior to any works taking place. If confirmed to be present, then further measures will be taken to avoid damaging food plants where they are present.
  - Machinery or materials will not be stored on site in areas of suitable habitat.
  - Suitable timings of works, where practicable, to avoid impacting foodplants when eggs or larval webs may be present.
  - Mitigation measures will be detailed in the WEMP.
- 5.1.44 With the implementation of additional mitigation, the magnitude of impact to marsh fritillary is Very Low, with a resulting Negligible effect, which is not significant.

## Roosting bats

- 5.1.45 Further pre-works surveys will be carried out to support the baseline survey findings for Wider Works where tree removal or reduction cannot be avoided, including where trimming of trees for access will be required. Where impacts to roosting bats cannot be avoided a licence from NRW will be obtained and suitable mitigation put in place. Mitigation will likely include the requirement to install bat boxes in the area.
- 5.1.46 Where the removal or reduction of trees with PRFs but not confirmed as supporting bat roosts, these trees will be section felled in accordance with an approved Method Statement, under an ecological watching brief delivered by a suitably licensed ecologist.
- 5.1.47 With the implementation of additional mitigation under a NRW licence, if required, the magnitude of impact to roosting bats will be Very Low for Wider Works with a resulting Negligible effect, which is not significant.

## Badger

- 5.1.48 At the Wider Works site, disturbance could occur to a main badger sett (as detailed in the confidential badger **Volume 8, Appendix 6.5.D: Ecology Report: Badger Survey**) and may require an NRW disturbance licence, requiring mitigation including timing restrictions on the works in this location to ensure the sett is not disturbed between November and July. Prior to the works options for moving works to at least 30 m from the sett to avoid disturbance if possible, or minimising works required within this distance to a level that would not affect the sett will be explored.
- 5.1.49 Pre-works surveys will be carried out to confirm the latest status of each sett (active to disused), presence of any new setts, and which setts will be directly impacted, not directly impacted but at risk of disturbance, and not impacted directly or disturbed.
- 5.1.50 To minimise disturbance at other badger setts, 30 m exclusion zones around sett entrances will be enforced. The exclusion zones will be delineated by appropriate above ground fencing or ground markings, agreed with the ECoW, who will manage works activities alongside the contractor(s). Where the 30 m exclusion zones cannot be adhered to then a licence from NRW may be required and will be assessed on a case-by-case basis by the appointed experienced ecologist, depending on the works proposed in that area.
- 5.1.51 With the implementation of additional mitigation under a NRW licence, if required, the magnitude of impact to badger for Wider Works will be Low, with a resulting Negligible effect, which is not significant.

## Water vole

- 5.1.52 Pre-works surveys will be required to support baseline survey findings for Wider Works.
- 5.1.53 Any replacement of culverts or watercourse crossings will be designed to maintain downstream flows and to allow continued and unobstructed passage for mammals using river corridors. Alternatives such as temporary clear span bridges or alternative access routes will be investigated to see if water vole burrows can be avoided. At watercourses where water vole are present and will be affected (habitat disturbance, temporary loss of habitat), a mitigation licence from NRW will be required. The licence will detail the appropriate timing and an ecological watching brief to permit the temporary dispersal of water vole from the working area. Habitat enhancement in the vicinity of the culvert may be required in advance of works in these instances. Habitat will be reinstated or enhanced following completion of the works. The WEMP details measures to prevent and control pollution during the works.

- 5.1.54 With the implementation of additional mitigation under a NRW licence, if required, the magnitude of impact to water vole will be Low, with a resulting Minor Adverse effect, which is not significant.

### **Otter**

- 5.1.55 Pre-works surveys will be carried out to support the baseline survey findings for Wider Works. Where direct impacts to newly identified otter resting places (should they be present) cannot be avoided a licence from NRW will be obtained and suitable mitigation put in place.
- 5.1.56 Where indirect impacts such as disturbance to newly identified otter resting places are unavoidable, further mitigation will be put in place, such as temporary acoustic fencing.
- 5.1.57 With the implementation of additional mitigation, the magnitude of impact to otter is Very Low, with a resulting Negligible effect, which is not significant.

### **Great crested newt**

- 5.1.58 One pond in the Wider Works site returned a positive eDNA result, confirming great crested newt presence, and further pre-construction surveys will be required to determine the status of this species in other areas of the Wider Works site, and the size of the populations present.
- 5.1.59 Mitigation for great crested newt will be carried out under an EPS Mitigation Licence from NRW. Mitigation will be specified in the licence but may require the trapping and translocation of great crested newts from working areas and access routes within 250 m of ponds confirmed to support this species. In this instance, a suitable translocation area would need to be identified as part of the licence.
- 5.1.60 With the implementation of additional mitigation, the magnitude of impact to great crested newt is Very Low, with a resulting Negligible effect, which is not significant.

### **Fish**

- 5.1.61 Pre-construction fish rescues will be required at all temporary and permanent watercourse crossings (including both new and updated culverts). These surveys will need to be completed immediately before culvert installation to ensure all fish within the impacted area are safely removed to avoid injury and/or mortality.
- 5.1.62 Post-construction fish rescues will also be required during the decommissioning of all temporary watercourse crossings. These surveys will need to be completed immediately before culvert removal to ensure all fish within the impacted area are safely removed to avoid injury and/or mortality.
- 5.1.63 Where the new and updated culverts are proposed for watercourse crossings, culvert design will need to comply with best practise for fish passage which involves installing either box culverts or bottomless arch culverts. Where this is not possible then the culvert invert will need to be set below the existing watercourse bed to ensure continued longitudinal connectivity and fish passage through the culvert.
- 5.1.64 Pre-construction fish surveys are required at the drain of Afon Dwyfach adjacent to 4ZC071 to support the baseline findings and inform any mitigation requirements given that the Tower Working Area is within 10 m of this watercourse.
- 5.1.65 Pre-construction fish habitat surveys are required where Tower Working Areas are proposed to be within 10 m of a watercourse (4ZC070 (Afon Dwyfach), 4ZC093 (Afon Crychddwr), 4ZC109 (Afon Lilfon), 4ZC081 (Trib of Afon Dwyfach) and 4ZC071 (drain of

Afon Dwyfach)) and at all temporary and permanent watercourse crossings (including both new and updated culverts). Results will support the baseline survey findings and inform the presence of suitable spawning habitat and any additional mitigation requirements.

5.1.66 In watercourses deemed suitable for the migratory fish assemblage, works near (Tower Working Areas) or in water (temporary and permanent watercourse crossings) will need to be completed during suitable times of year to avoid the below ecological sensitive windows (migration) where possible. However, where these species are absent, these timings will not need to be considered. These timings represent worst case scenarios that account for environmental variability that trigger the cues in migration i.e. temperature and flow. Consultation with NRW personnel will streamline these months based on local/expert knowledge on migration runs and identify months that represent the least possible ecological harm.

- Atlantic salmon (smolt): March to May.
- Atlantic salmon (adult – main run): August to November.
- Sea trout (smolt): March to May.
- Sea trout (adult): June to October.
- River lamprey (adult): October to December.
- River lamprey (transformer): January to March.
- European eel (elver/glass eel): April to October.
- European eel (silver eel): August to October.

5.1.67 Where suitable spawning habitat is found for the protected migratory fish assemblage, then suitable timings of works, where practicable, are recommended to avoid impacting the spawning of these species (see below). However, where this habitat is absent, these timings will not need to be considered.

- Brown/sea trout – October to December.
- Atlantic salmon – November to December.
- Brook lamprey – March to April.
- River lamprey – March to April.

5.1.68 With the implementation of this additional mitigation, the magnitude of impact to the migratory fish assemblage is Very Low, with a resulting Minor Adverse effect, which is not significant.

### **Biosecurity Management Plan**

5.1.69 The implementation of a Biosecurity Management Plan that will set out procedures to ensure that no INNS are brought into the Wider Works area or areas of existing INNS are spread, will demonstrate compliance with legislation. Pre-works surveys will be carried out to provide an update on the presence and location of any INNS previously identified. This will inform the implementation of measures to prevent their further spread, such as biosecurity measures, exclusion zones or treatment. These procedures will be outlined in the WEMP.



## Monitoring

### Pre-works

- 5.1.70 Pre-works surveys will be carried out during the appropriate seasons prior to the Wider Works. These will inform detailed design where needed, provide up to date status of protected species that require mitigation during site clearance, and inform any protected species licensing that may be required should species distribution change or detailed design result in licencing requirements for species such as otter.

### Post-Works

- 5.1.71 Post-works monitoring will be carried out in accordance with protected species licences granted for the works.

## Summary

- 5.1.72 The assessment concludes that, with the incorporation of embedded and additional mitigation measures, significant effects are unlikely for Statutory and Non-Statutory nature conservation sites, ancient woodlands, and HoPI within the Wider Works site and Study Area. Similarly, significant effects are considered unlikely for protected and notable species and habitats identified within the Wider Works site and study area.

## 5.2 Historic Environment

- 5.2.1 This section presents an assessment of the likely Historic Environment effects that could arise from the proposed works as described in **Chapter 2: Wider Works**.

- 5.2.2 This section is supported by appendices as listed below:

- **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance.**
- **Volume 8, Appendix 1.4.A: Topic Assessment Methodology.**
- **Volume 8, Appendix 6.5.I: Historic Environment Desk Based Assessment (Wider Works).**
- **Volume 8, Appendix 6.5.J: Gazetteer of Historic Assets and Archaeological Investigations (Wider Works).**

## Legislation and Planning Policy

- 5.2.3 This section summarises the legislation and planning policy framework that is relevant to the Historic Environment assessment. Details are in **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance**.

### Legislation

- 5.2.4 The following legislation was relevant to Historic Environment:

- Ancient Monuments and Archaeological Areas Act 1979 (Ref 5.37).
- Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref 5.38).
- Historic Environment (Wales) Act 2023 (Ref 5.39).

## National Policy

5.2.5 The following national policy was relevant to Historic Environment:

- PPW – Edition 12 (Ref 5.18).
- Future Wales: The National Plan to 2040 (Ref 5.20).
- TAN 24: The historic environment (Ref 5.40).

## Local Policy

5.2.6 The following local policy was relevant to Historic Environment:

- Anglesey and Gwynedd Joint Local Development Plan 2011 – 2026 (Ref 5.21).
- Eryri Local Development Plan 2016 – 2031 (Ref 5.23).

## Guidance

5.2.7 The following guidance was relevant to Historic Environment:

- Conservation Principles for the Sustainable Management of the Historic Environment in Wales (Ref 5.41).
- Heritage Impact Assessment in Wales (Ref 5.42).
- Managing Change to Listed Buildings in Wales (Ref 5.43).
- Managing Change to Registered Historic Parks and Gardens in Wales (Ref 5.44).
- Managing Conservation Areas in Wales (Ref 5.45).
- Managing Historic Character in Wales (Ref 5.46).
- Managing Lists of Historic Assets of Special Local Interest (Ref 5.47).
- Setting of Historic Assets in Wales (Ref 5.48).
- Chartered Institute for Archaeologists Standard and Guidance for Historic Environment Desk-based Assessment (Ref 5.49).

## Assumptions and Limitations

5.2.8 A Zone of Theoretical Visibility (ZTV) was not prepared as part of Landscape and Visual Amenity Assessment as likely significant impacts were scoped out.

## Future Baseline

5.2.9 This section considers any changes to the baseline conditions that might occur over the lifespan of the Wider Works, but in the absence of the Wider Works (i.e. in the event that the Wider Works are not undertaken).

## Existing Baseline (2024)

5.2.10 Based on available information, there are no reasons to expect that there would be any marked change in the historic environment baseline in the absence of the Wider Works. Land-uses within the Wider Works site would remain as they are currently, which would retain the existing settings of built historic assets and impacts to below ground archaeological remains would be minimal and limited to taphonomic processes (i.e. erosion, degradation, corrosion etc.).



Future Baseline

5.2.11 This assessment of future baseline conditions recognises that below ground archaeological remains reach an equilibrium with their environment and tend to not experience noticeable change, unless their environment changes as a result of human or natural intervention. Similarly, it is recognised that for above ground historic assets, there may be some decay over time in the absence of the Wider Works as they near the natural end of their design lifespan. In addition, it is not considered likely that significant numbers of historic assets will be added to the baseline during the future baseline scenario. The future baseline is unlikely therefore to undergo significant change although it is acknowledged that in the absence of the Project, reconductoring works and fibre wrap replacement of fibre optic cable would take place as part of maintenance of the existing overhead line and would result in the effects identified in this assessment.

Consultation

5.2.12 **Table 5-3** sets out consultation undertaken with relevant stakeholders on Historic Environment.

Table 5-3 – Consultation in response to Historic Environment

Consultee	Date and nature of consultation	Summary of response	How and where addressed
Senior Archaeologist Heneb	11 September 2024. Email correspondence.	AECOM sent an email to Heneb requesting feedback regarding the Study Areas to be used in the DBA and ES, and if a Written Scheme of Investigation (WSI) was required in advance of Historic Environment Record (HER) data request.	The DBA ( <b>Volume 8, Appendix 6.5.I: Historic Environment Desk-based Assessment</b> of the ES) has been carried out in accordance with a WSI agreed with Heneb. The DBA’s Study Area has been agreed with Heneb.
HER Officer Heneb	11 September 2024. Email correspondence.	A data request for HER data within the Project work site and within 500 m of the Wider Works site was requested.	HER data received from Heneb was used in the DBA assessment ( <b>Volume 8, Appendix 6.5.I: Historic Environment Desk-based Assessment</b> ) and to support the ES.

Methodology

5.2.13 Details of the technical methods used to determine the baseline conditions, sensitivity of the receptors, magnitude of effects and the significance criteria that have been used for the Historic Environment assessment can be found in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

## Potential Effects

5.2.14 The anticipated effects resulting from the loss or change to Historic Environment elements and features during the Wider Works are outlined as follows.

5.2.15 The sources of potential Historic Environment effects during the works include:

- Temporary short-term impacts to historic assets as a result of change to their setting.
- Permanent physical impacts to below ground archaeological remains.

### Designated Historic Assets – Within the Wider Works site

#### Hut Group Near Tan-y-Coed Pont Rhythallt (CN232)

5.2.16 A hut-circle settlement probably dating to the Iron Age or Romano-British period. There are at least seven circular stone-walled huts, measuring from 3 m to 9 m in diameter, some linked by low stony banks, set in a compact group around a central 'courtyard' area. To the west are three circular stony platforms, possibly the remains of other huts.

5.2.17 The monument is of national importance for its potential to enhance our knowledge of Iron Age or Romano-British settlement. It retains significant archaeological potential, with a strong probability of the presence of associated archaeological features and deposits. The structures themselves may be expected to contain archaeological information concerning chronology and building techniques.

5.2.18 The asset holds archaeological interest, with its value derived from its ability to inform on Iron Age or Romano-British settlement activity. The asset is of high value.

5.2.19 The access route to Tower 4ZC141 runs along existing trackway that is outside the northern edge of the Scheduled Monument. No upgrade to the existing track is expected, with access anticipated to be achieved using ATV if the existing track is unsuitable for standard vehicular access. No change is expected on this asset.

#### Caer Engan (CN148)

5.2.20 The monument comprises the remains of an Iron Age hillfort measuring some 120 m by 64 m, occupying a rocky knoll and defended by a double rampart best preserved on the west and east sides. The ramparts make use of natural outcrops and shelves, and these are supplemented by artificial banks of earth.

5.2.21 The monument is of national importance for its potential to enhance our knowledge of later prehistoric defensive organisation and settlement. The site forms an important element within the wider later prehistoric context and within the surrounding landscape. The site is well preserved and retains considerable archaeological potential. There is a strong probability of the presence of evidence relating to chronology, building techniques and functional detail.

5.2.22 The asset holds archaeological interest, with its value derived from its ability to inform on Iron Age settlement activity. The asset is of high value.

5.2.23 The access route to Tower 4ZC098 is anticipated to run along existing trackway, as well as pasture (which is rough and uneven in places). No upgrade to the existing track is expected, with access anticipated to be achieved using ATV if the existing track is unsuitable for standard vehicular access. There is no requirement for the removal of sections of dry-stone walls to achieve access. Although a portion of the indicative working area for Tower 4ZC098 is in the area of the Scheduled Monument, the works

proposed (i.e. personnel accessing the existing tower) do not involve any ground disturbing activities and so these are not expected to impact on any buried archaeological remains that might exist in the area. The land within the working area is also likely to have been previously disturbed when the OHL was initially installed. No change is expected on this asset.

#### Caerau Ancient Village (CN067)

- 5.2.24 The monument comprises the remains of an enclosed Iron Age settlement of multiple hut circles and early fields on the lower slopes of Mynydd Craig Goch. The scheduled area includes two of the settlement sites and a part of the associated fields. The settlement may have been enclosed but it was probably not a defensive site, whilst long views especially to the west are important, the significant views would have been medium and short over the fields that would have been farmed from the settlement. These views are also primarily to the west.
- 5.2.25 The monument is of national importance for its potential to enhance our knowledge of prehistoric settlement practices. It is an important relic of the prehistoric landscape and retains significant archaeological potential. There is a strong probability of the presence of environmental and structural evidence, including preserved internal and external floor levels.
- 5.2.26 The asset holds archaeological interest, with its value derived from its ability to inform on Iron Age settlement activity. The asset is of high value.
- 5.2.27 The access route to Tower 4ZC086 runs across rough pasture within the area of the Scheduled Monument. Access is anticipated to be achieved using ATV if the pasture conditions are unsuitable for standard vehicular access. No materials will be laid down within the Scheduled Monument area. No change is expected on this asset.

#### **Non-designated Historic Assets – Within the Wider Works site**

##### Part of Roman Road, Segontium - Bryn-y-gefeillau (PRN 17824)

- 5.2.28 Part of a Roman Road which linked Segontium with Bryn-y-gefeillau is projected to run across the access route to Tower 4ZC125 and a short distance north-west (approximately 7 m) of the working area for the same tower in a north-west to south-east orientation. The asset holds archaeological interest as it may help to inform on Roman settlement and communication routes within Gwynedd. The asset is of medium value.
- 5.2.29 The access route to Tower 4ZC125 runs across rough pasture where it meets the projected line of the Roman Road. A new temporary stone road or trackway panels laid directly onto the ground may be required. Access is anticipated to be achieved using ATV if the pasture conditions are unsuitable for standard vehicular access. No change is expected on this asset.

##### Hut Group, South-West of Penyffridd, Rhosgadfan (PRN 741)

- 5.2.30 Enclosed hut group west of Pen y Ffridd at 230 m AOD on ground falling gently to the west. The enclosure is roughly rectangular, 29 m long north-south and 17 m wide. The enclosing wall is only preserved on the east and south, and even on the east it is broken though by a modern track and overlain by an old field wall. The condition of the archaeological site is ruined and partly destroyed. The asset holds archaeological interest as it may help to inform on Romano-British settlement within Gwynedd. The asset is of medium value.

- 5.2.31 The access route to Tower 4ZC113 crosses the area of the enclosed hut group. Access is anticipated to be achieved using ATV if the pasture conditions are unsuitable for standard vehicular access. No change is expected on this asset.

Hut Group, South-West of Pen y Ffridd, Rhosgadfan (PRN 742)

- 5.2.32 An unenclosed hut group south-west of Pen y Ffridd comprise three round huts close together in line on top of a slight ridge. The western hut, now crossed by a modern field wall is 6 m in diameter, a few inner facing stones remain in the wall, and there is a probable entrance 6 m wide on the south-west. The middle hut is 7.6 m in diameter and the eastern hut is 20 m. Possibly Romano-British in date, but occupation of the site may extend into other periods. The asset holds archaeological interest as it may help to inform on Romano-British settlement within Gwynedd. The asset is of medium value.

- 5.2.33 The access route to Tower 4ZC112 crosses the area of the unenclosed hut group. Access is anticipated to be achieved using ATV if the pasture conditions are unsuitable for standard vehicular access. No change is expected on this asset.

Part of a Roman Road, Segontium to Pen Llystyn to Tomen y Mur (PRN 36434)

- 5.2.34 Part of a Roman Road is projected to run across an access route to Tower 4ZC095 and the working area of Tower 4ZC092 in a north-south orientation, as well as bordering a laydown area in proximity to Tower 4ZC092. It runs parallel to another project Roman Road (PRN 17822) which also runs through the same working area in a similar orientation. The asset holds archaeological interest as it may help to inform on Roman settlement and communication routes within Gwynedd. The asset is of medium value.

- 5.2.35 Access is anticipated to be achieved using ATV if the ground conditions are unsuitable for standard vehicular access. No change is expected on this asset.

Part of Roman Road, Segontium to Pen Llystyn to Tomen y Mur (PRN 17822)

- 5.2.36 Part of a Roman Road which linked Segontium to Pen Llystyn to Tomen y Mur is projected to run across an access route to Tower 4ZC095 and the working area of Tower 4ZC092 in a north-south orientation. It runs parallel to another project Roman Road (PRN 36434) which also runs through the same working area in a similar orientation. The asset holds archaeological interest as it may help to inform on Roman settlement and communication routes within Gwynedd. The asset is of medium value.

- 5.2.37 Access is anticipated to be achieved using ATV if the ground conditions are unsuitable for standard vehicular access. No change is expected on this asset.

Stone Gateposts, East of Bodychain Isaf (PRN 33995)

- 5.2.38 The three large stones that form gateposts for two adjacent gates. Oral evidence suggests that the stones were erected in 1847. Their size and state of weathering, apart from the west facing face of the southernmost stone, suggest that they were shaped in antiquity and may have been relocated following improvements to the road. The asset holds archaeological interest as it may help to inform on prehistoric activity within Gwynedd. The asset is of low value.

- 5.2.39 The access route to Tower 4ZC087 utilises these two adjacent gates, and a laydown (approximately 13 m x 8 m in extent). This may involve ground disturbance such as stripping of topsoil for new temporary access tracks. This would impact on any buried archaeological remains that might exist in the area. However, given the limited width of the Wider Works in this area of the Wider Works, it is unlikely that total loss of these

assets will occur. Therefore, the magnitude of impact is low, which on assets of low value, would result in a negligible significance of effect, which is not significant.

#### Field System, Caerau (PRN 3319)

- 5.2.40 This prehistoric field system lies on both sides of the old road that runs north to Nazareth. The hill slope here is crossed by three strip lynchets with perhaps a fourth running in a more or less continuous series. The fields are well preserved. The asset holds archaeological interest, with its value derived from its ability to inform on Iron Age settlement activity. This field system is associated with the Caerau Ancient Village (CN067), a scheduled monument approximately 260 m to the north. The asset holds archaeological interest as it may help to inform on prehistoric settlement in Gwynedd. The asset is of high value.
- 5.2.41 The access route to Tower 4ZC084 runs across rough pasture within the area of the prehistoric field system. Access is anticipated to be achieved using ATV if the existing pasture conditions are unsuitable for standard vehicular access. No change is expected on this asset.

#### Roman Fort (Possible), North of Derwin Bach (PRN 789)

- 5.2.42 The possible remains of a Roman temporary camp is on Derwin Bach Farm. The best-preserved length of the earthwork lies towards the north-west end of a field in an unploughed part now covered by reeds. The rampart (3 m wide and up to 0.3 m high) and ditch (2.5 m wide) can be traced for a straight length of 35 m at the north-west side, at the north-west angle, and for approximately 72 m of the south-west side. The asset holds archaeological interest as it may help to inform on Roman military activity and settlement in Gwynedd. The asset is of medium value.
- 5.2.43 The access route to Tower 4ZC075 runs across rough pasture within the area of the possible Roman Fort. Access is anticipated to be achieved using ATV if the existing conditions are unsuitable for standard vehicular access. No change is expected on this asset.

#### POW Camp Site of, Bryncir (PRN 7878)

- 5.2.44 The location of a WWI prisoner of war camp is recorded on site. It was a work camp affiliated to Frongoch, another prisoner of war camp in Gwynedd, and opened by June 1919. It held 36 prisoners carrying out agricultural work. It possibly closed in October 1919. No other details are available on the layout and form of the camp. The asset holds archaeological interest as it may help to inform on military activity in Gwynedd following World War I. The asset would likely hold local interest and is of low value.
- 5.2.45 The access route to Tower 4ZC070 runs across rough pasture within the area of the POW camp site. Trackway panels may need to be laid directly onto the ground to form a new track. This may involve ground disturbance such as stripping of topsoil for the new temporary access tracks. This would impact on any buried archaeological remains that might exist in the area. However, given the limited width of the Wider Works in this area of the Wider Works, it is unlikely that total loss of these assets will occur. The magnitude of impact is low, which on assets of low value, would result in a negligible significance of effect, which is not significant.

#### Route of old road, Garn Dolbenmaen (PRN 62168)

- 5.2.46 The tithe map of Dolbenmaen Parish (1844) (see **Figure 3.6J.3 in Volume 8, Appendix 6.5.I**) shows an old meandering road from Garn Dolbenmaen via Glan



Dwyfach to Dafarn Faig passing on the north side of Bryn-'refail-ganol farm. The value of the asset is derived from its archaeological interest as part of the post-medieval settlement pattern in the area during 19th century and even earlier. The asset would likely hold local interest and is of low value.

- 5.2.47 The route of the old road runs across the working area for Tower 4ZC067. The movement of vehicles would potentially impact on any buried archaeological remains that might exist in the area.
- 5.2.48 The access route to Tower 4ZC066 also crosses the route of the old road. Trackway panels laid directly onto the ground may be required. This may involve ground disturbance such as stripping of topsoil for the new temporary access tracks.
- 5.2.49 One of the indicative laydown areas (approximately 17 m by 10 m), is also on the line of the old road. This may impact on any buried archaeological remains that might exist in the area.
- 5.2.50 However, given the extent of the Wider Works in this area, it is unlikely that total loss of these assets will occur. The magnitude of impact is low, which on assets of low value, would result in a negligible significance of effect, which is not significant.

#### Tank, East of Gwern-ddwryd (PRN 25574)

- 5.2.51 A tank is marked on the Ordnance Survey second edition map of 1900-01. The value of the asset is derived from its archaeological interest as part of the post-medieval settlement during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. The asset would likely hold local interest and is of low value.
- 5.2.52 The access route to Tower 4ZC047 runs across rough pasture within the area of the tank. Trackway panels laid directly onto the ground may be required. This may involve ground disturbance such as stripping of topsoil for new temporary access tracks. This would impact on any buried archaeological remains that might exist in the area. However, given the limited width of the Wider Works in this area of the Wider Works, it is unlikely that total loss of these assets will occur. The magnitude of impact is low, which on assets of low value, would result in a negligible significance of effect, which is not significant.

#### Building and Paddock, Cefn Faes (PRN 1814)

- 5.2.53 The remains of a rectangular stone building approximately 6 m x 9.5 m comprising large boulder and rubble walls to a max height of 0.5 m with a probable entrance in the middle of the north side. Attached to it on the south side is a large rectangular level platform, 18.7 m long and varying between 10 to 13 m in width. They are the remains of a farm building and paddock for corralling animals, probably medieval in date. The asset holds archaeological interest as it may help to inform on medieval settlement within Gwynedd. The asset is of medium value.
- 5.2.54 The access route to Tower 4ZC012 crosses the area of the building and paddock. As the access route crosses pasture, trackway panels laid directly onto the ground may be required. This may involve ground disturbance such as stripping of topsoil for the new temporary access tracks. This would impact on any buried archaeological remains that might exist in the area. However, given the limited width of the Wider Works in this area of the Wider Works, it is unlikely that total loss of these assets will occur. The magnitude of impact is low, which on assets of medium value, would result in a minor adverse significance of effect, which is not significant.

## Sheepfold, South of Gwylan, Trawsfynydd (PRN 90398)

- 5.2.55 A sheepfold is marked on the Ordnance Survey first edition map of 1889. The value of the asset is derived from its archaeological interest as evidence of post-medieval agricultural activity during 19<sup>th</sup> century and even earlier. The asset would likely hold local interest and is of low value.
- 5.2.56 The site of the sheepfold is in the working area for Tower 4ZC006. The movement of vehicles would potentially impact on any buried archaeological remains that might exist in the area. Given the extent of the Wider Works in this area, it is unlikely that total loss of these assets will occur. The magnitude of impact is low, which on assets of low value, would result in a negligible significance of effect, which is not significant.

## Mitigation and Residual Effects

- 5.2.57 Potential impacts to below ground archaeological remains that cannot be avoided by design can be mitigated through a proportionate programme of archaeological investigation, recording and reporting, such as archaeological monitoring and/or excavation in advance of the works, which would form additional mitigation measures. This would not result in a reduction in the physical impacts to archaeological remains but would mitigate the impact by providing a greater understanding and appreciation of the evidential value of archaeological remains.
- 5.2.58 No significant effect has been identified on the setting of the World Heritage Site, Scheduled Monuments, Listed Buildings or historic landscapes, during the Wider Works.
- 5.2.59 The scope of mitigation will be set out in a WSI and agreed with the Archaeological Advisor for Heneb, prior to works commencing.

## Summary

- 5.2.60 The assessment examined previously recorded assets within a 500 m Study Area of the Wider Works, with data collected from Heneb (non-designated historic assets) and within a wider 3 km Study Area with data collected both from Heneb and Cadw (designated historic assets). This data was supplemented by a review of historic mapping, documentary sources, and a walkover survey.
- 5.2.61 All identified impacts are limited to physical impacts during the Wider Works. No significant effect has been identified on potential below ground archaeological remains along the Wider Works.
- 5.2.62 A full programme of mitigation will be agreed with Heneb Gwynedd Archaeology prior to works commencing and will be covered by a WSI.

### 5.3 Air Quality and Emissions

5.3.1 This section presents an assessment of the likely Air Quality and Emissions effects that could arise from the Wider Works as described in **Chapter 2: Wider Works**.

5.3.2 This section is supported by figures and appendices as listed below:

- **Figure 6.5.5: Construction Dust Assessment.**
- **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance.**
- **Volume 8, Appendix 1.4.A: Topic Assessment Methodology.**

#### Legislation and Planning Policy

5.3.3 This section summarises the legislation and planning policy framework that is relevant to the Air Quality and Emissions assessment. Details are in **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance**.

#### Legislation

5.3.4 The following legislation is relevant to Air Quality and Emissions:

- The Environment Act 1995 (Ref 5.50).
- The Environment (Wales) Act 2016 (Ref 5.6).
- The Environment Act 2021 (Ref 5.5).
- Environment (Air Quality and Soundscapes) (Wales) Act 2024 (Ref 5.51).
- The Air Quality (Wales) Regulations 2000 (Ref 5.52).
- The 2007 Air Quality (England) Strategy England, Scotland, Wales and Northern Ireland (Ref 5.53).
- The Air Quality Standards Regulations 2010 as amended (Ref 5.54).
- The Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018 (Ref 5.55).
- Well-being of Future Generations (Wales) Act 2015 (Ref 5.56).

5.3.5 **Table 5-4** provides the Air Quality Standards (AQS) and Air Quality Objectives (AQO) relevant to this assessment.

Table 5-4 – Relevant AQS and AQO

Pollutant	Averaging period	Value (micrograms per metre cubed (µg/m³))
Nitrogen Dioxide (NO <sub>2</sub> )	Annual mean	40
	1-hour mean (not to be exceeded more than 18 times per year)	200
Particulate Matter (PM) <sub>10</sub>	Annual mean	40
	24-hour mean (not to be exceeded more than 35 times per year)	50



PM <sub>2.5</sub>	Annual mean	20
	Annual mean (by 2040)	10
	Interim target (by end of January 2028)	12

## National Policy

5.3.6 The following national policy is relevant to Air Quality and Emissions:

- PPW – Edition 12 (Ref 5.18).
- The Clean Air Plan for Wales (Ref 5.57).
- Future Wales – The National Plan 2040 (Ref 5.20).

## Local Policy

5.3.7 The following local policy is relevant to Air Quality and Emissions:

- Anglesey and Gwynedd Joint Local Development Plan 2011 – 2026 (Ref 5.22).
- Eryri Local Development Plan 2016 – 2031 (Ref 5.23).

## Guidance

5.3.8 The following guidance is relevant to Air Quality and Emissions:

- IAQM Guidance on the assessment of dust from demolition and construction (Reg 5.33).
- IAQM and Environmental Protection UK (EPUK) Land-Use Planning & Development Control: Planning For Air Quality (Ref 5.58).

## Assumptions and Limitations

5.3.9 The dust assessment methodology is informed by professional judgement, including consideration of estimates of the works activities, vehicle movements and number of plant at Wider Works site, the area of ground to be worked, and the volume of structures erected. Where exact data has not been available, precautionary assumptions have been made to ensure the potential for impact is over-estimated, rather than under-estimated.

## Future Baseline

5.3.10 Future baseline conditions are assumed to be similar to existing baseline conditions although concentrations of NO<sub>2</sub> and NO<sub>x</sub> are expected to fall in future years, due to decarbonisation of the transport and energy sectors. This decrease is likely to be larger in urban areas and smaller in rural areas. Notwithstanding, it is acknowledged that in the absence of the Project, reconductoring works and fibre wrap replacement of fibre optic cable would take place as part of maintenance of the existing overhead line and would result in the same or similar effects as identified in this assessment.

## Methodology

5.3.11 Details of the technical methods used to determine the baseline conditions, sensitivity of receptors, magnitude of effects and the significance criteria that have been used for the Air Quality assessment can be found in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

## Potential Effects

- 5.3.12 The anticipated effects resulting from the change to Air Quality during the Wider Works are outlined as follows.
- 5.3.13 The sources of potential Air Quality and Emissions effects during the works include:
- Dust emissions.
  - Site plant emissions.
- 5.3.14 Works traffic emissions are not considered as they have been scoped out of this assessment. The expected number of vehicle movements generated by the Wider Works will not exceed the criteria set by guidance to suggest a significant effect from such emissions could occur.

### Dust Emissions

- 5.3.15 The assessment considers the potential impact for the area surrounding the Wider Works site.
- 5.3.16 As described in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, the dust and particulate matter assessment follows the step-by-step approach set out in relevant IAQM guidance (Ref 5.53). This process is summarised in the sub-sections below.
- Step 1: Screen the requirement for a detailed assessment
- 5.3.17 Step 1 of the IAQM construction dust guidance is to screen the requirement for a more detailed assessment. According to the guidance, no further assessment is required if there are no receptors within a specified distance of the works. The screening distances set by the IAQM guidance (Ref 5.33) are:
- Receptors sensitive to amenity and human health impacts within 250 m of the Wider Works site or within 50 m of a public road used by works traffic that is within 250 m of the site entrance(s).
  - Nature conservation receptors within 50 m of the Wider Works site or within 50 m of a public road used by works traffic that is within 250 m of the site entrance(s).
- 5.3.18 **Figure 6.5.5** shows a 250 m buffer from the edge of the Wider Works site in which human health and amenity receptors may be impacted by work activities. The Wider Works area is predominantly rural, however there are residential properties and other sensitive receptors within 250 m of the Wider Works site.
- 5.3.19 There are two SAC, four SSSI, one NNR and 25 sites of Ancient Woodland within 20 m of the Wider Works site.
- 5.3.20 Due to the presence of the high sensitivity amenity, human health receptors and ecologically sensitive sites within the screening distances set by the guidance, the more detailed assessment of dust is required and set out below.

### Step 2: Assess the Risk of Dust Impacts

#### Step 2A: Determine the Dust Emissions Magnitude

- 5.3.21 Step 2A requires the determination of the dust emission magnitude, as set out in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, which the guidance states is based on the scale of the anticipated works with the following activities:

demolition; earthworks; construction (i.e. the building and erection of structures); and trackout (the deposition of dust and particulate matter onto public roads by works vehicles). The dust emission magnitude should be classified as Small, Medium, or Large.

- 5.3.22 Activities associated with the Wider Works are described in **Chapter 2: Wider Works**. Works include temporary establishment and operation of works compounds, earthworks associated with the reconductoring of overhead lines and the upgrading of access roads.

#### *Demolition*

- 5.3.23 There will be no demolition works and this activity is not considered further in this assessment.

#### *Earthworks*

- 5.3.24 The site is anticipated to require earthworks associated with the removal of topsoil and formation of works compounds and temporary storage. Given that the total area of the Wider Works site is considered to exceed the 110,000 metres squared (m<sup>2</sup>) criteria set by the IAQM guidance (Ref 5.59), the dust emissions magnitude effect for earthworks is Large.

#### *Construction*

- 5.3.25 The Wider Works do not involve building and erection of any permanent structures and the majority of the works will be undertaken using materials with a low potential to generate dust. Also, whilst the area of the Wider Works site is large, the volume of work is limited to small sections within that Wider Works site. As such, and in line with the IAQM construction dust guidance (Ref 5.33), summarised in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, the dust emissions magnitude assigned for construction is Small.

#### *Trackout*

- 5.3.26 Trackout is associated with the deposition of mud and potentially dusty material onto the public network from works vehicles leaving site. On average, there is anticipated to be more than two outward works-related HDV (all vehicles >3.5 tonnes) movements per day. This falls within the lowest dust emissions category defined in the IAQM construction dust guidance (Ref 5.33), summarised in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**. The dust emission magnitude for trackout is therefore assigned as Small.

#### Step 2B: Determine the Sensitivity of the Area

- 5.3.27 Step 2B of the IAQM construction dust guidance, as described in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, requires the determination of the sensitivity of the area to construction dust impacts. According to the guidance, this is based on the sensitivity of individual receptors, the proximity and number of those receptors, background PM<sub>10</sub> concentrations and site-specific factors, such as local terrain, meteorology and natural and existing windbreaks.
- 5.3.28 The IAQM criteria breaks up sensitivity into determining the sensitivity of the area on dust soiling and based on human health sensitivities of PM<sub>10</sub>. **Table 5-5** summarises the distribution of receptors to dust soiling, **Table 5-6** presents the distribution of receptors

which are sensitive to the health effects of PM<sub>10</sub> and **Table 5-7** shows the distribution of ecological sensitive receptors.

Table 5-5 – Receptors sensitive to dust soiling

Receptor sensitivity	Distance from the Wider Works site			
	0 – 20 m	20 – 50 m	50 – 100 m	100 – 250 m
High	97	110	203	709
Medium	2	7	2	15
Low	2	1	2	5

Table 5-6 – Receptors sensitive to human health effects from PM<sub>10</sub>

Receptor sensitivity	Distance from the Wider Works site			
	0 – 20 m	20 – 50 m	50 – 100 m	100 – 250 m
High	95	107	200	693
Medium	2	3	3	16
Low	4	4	3	20

Table 5-7 – Receptors sensitive to ecological impacts

Receptor Sensitivity	Distance from the Wider Works site	
	0 – 20 m	20 – 50 m
High	2	0
Medium	4	1
Low	44	4

- 5.3.29 There are between 10 – 100 high sensitivity amenity and human health receptors within 20 m of the Wider Works site. In line with the IAQM construction dust guidance (Ref 5.33), summarised in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, this equates to an area of High sensitivity for dust soiling amenity impacts.
- 5.3.30 Background PM<sub>10</sub> concentrations are estimated to be below 24 µg/m<sup>3</sup> in and <100 high sensitivity receptors within 20 m of the Wider Works site. In line with the IAQM construction dust guidance (Ref 5.33), summarised in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, this equates to an area of Low sensitivity for human health impacts.
- 5.3.31 There are two high sensitivity nature conservation receptors within 20 m of the Wider Works site: the Afon Gwyrfaï a Llyn Cwellyn SAC and the Coedydd Derw a Safleoedd Ystlumod Meirion SAC. In line with the IAQM construction dust guidance, this equates to an area of High sensitivity for nature conservation impacts.

## Step 2C: Determine the Risk of Dust Impacts

- 5.3.32 Step 2C of the IAQM guidance concerns the determination of the risk of dust impacts, which is informed by the dust emission magnitude identified in Step 2A and the sensitivity of the area identified in Step 2B.
- 5.3.33 In this instance, the Large dust emissions magnitude associated with earthworks, and the High sensitivity of the area to dust soiling and ecology impacts, equates to a High risk of amenity impacts and ecology impacts occurring. Due to the good standard of existing air quality, the Large dust emissions magnitude associated with earthworks, and the Low sensitivity of the area to human health impacts, equates to a Low risk of human health impacts occurring.
- 5.3.34 The Small dust emissions magnitude assigned to both 'construction' and trackout, and the High sensitivity of the area to dust soiling, human health and ecology impacts, equates to a Low risk of amenity, human health and ecology impacts occurring, during these activities.

### *Works Site Plant and Non-Road Mobile Machinery (NRMM) Emissions*

- 5.3.35 According to the IAQM guidance (Ref 5.33) exhaust emissions from on-site plant (and NRMM) and site traffic are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. This is the case for the Wider Works, due to the transient and intermittent nature of emissions from site plant and NRMM, operating when and where required.
- 5.3.36 A review of site plant and NRMM machines has deemed that the effect of impacts will not be significant on the receptors considered in this assessment, in line with the IAQM guidance, for the following reasons:
- The very good standard of baseline air quality.
  - The transient and intermittent nature of emissions.
  - The limited duration of time in which site plant and NRMM emissions will be present at any one location close to sensitive receptors.
  - The distance between emissions sources and the nearest high sensitivity receptors at the majority of locations.
  - The effectiveness of standard practice emission control measures, including:
    - Use of plant with low NO<sub>x</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> emissions.
    - Prohibiting unnecessary idling.
    - Prohibiting unnecessary NRMM movements.
    - Keeping plant and NRMM in a good state of repair.

## Mitigation and Residual Effects

- 5.3.37 As discussed in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**, the dust assessment follows a step-by-step approach to determine the level of mitigation required to ensure that a significant effect will not occur. Step 3 of the IAQM guidance relates to the level of mitigation required following consideration of the risk of impacts identified during Step 1 and Step 2, which are described in above.

5.3.38

The following mitigation measures are highly recommended by the IAQM and will be adopted during the works:

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Display the name and contact details of person(s) accountable for air quality and dust issues on the works compound fence. This may be the environment manager or environmental engineer or the site manager.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authorities when asked.
- Record any exceptional incidents that cause dust or air emissions, either on- or off-site, and the action taken to resolve the situation in the logbook.
- Undertake daily on-site and off-site inspection (including roads), where receptors are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked.
- Carry out regular site inspections to monitor compliance with the WEMP commitments, record inspection results, and make an inspection log available to the Local Authorities when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Sustainable power sources (solar panels etc.) to be used where practicable. Where available, generators are to be low emission with hybrid battery systems (or to current best practice).
- Use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust and particulate matter suppression mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors (if used) and covered skips.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Avoid site runoff of water or mud.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

5.3.39

Step 4 of the IAQM construction dust guidance is to determine whether the effects, after the application of the identified level of mitigation are significant or not. The IAQM guidance states that:



*“For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be ‘not significant’”.*

- 5.3.40 The implementation of the identified dust mitigation above will result in the residual effects from the Wider Works being negligible and not significant.

## Summary

- 5.3.41 Existing air quality in the Study Area is of a very good standard, with pollutant concentrations well within the objective values set for the protection of human health. Much of the land within and around the site works is rural in nature. Due to the length of the Wider Works site, there are amenity, air quality and ecology sensitive receptors close enough to the Wider Works site that could be adversely impacted by the works.
- 5.3.42 The assessment has followed the IAQM guidance on assessing works site air quality impacts. It has determined that, providing all work activities adhere to the mitigation measures listed in this section, the potential magnitude of impacts will be negligible and not significant.
- 5.3.43 The impact of NRMM emissions is anticipated to be not significant. This is due to the good standard of baseline air quality, the transient and intermittent nature of emissions from this source, the limited duration of time in which such machinery will be operation, and the effectiveness of standard practice emissions control measures.
- 5.3.44 Works road traffic emissions and operational road traffic emissions impacts were screened out of the assessment. The increase in traffic during the works is such that there is no potential for them to contribute to a significant effect on local air quality and no change is expected for operational road traffic. There is no potential for a significant effect on local air quality from a change in emissions.

## 5.4 Climate Change

- 5.4.1 This section presents an assessment of the likely Climate effects that could arise from the work activities described in **Chapter 2: Wider Works**.
- 5.4.2 The assessment is consistent with the ruling by the Supreme Court in the Finch Case (Ref 5.60), in that it addresses all relevant direct and indirect environmental impacts, whether these are upstream or downstream of the Wider Works.
- 5.4.3 This section is supported by the appendices as listed below:
- **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance.**
  - **Volume 8, Appendix 1.4.A: Topic Assessment Methodology.**
  - **Volume 8, Appendix 6.5.K: Climate Change Risk Assessment.**

### Legislation and Planning Policy

- 5.4.4 This section summarises the legislation and planning policy framework that is relevant to the climate assessment. Details are in **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance**.



## Legislation

- 5.4.5 The following legislation is relevant to Climate Change:
- United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement (Ref 5.61).
  - UK Nationally Determined Contribution (Ref 5.62).
  - Climate Change Act 2008 (as amended) (Ref 5.63).
  - The Climate Change (Interim Emissions Targets) (Wales) (Amendment) Regulations 2021 (Ref 5.64).
  - Environment (Wales) Act 2016 (Ref 5.6).
  - Well-being of Future Generations (Wales) Act 2015 (Ref 5.56)
- 5.4.6 To align with the requirements of 2017 TCP EIA Regulations<sup>1</sup> (Ref 3.1), the climate assessment is required to consider the following aspects:
- Greenhouse Gas (GHG) Assessment – considers the impact on the climate of GHG emissions arising from the Wider Works during its lifetime. This considers the Wider Works in the context of the UK and Welsh carbon budgets and how it would affect the ability of the Government to meet its carbon reduction targets.
  - Climate Change Risk Assessment (CCRA) – considers the resilience of the Wider Works to climate change impacts, including how the Wider Works are designed to reduce its vulnerability to the projected impacts of climate change.
  - In-combination Climate Change Impact (ICCI) Assessment – the combined impact of the Wider Works and future climate change on receptors in the surrounding environment.

## National Policy

- 5.4.7 The following national policy is relevant to Climate Change:
- Working Together to Reach Net Zero: All-Wales Plan April 2022 Update (Ref 5.65).
  - PPW – Edition 12 (February 2024) (Ref 5.18).
  - Future Wales – the National Plan 2040 (Ref 5.20).

## Guidance

- 5.4.8 The following guidance is relevant to Climate Change:
- Institute of Environmental Management and Assessment (IEMA)<sup>1</sup> – Environmental Impact Assessment Guide to: Climate Change Resilience and Adaption (Ref 5.66).
  - IEMA – Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition (Ref 5.67).

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<sup>1</sup> The Institute of Environmental Management and Assessment (IEMA) changed its name to the Institute of Sustainability and Environmental Professionals on 17 July 2025. At the time of writing, guidance was still IEMA branded and will be referred to throughout this volume.

## Assumptions and Limitations

### GHG Assessment

- 5.4.9 Granular activity data required for a quantitative GHG assessment was not available to inform the assessment. Consequently, a qualitative approach was adopted to identify GHG emission sources. Further details on the approach taken for the qualitative GHG Assessment are provided in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

### CCRA

- 5.4.10 The start date of the CCRA will be the start of the Wider Works. In line with the programme, the Wider Works are assumed to take place from Q1 2026 to Q2 2029.
- 5.4.11 For the purposes of the CCRA a reference operational period of 40 years was assumed, in accordance with asset lifespans.
- 5.4.12 The CCRA has been carried out using the most up to date, reliable and publicly available climate data. Information has also been taken from internal documents provided by the client and relevant ES chapters.
- 5.4.13 Climate change projections, by their very nature, are associated with a range of assumptions and limitations. There are inherent uncertainties associated with climate projections. Climate projections are not predictions of the future but are rather a projection based on the best available data and science.
- 5.4.14 UK Climate Projections 2018 (UKCP18) data were collected for the periods 2020–2049, 2040–2069, and 2070–2099 to adequately account for both the short-term Wider Works and the long-term operational period of the refurbished overhead line.
- 5.4.15 A ‘high’ emissions scenario, Representative Concentration Pathway (RCP) 8.5<sup>2</sup>, has been used in the assessment. This reflects a high level of GHG emissions, which has been applied at the 10%, 50%, and 90% probability levels to assess the impact of climate change during the Wider Works and operation of the refurbished overhead line.

## Future Baseline

### GHG Assessment

- 5.4.16 The future baseline for assessing the impact of the Wider Works on climate change is based on a ‘business as usual’ scenario, where the Wider Works are not undertaken. In this scenario, the future baseline assumes the continued operation and maintenance of the existing transmission and distribution infrastructure.

### CCRA and ICCI assessment

- 5.4.17 The future baseline for the CCRA and ICCI assessments is based on UKCP18 data from the Met Office (Ref 5.68) for the 25 km grid square in which the Wider Works site is located.
- 5.4.18 This projection data provides probabilistic indications of how global climate change is likely to affect areas of the UK using pre-defined climate variables and time periods.

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<sup>2</sup> RCP 8.5 is a high global emissions scenario developed by the Intergovernmental Panel on Climate Change (IPCC), commonly used to assess potential climate impacts in a future with no mitigation of GHG emissions.

Projected climate data is presented in **Table 5-8**. Climate parameters considered in the CCRA include the following:

- Mean annual temperature.
- Mean summer temperature.
- Mean winter temperature.
- Number of frost days per annum.
- Maximum summer temperature.
- Minimum winter temperature.
- Mean annual precipitation.
- Mean summer precipitation.
- Mean winter precipitation.
- Extreme weather events (e.g. storms).

5.4.19 The historic and future baseline for the site location is presented in **Table 5-8** below.

5.4.20 For the GHG and the CCRA and ICCI assessments, it is acknowledged that in the absence of the Project, reconductoring works and fibre wrap replacement of fibre optic cable would take place as part of maintenance of the existing overhead line and would result in the same or similar effects as identified in this assessment.

Table 5-8 – Climate change baseline and projection

Climatic variable	Baseline data	Projection (change)				Projected trend	Source
	1981-2010	2020 - 2049	2040 - 2069	2070-2099	Beyond 2100		
Temperature							
Mean annual maximum daily temperature (°C)	12.4	+0.9 (+0.4 to +1.5)	+1.6 (+0.8 to +2.5)	+3.4 (+1.8 to +4.9)	No projection data is available beyond 2100, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Mean summer maximum daily temperature (°C)	17.9	+0.9 (+0.1 to +1.8)	+1.8 (+0.5 to +3.2)	+3.9 (+1.6 to +6.5)		↑	UKCP18
Mean winter minimum daily temperature (°C)	2.2	+0.8 (+0.1 to +1.6)	+1.5 (+0.4 to +2.6)	+2.7 (+1.0 to +4.6)		↑	UKCP18
Number of days of air frost per annum	No data recorded.	Reports have shown that the number of frost air and ground frost days has decreased since the 1960s. Combined with detailed studies, these long-term trends point to a long-term warming trend of the UK's climate and a reduction in cold events.				↓	Met Office
Highest temperature for baseline period (°C)	18.7 (August)	+1.1 (+0.1 to +2.2)	+1.9 (+0.2 to +3.8)	+4.4 (+1.3 to +7.5)	No projection data is available beyond 2100, trend towards increasing temperatures is expected to continue.	↑	UKCP18
Lowest temperature for baseline period (°C)	1.8 (February)	+0.8 (-0.1 to +1.8)	+1.5 (+0.2 to +2.7)	+2.7 (+0.7 to +4.8)		↑	UKCP18

Climatic variable	Baseline data	Projection (change)				Projected trend	Source
	1981-2010	2020 - 2049	2040 - 2069	2070-2099	Beyond 2100		
Precipitation <sup>3</sup>							
Mean annual rainfall (mm)	1944.5	+0.7% (-4.5% to +6.4%)	+1.5% (-5.1% to +8.5%)	+3.2% (-7.0% to +13.8%)	No projection data is available beyond 2100. However, there is potential for a continued slight increase in rainfall overall.	↑	UKCP18
Mean summer rainfall (mm)	143.3	-6.8% (-22.1% to +8.6%)	-15.5% (-35.5% to +4.3%)	-30.8% (-53.9% to -4.6%)	No projection data is available beyond 2100, but the decreasing trend in summer rainfall could potentially continue beyond this period.	↓	UKCP18
Mean winter rainfall (mm)	176.4	+2.4% (-7.3% to +13.5%)	+9.1% (-3.4% to +24.1%)	+18.7% (-2.1% to +43.2%)	No projection data is available beyond 2100, but it is possible that the trend of increasing winter rainfall could persist beyond this period.	↑	UKCP18
Wettest month on average (mm)	220 (October)	+7.8% (-12.6% to +30.4%)	+13.8% (-9.1% to +39.4%)	+17.7% (-14.6% to +58.3%)	No projection data is available beyond 2100. An increase in rainfall during the month of October is possible.	↑	UKCP18

<sup>3</sup> Changes in precipitation across climate projection periods are measured and reported as percentage change (%).

Climatic variable	Baseline data	Projection (change)				Projected trend	Source
	1981-2010	2020 - 2049	2040 - 2069	2070-2099	Beyond 2100		
Driest month on average (mm)	104.7 (May)	+2.8% (-18.0% to +22.6%)	-1.1% (-26.7% to +23.5%)	-9.1% (-41.1% to +24.4%)	No projection data is available beyond 2100. A decrease in rainfall during the month of May is possible.	↓	UKCP18
Other							
Droughts	The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one. However, it is the distribution of rainfall throughout the seasons that will determine UK drought risk (Ref 5.69).					↑	Met Office
Storms	The Met Office projects that climate change will likely lead to more frequent and intense winter storms in the UK, driven by factors such as rising sea surface temperatures and changes in the jet stream. While past data shows no clear trend in storm frequency or intensity, future projections indicate an increase in severe storms, particularly during winter, with stronger winds and heavier rainfall, which could also worsen coastal flooding due to rising sea levels (Ref 5.70).					↑	Met Office
Wildfires	The wildfire hazard is classified as high according to the information that is currently available to the Think Hazard tool (Ref 5.71). This means that there is greater than 50% chance of experiencing weather that could support a hazardous wildfire that may pose some risk of life and property loss in any given year.					↑	Think Hazard

5.4.21 Some of the key trends that were identified from collected quantitative data were an increase in temperature variables, a decline in summer rainfall and an increase in winter rainfall, for all future time periods.

5.4.22 Qualitative climate projection data was also gathered, which is summarised below:

- Heatwaves: Under a high emissions scenario, it is estimated that by the end of the 21st century, all areas of the UK are projected to be warmer with hotter and drier summers likely to become more common (Ref 5.72). According to the World Bank's Think Hazard Tool, the heatwave hazard for the area including the Wider Works site is classified as 'Low' (Ref 5.71).
- Snow fall: The Met Office projects under a moderate and high emissions scenario that regional and local projections show a decrease in falling and lying snow across the UK for the period 2061-2080 relative to the 1981-2000 baseline (Ref 5.71).
- Drought: The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one. However, it is the distribution of rainfall throughout the seasons that will determine UK drought risk (Ref 5.69).
- Frost days per annum: Reports have shown that the number of frost air and ground frost days has decreased since the 1960s. Combined with detailed studies, these long-term trends point to a long-term warming trend of the UK's climate and a reduction in cold events (Ref 5.74).
- Sea level rise: The Met Office predicts sea levels may rise by 98 cm by the end of the 21<sup>st</sup> century under a high emissions scenario (Ref 5.70). According to the World Bank's Think Hazard Tool, the coastal flood hazard for the area including the Wider Works site is classified as 'High' (Ref 5.71).
- Storms: The Met Office projects that climate change will likely lead to more frequent and intense winter storms in the UK, driven by factors such as rising sea surface temperatures and changes in the jet stream. While past data shows no clear trend in storm frequency or intensity, future projections indicate an increase in severe storms, particularly during winter, with stronger winds and heavier rainfall, which could also worsen coastal flooding due to rising sea levels (Ref 5.74).
- Wildfires: Climate projections indicate that wildfire risk may increase in future decades. UKCP18 indicates a large future increase in hazardous fire weather conditions in summer. At 2°C global warming, the probability of days with "very high" fire danger is predicted to double compared to the historical period of 1981-2010. This probability increases by a factor of 5 at 4°C of warming (Ref 5.74). According to the World Bank's Think Hazard Tool, the wildfire hazard for the area including the Wider Works site is classified as 'Medium' (Ref 5.71).
- Landslides: According to the World Bank's Think Hazard Tool, the landslide hazard for the area including the Wider Works site is classified as 'Medium' (Ref 5.71).

## Methodology

5.4.23 The purpose of the climate assessment is to assess the potential effects of the Wider Works on the climate and of climate change on the Wider Works.

5.4.24 The methodology is provided for both the CCRA and GHG Assessments. It includes details of the technical methodology used to determine baseline conditions, receptor sensitivity, magnitude of effects, and significance criteria for the climate assessments.



These details can be found in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

## Potential Effects

- 5.4.25 A separate GHG assessment for the Wider Works was not undertaken, as no materially different emissions sources or working methods were identified that would justify a standalone assessment.
- 5.4.26 However, a separate CCRA was undertaken for the Wider Works to reflect its specific location, design, and exposure to climate-related hazards. The associated risk assessment is presented in **Volume 8, Appendix 6.5.K: Climate Change Risk Assessment**.

## GHG Assessment

- 5.4.27 The GHG emissions are reported in line with the lifecycle stages of the civil engineering works assessment, as outlined in the Publicly Available Specification 2080:2023 Guidance (Ref 5.75). Additionally, the Royal Institution of Chartered Surveyors Guidance for whole life GHG assessments (Ref 5.76) have been integrated to inform the scope and reporting framework of the GHG assessment.
- 5.4.28 **Table 5-9** qualitatively summarises the GHG emissions associated with the Wider Works and operation of the refurbished overhead line.

**Table 5-9 – Qualitative lifecycle GHG assessment of the Wider Works**

Lifecycle stage	Qualitative assessment	Estimated GHG % contribution to the Wider Works
Pre-works stage (A0)	The pre-works stage is expected to contribute very minimally to the overall GHG emissions of the Wider Works.	<1%
Product stage (A1 – A3)	Based on previous lifecycle GHG assessments, embodied GHG emissions from the product stage are expected to represent the largest source of emissions over the lifecycle of the Wider Works. This stage includes the extraction, transportation, and manufacturing of raw materials. However, due to the scale of the Wider Works, emissions from the product stage are not anticipated to be substantial in the context of Wales and UK carbon budgets.  Furthermore, GHG emissions associated with the product stage are expected to be controlled and reduced through various mechanisms, including NGET's internal climate policies and relevant national policies, as discussed below.	~70%
Works process stage (A4 – A5)	Based on similar-scale projects, GHG emissions from carrying out the Wider Works are expected to be the second largest contributor of GHG emissions.	~20%

Lifecycle stage	Qualitative assessment	Estimated GHG % contribution to the Wider Works
	A WEMP will be prepared before start of the Wider Works, including measures like sourcing local materials to reduce GHG emissions.	
Operation stage (B1 – B7)	<p>The operational stage of the Wider Works is expected to be the third largest contributor to GHG emissions, primarily due to maintenance activities, equipment replacement, transmission losses, and worker transport. However, energy consumption during operation is anticipated to be minimal, as the works are designed to transmit rather than consume electricity. Operational energy use will be limited to control systems and auxiliary services, which are energy-efficient and require only a small amount of power. As such, associated emissions are expected to be negligible, particularly in the context of the ongoing decarbonisation of the electricity grid. Operational emissions are therefore unlikely to materially affect the overall GHG profile of the Wider Works.</p> <p>While these emissions are unlikely to substantially impact the UK's or Wales' net-zero targets, the Wider Works are expected to deliver wider indirect benefits by enabling the expansion of onshore and offshore renewables. This will support continued decarbonisation of the UK power grid through increased generation of low-carbon electricity.</p> <p>Operational efficiency will be maintained through regular inspections, with component replacement undertaken as needed to prevent deterioration.</p>	~10%
5.4.29	As detailed in <b>Table 5-9</b> , it is estimated that the bulk of emissions (estimated around 95%) from the Wider Works will come from the A0 – A5 lifecycle stages.	
5.4.30	NGET is committed to achieving carbon neutrality across all its construction projects by 2025/26 (Ref 5.77), focusing on reducing the carbon intensity of construction materials and the phasing out of diesel-powered works plant. In addition, NGET has committed to phasing out the sending of waste to land fill by 2028 (Ref 5.77).	
5.4.31	The Transport Decarbonisation Plan (TDP) (Ref 5.78) supports national net-zero targets by committing to reduce transport-related GHG emissions. The TDP outlines measures to support a shift towards low-carbon transportation, such as increasing the use of electric vehicles. GHG emissions from worker and materials transportation are anticipated to decrease in line with government policy in the TDP.	
5.4.32	The UK Government's Net Zero Strategy (Ref 5.79) sets out plans to reduce GHG emissions across all sectors to meet national net-zero targets. This includes initiatives to decarbonise construction material supply chains. As a result, GHG emissions from maintenance activities, including component replacements, are expected to decrease.	

- 5.4.33 The Project will support the UK's transition to net zero by providing the necessary infrastructure to enable the increased transmission of low-carbon electricity. As renewable energy generation increasingly replaces higher-carbon energy sources, this aligns with the UK Government's goal of achieving an electricity system independent of fossil fuels by 2035.
- 5.4.34 IEMA GHG Assessment guidance (Ref 5.67) states that assessing the significance of a project's impact on the climate should not be based solely on the magnitude of emissions emitted, but also on how these emissions align with national policies and the path towards net zero. The assessment must therefore determine whether the Wider Works could negatively affect Wales and the UK's ability to meet legislated carbon budgets and net-zero targets.
- 5.4.35 Based on a qualitative assessment, the magnitude of GHG emissions is not material in the context of the UK and Welsh carbon budgets. The Wider Works are consistent with applicable UK and Welsh Government climate change policy and legislation. In accordance with the IEMA GHG Guidance (see **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**), the effect of GHG emissions associated with the Wider Works is deemed minor adverse (not significant).
- 5.4.36 While not legally binding, NGET has also demonstrated a commitment to reduce GHG emissions through the setting of validated Science-Based Targets (Ref 5.80), aligning NGET with the Paris Commitment (Ref 5.61). These targets are as follows:
- Scope 1<sup>4</sup> and 2<sup>5</sup> GHG emissions: Reduce absolute scope 1 and 2 emissions by 60% by 2030 from a 2018 base year.
    - Scope 1 emissions from power generation: Reduce scope 1 GHG emissions by 90% per Megawatt hour (MWh) by 2030 and 92% per MWh by 2033, both from a 2018 base year.
    - Other Scope 1 and 2 emissions: Reduce all other absolute Scope 1 and 2 GHG emissions by 50% by 2030 from the 2018 base year.
- 5.4.37 Scope 3<sup>6</sup> emissions: Reduce Scope 3 category 3 GHG emissions from all generated and sold electricity by 86% per MWh by 2033 from a 2018 base year and reduce all absolute scope 3 GHG emissions by 37.5% by 2033 from a 2018 base year.

## CCRA

- 5.4.38 This section summarises the climate risks identified for the Wider Works. The majority of climate risks relate to changes in temperature and precipitation, flooding, storm events, drought, and wildfires.
- 5.4.39 The Wider Works will be designed and operated in accordance with the risks and mitigation measures outlined in NGET's Climate Resilience Strategy (Ref 5.81). This approach enables the Wider Works to withstand the climatic conditions projected for the end of its design life. Additionally, a WEMP will be developed to incorporate measures aimed at reducing the impact of climate-related risks during the Wider Works

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<sup>4</sup> Scope 1: Direct emissions from sources that are owned or controlled by the organisation.

<sup>5</sup> Scope 2: Indirect emissions from the generation of purchased electricity, steam, heating, and cooling consumed by the reporting organisation.

<sup>6</sup> Scope 3: All other indirect emissions that occur in the value chain of the reporting company, both upstream and downstream. Scope 3 Category 3 covers the upstream extraction, production, transport, and transmission losses associated with the fuels and energy purchased by the company.

- 5.4.40 In accordance with IEMA CCRA Guidance (Ref 5.66) (see **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**), the climate risks for Wider Works are assessed as moderate, unlikely, or rare. While the climate event is possible, its occurrence is infrequent, with some evidence suggesting a potential shift from business as usual. The likelihood of the event is estimated to be between 0% and 50%. The consequence of climate change impacts was identified as insignificant and minor in terms of their impact on the Wider Works. As a result, the climate risks identified during the Wider Works and operation of the refurbished overhead line are not significant.

## Mitigation and Residual Effects

### GHG Assessment

- 5.4.41 As no significant impacts have been identified in the GHG Assessment, no additional mitigation is required. WEMPs will be produced before the Wider Works commence and will include mitigation measures to reduce GHG emissions. The standard measures typically implemented by NGET to reduce GHG emissions during the Wider Works and operation of the refurbished overhead line are sufficient.

### CCRA

- 5.4.42 No significant climate risks were identified in the CCRA for the Wider Works component of the Project. No specific mitigation measures are required for these components of the Wider Works.

## Summary

- 5.4.43 Overall, the GHG impact of the Wider Works has been evaluated as minor adverse (not significant). The Project will bring long-term benefits to the UK and Wales by upgrading energy-related infrastructure. This is essential for integrating new sources of renewable energy and upgrading NGETs capacity to facilitate the electrification of the broader economy. This, in turn, will support the transition away from fossil fuels and help achieve net-zero emissions across Wales and the UK.
- 5.4.44 The CCRA did not identify any significant climate risks for the Wider Works components of the Project. The climate risks for these components of the Wider Works are considered not significant.

# 6. In-Combination and Cumulative Effects

## 6.1 Introduction

- 6.1.1 This chapter introduces the likely in-combination and cumulative effects that could arise from the Wider Works as described in **Chapter 2: Wider Works** and how it is assessed in this ES.
- 6.1.2 In-combination effects occur where a single receptor is affected by more than one type of effect arising from different aspects of the Wider Works. An example of an in-combination effect would be where a local resident is affected by temporary visual effects of construction works, noise and traffic disruption during the construction of a scheme, with the resulting effect being greater than each individual effect alone.

## 6.2 Legislation and Planning Policy

- 6.2.1 This section summarises the legislation and planning policy framework that is relevant to the In-combination and cumulative effects assessment. Full details are in **Volume 8, Appendix 1.1.A: Legislation, Policy and Guidance**.

### Legislation

- 6.2.2 The following legislation is relevant to In-combination effects:
- 2017 TCP EIA Regulations (Ref 6.1).
  - Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017 (Ref 6.2)

### National Policy

- 6.2.3 The national policy is relevant to In-combination and cumulative effects:
- PPW – Edition 12 (Ref 6.3).
  - Future Wales: The National Plan 2040 (Ref 6.4).

## 6.3 Methodology

- 6.3.1 There is no established EIA methodology for assessing and quantifying the effects of a number of individual impacts on the same sensitive receptors. The methodology used to undertake the in-combination effects assessment is based on previous experience and professional judgement. A full description of the methodology used for in-combination effects is outlined in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.
- 6.3.2 A range of public sector and industry-led guidance is available on the approach to assessing in-combination effects but at present there is no single, agreed industry standard method. Whilst the Wider Works or the wider Project as a whole are not classed as a Nationally Significant Infrastructure Project, the approach to the assessment of in-combination effects broadly follows the Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment guidance (Ref 6.5). A

full description of the methodology used for in-combination effects is outlined in **Volume 8, Appendix 1.4.A: Topic Assessment Methodology**.

## **6.4 Assessment**

- 6.4.1 A full assessment of the potential in-combination and cumulative effects is undertaken at a Project level and is discussed in **Volume 7: The Project and Cumulative Effects**.



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## Figures

Figure 6.2.1: Location of the Wider Works.

Figure 6.2.2: Wider Works Site.

Figure 6.5.1: Statutory Designated Sites for Nature Conservation in the Wider Area.

Figure 6.5.2: Statutory Designated Sites for Nature Conservation.

Figure 6.5.3: Non-Statutory Designated Sites for Nature Conservation.

Figure 6.5.4: Habitats of Principal Importance and Ancient Woodland.

Figure 6.5.5: Construction Dust Assessment.