

3.5 Onshore Archaeology and Cultural Heritage

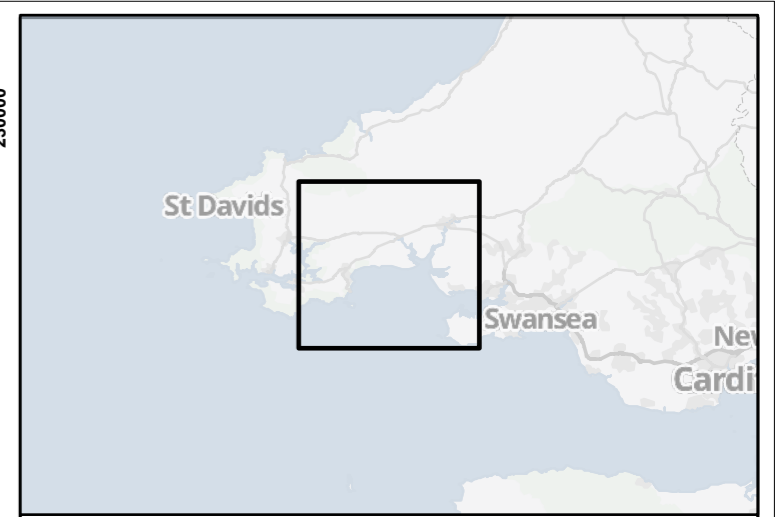
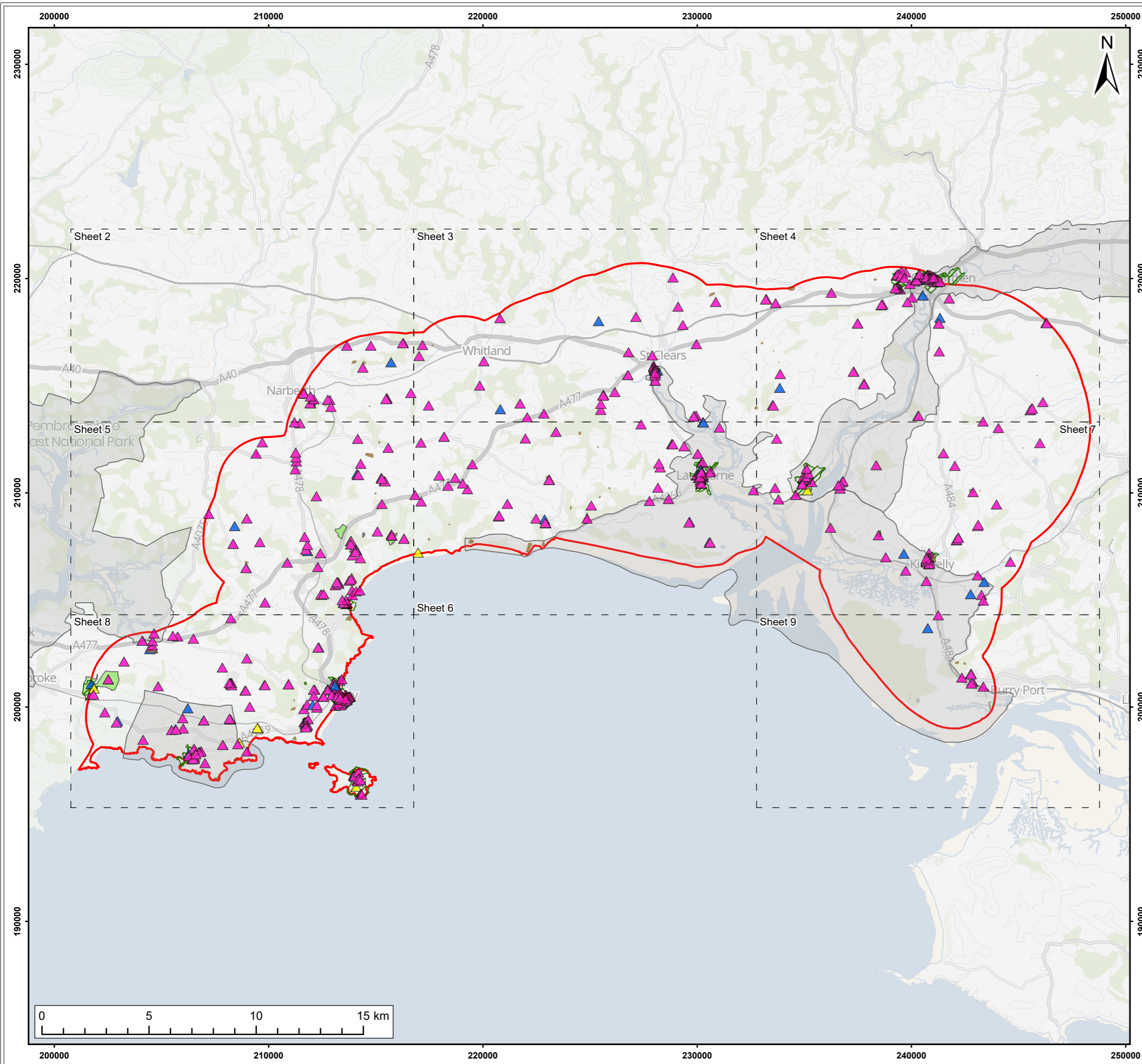
1175. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M and decommissioning stages of the Development on Onshore Archaeology and Cultural Heritage down to MHWS. Receptors seawards of MHWS are covered in **Section 2.10 Offshore Archaeology and Cultural Heritage**.
1176. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Onshore Archaeology and Cultural Heritage receptors in the Development's ES.
1177. The Onshore Archaeology and Cultural Heritage assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:
- **Section 1.5 Project Description;**
 - **Section 2.10 Offshore Archaeology and Cultural Heritage;**
 - **Section 3.3 Flood Risk and Hydrology;**
 - **Section 3.6 LVIA;**
 - **Section 3.7 Traffic and Transport;** and
 - **Section 3.8 Noise and Vibration.**

The following questions are posed to consultees to help them frame and focus their response to the Onshore Archaeology and Cultural Heritage scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Onshore Archaeology and Cultural Heritage Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on the Onshore Archaeology and Cultural Heritage resulting from the Project been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

3.5.1 Onshore Study Area

1178. For the purpose of scoping, the Onshore Study Area for Onshore Archaeology and Cultural Heritage has been developed with reference to historic assets within the current extent of the Onshore Scoping Boundary (**Figure 3.5.1**), hereafter referred to as the Onshore Archaeology and Cultural Heritage Study Area.
1179. The Onshore Archaeology and Cultural Heritage Study Area within the EIA would be refined once the locations of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are selected.
1180. Once refined, the Onshore Archaeology and Cultural Heritage Study Area to be used in the EIA would be agreed with consultees and defined in line with standard industry practice. The Onshore Archaeology and Cultural Heritage Study Area is likely to include, but not be limited to the following:
- Information pertaining to known non-designated historic assets within 500m of the Onshore Development Area;
 - Information from within 500m of the Onshore Development Area pertaining to the potential for buried archaeological remains and previously unrecorded above ground historic assets to be present within the Onshore Development Area;
 - Designated historic assets within 1km of the Onshore Development Area and 3km of the Onshore Transmission Station(s) Zone, to inform a setting assessment of historic assets identified as potentially being affected by the Development through a change in their setting. These would be identified through professional judgement supported by consideration of a ZTV.
1181. In accordance with Stage 1 of *The Setting of Historic Assets in Wales* (Cadw, 2017a) all heritage assets with the potential to be affected by change to setting would be identified and this scope of assessment would be agreed. Where designated historic assets are identified as not having the potential to be affected, these would not be assessed further. As such, a refined scope of assessment of effects arising through change to setting would be agreed through the EPP with Heneb and Cadw and relevant local authorities, pending any refinement of the Onshore Development Area and the proposed location of infrastructure within the Onshore Transmission Station(s) Zone.



Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
Gwynt Glas Offshore Wind Farm Scoping Report

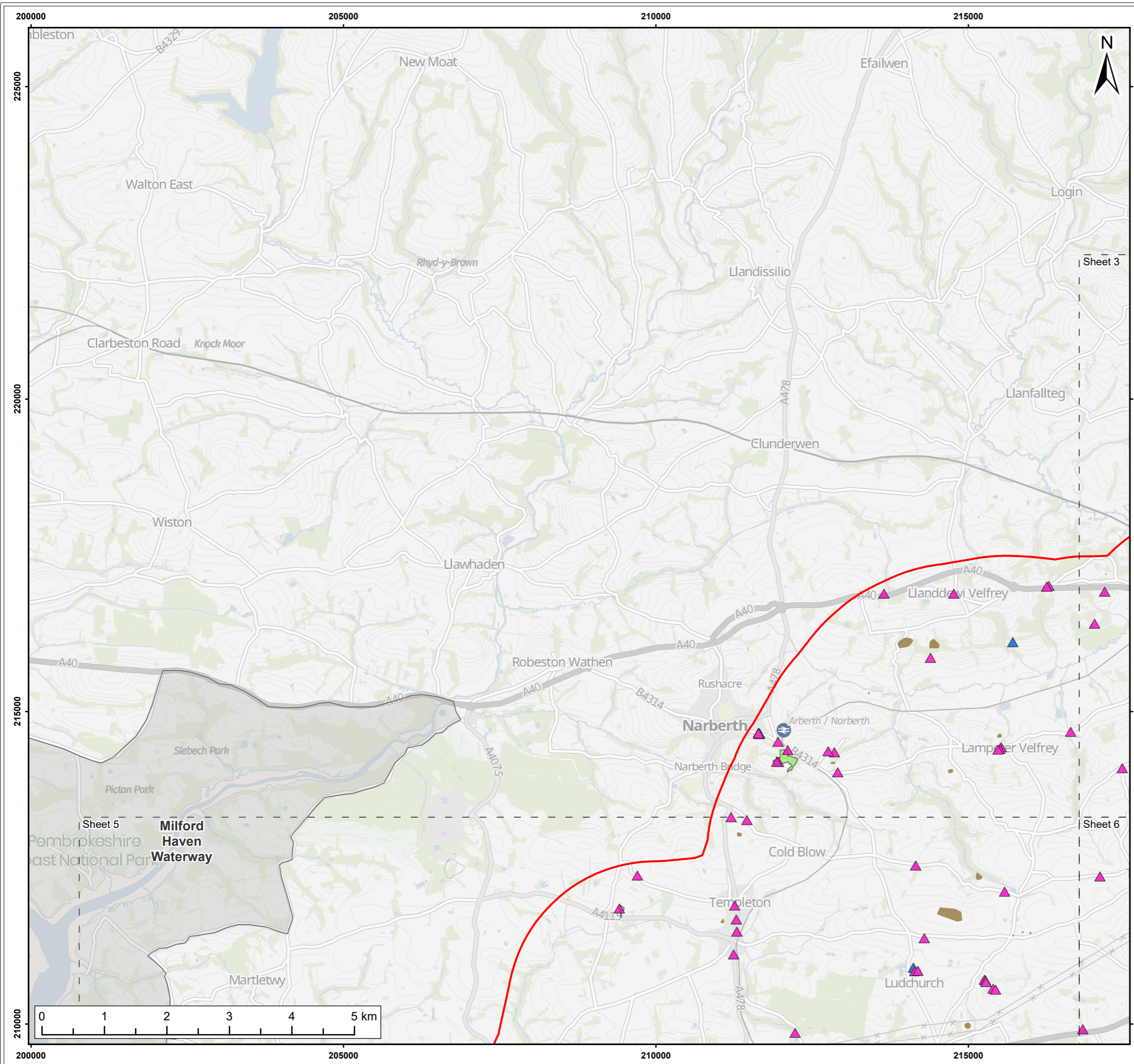
Title:
Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 1 of 9)

Figure: 3.5.1 | Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:175,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ II
- ▲ II*

- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project: Gwynt Glas Offshore Wind Farm Scoping Report

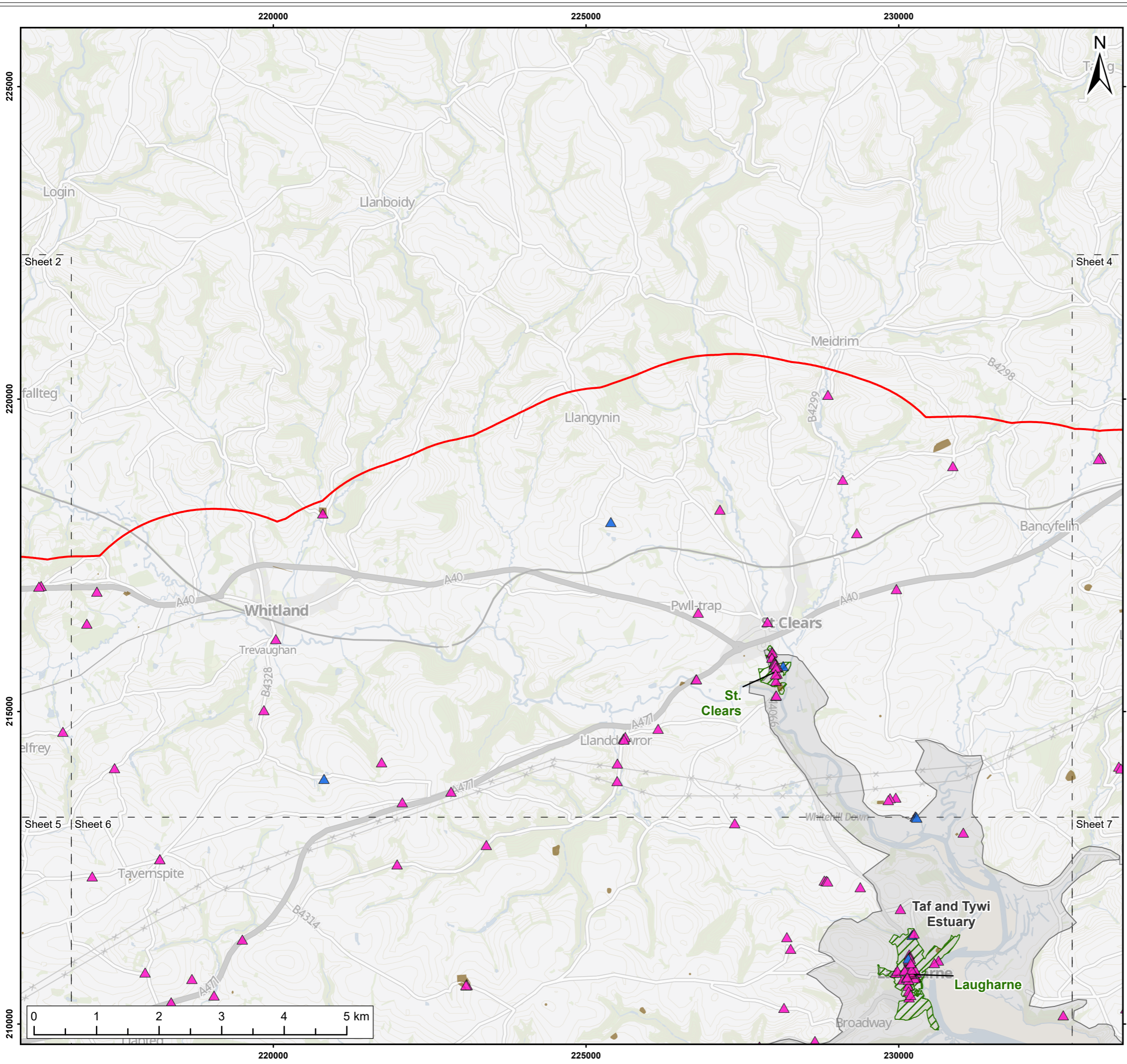
Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 2 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
 Gwynt Glas Offshore Wind Farm Scoping Report

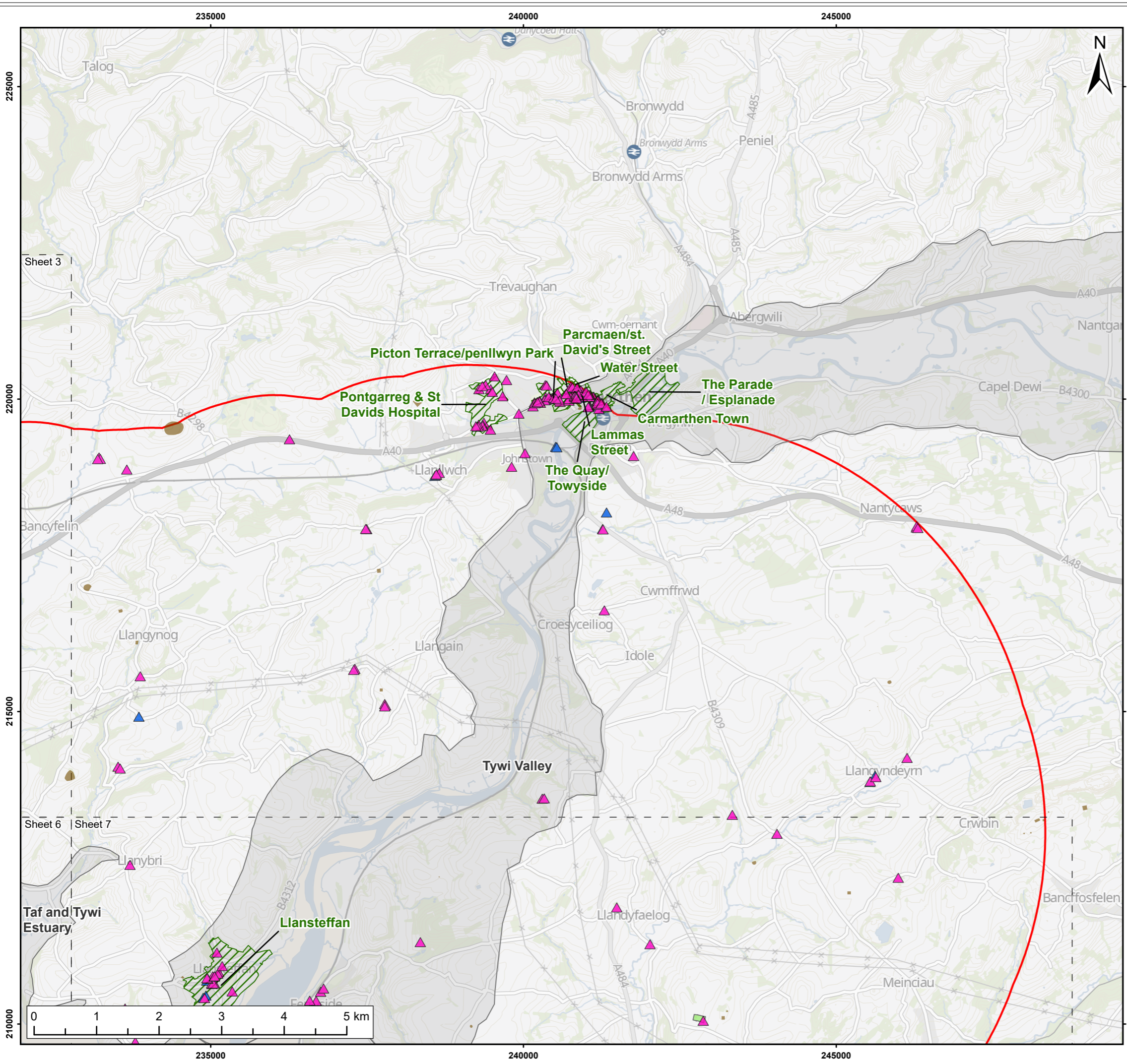
Title:
 Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 3 of 9)

Figure: 3.5.1 | Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
 Gwynt Glas Offshore Wind Farm Scoping Report

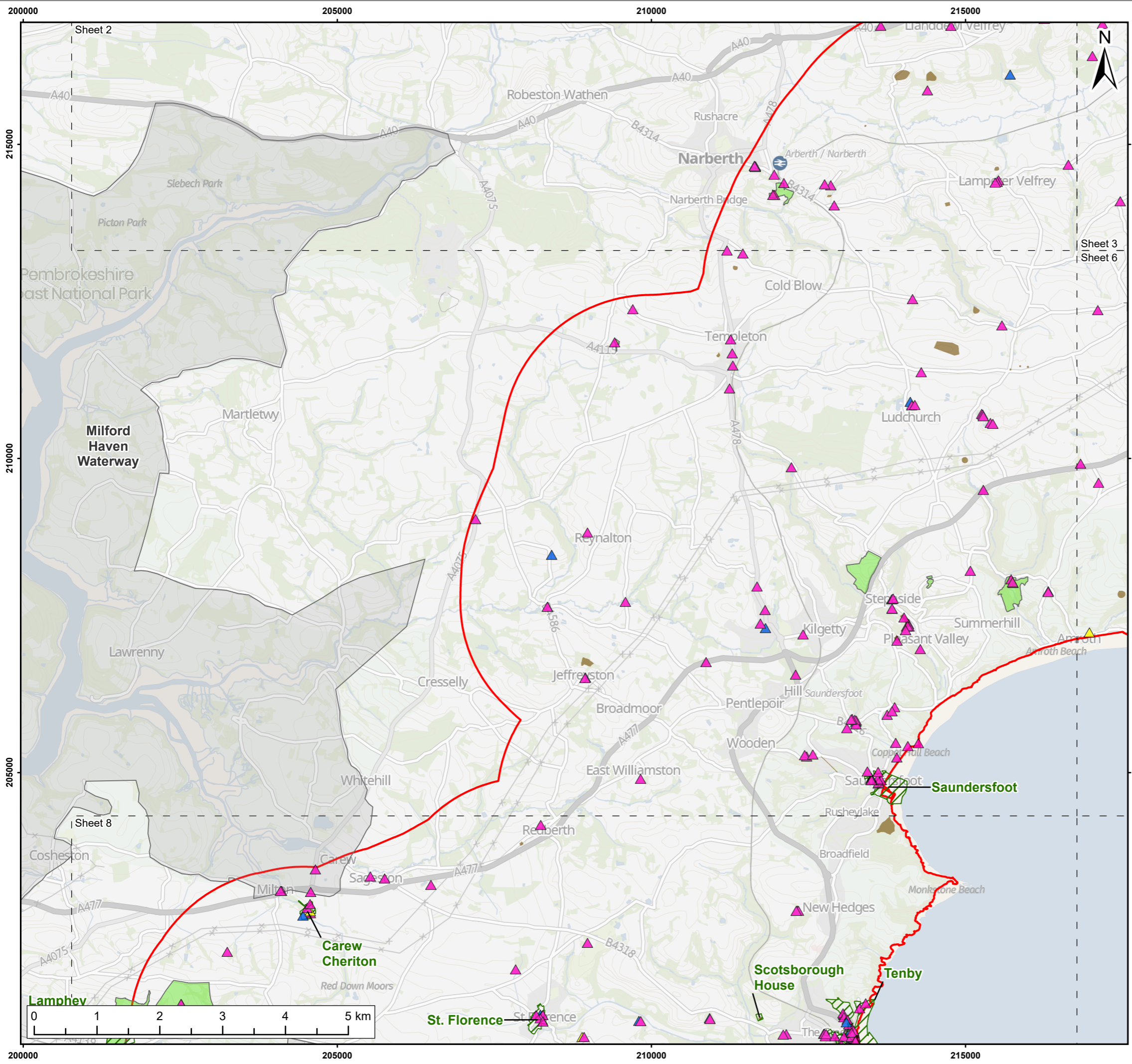
Title:
 Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 4 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project: Gwynt Glas Offshore Wind Farm Scoping Report

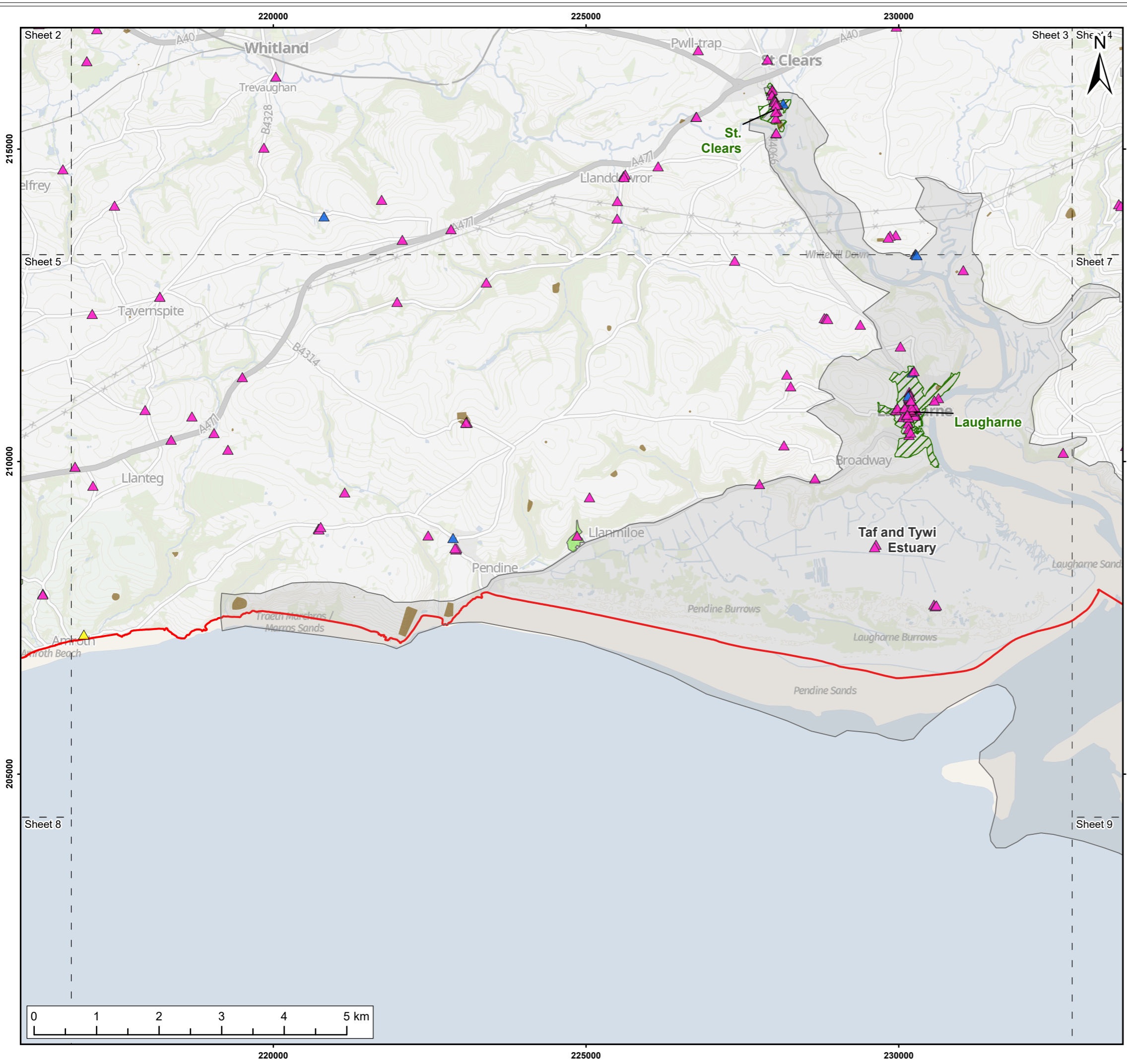
Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 5 of 9)

Figure: 3.5.1 | Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project: Gwynt Glas Offshore Wind Farm Scoping Report

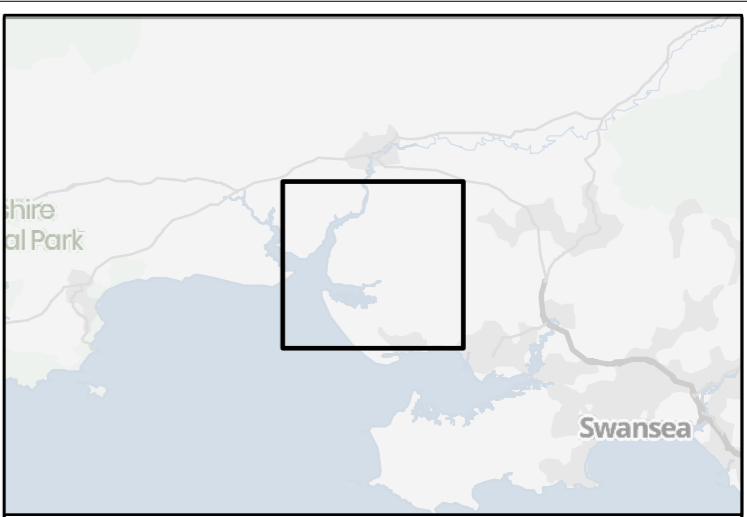
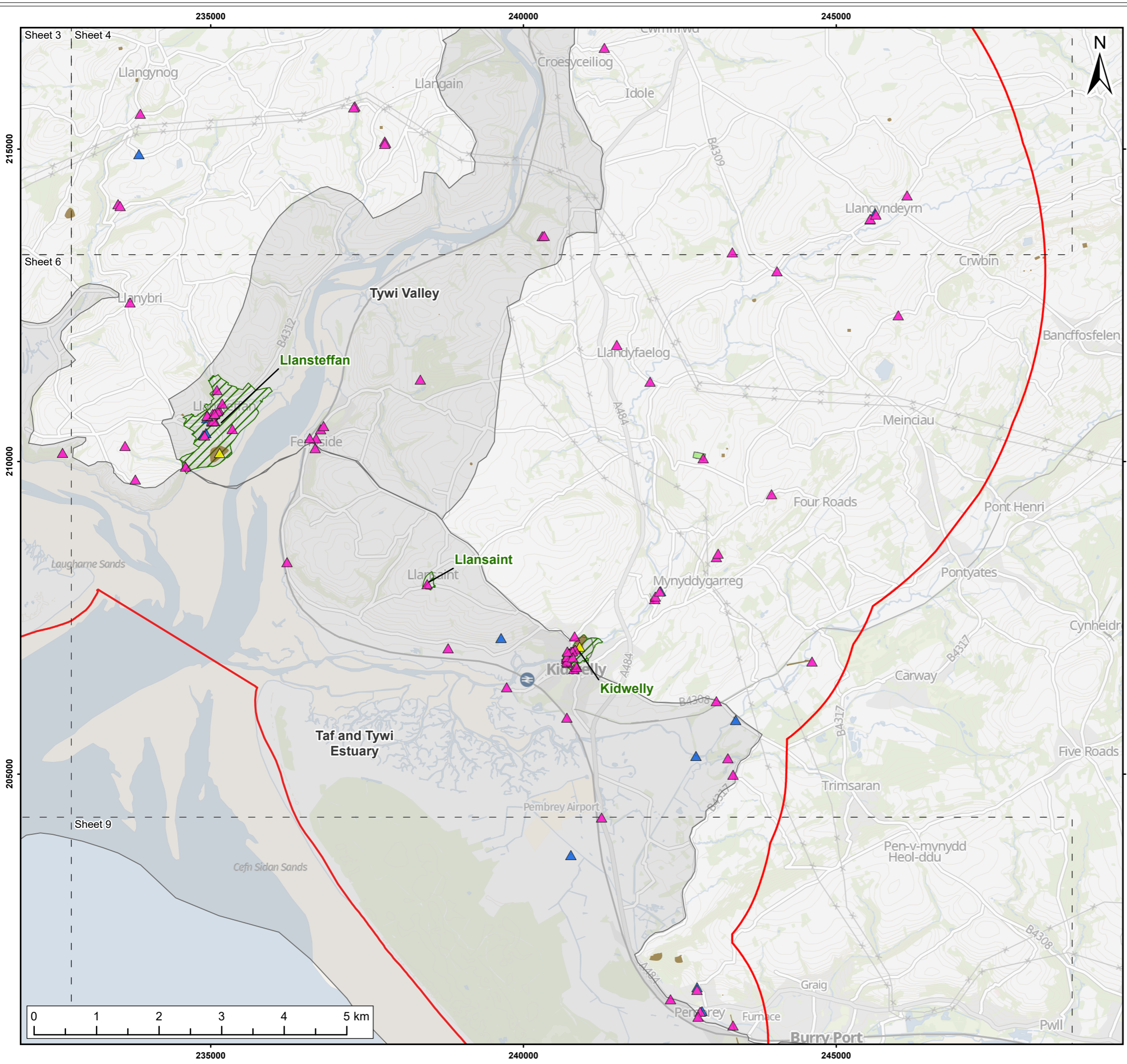
Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 6 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

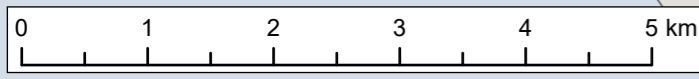
Project: Gwynt Glas Offshore Wind Farm Scoping Report

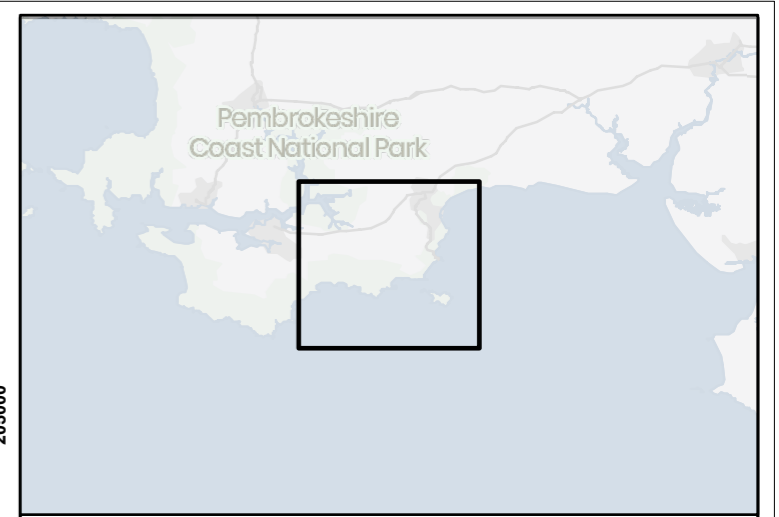
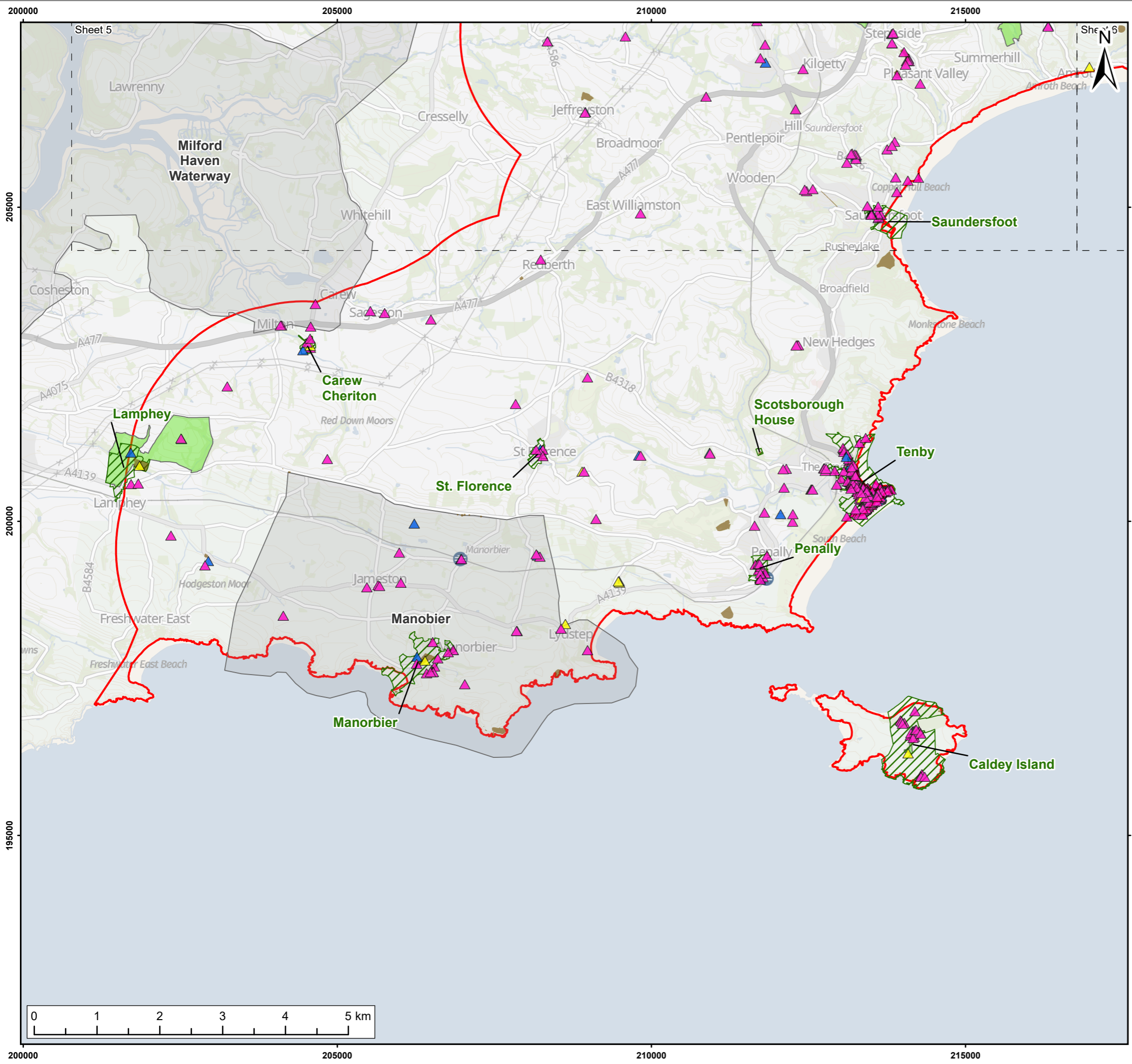
Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 7 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)
- Registered Historical Parks and Gardens (RHPG)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project: Gwynt Glas Offshore Wind Farm Scoping Report

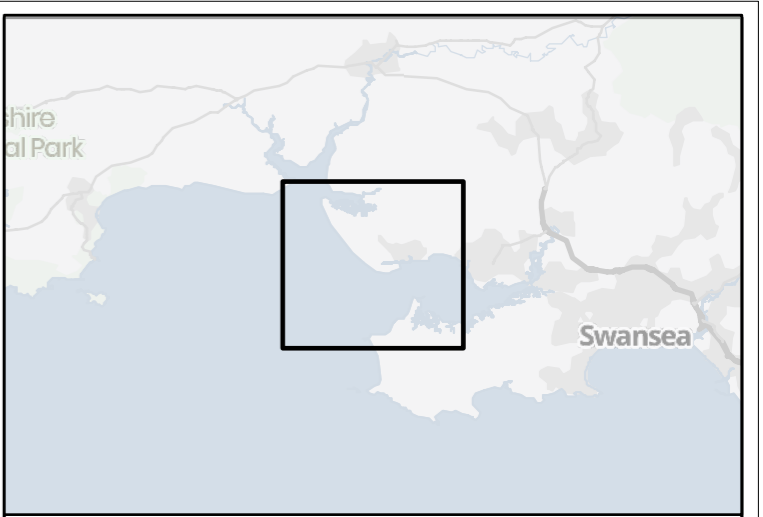
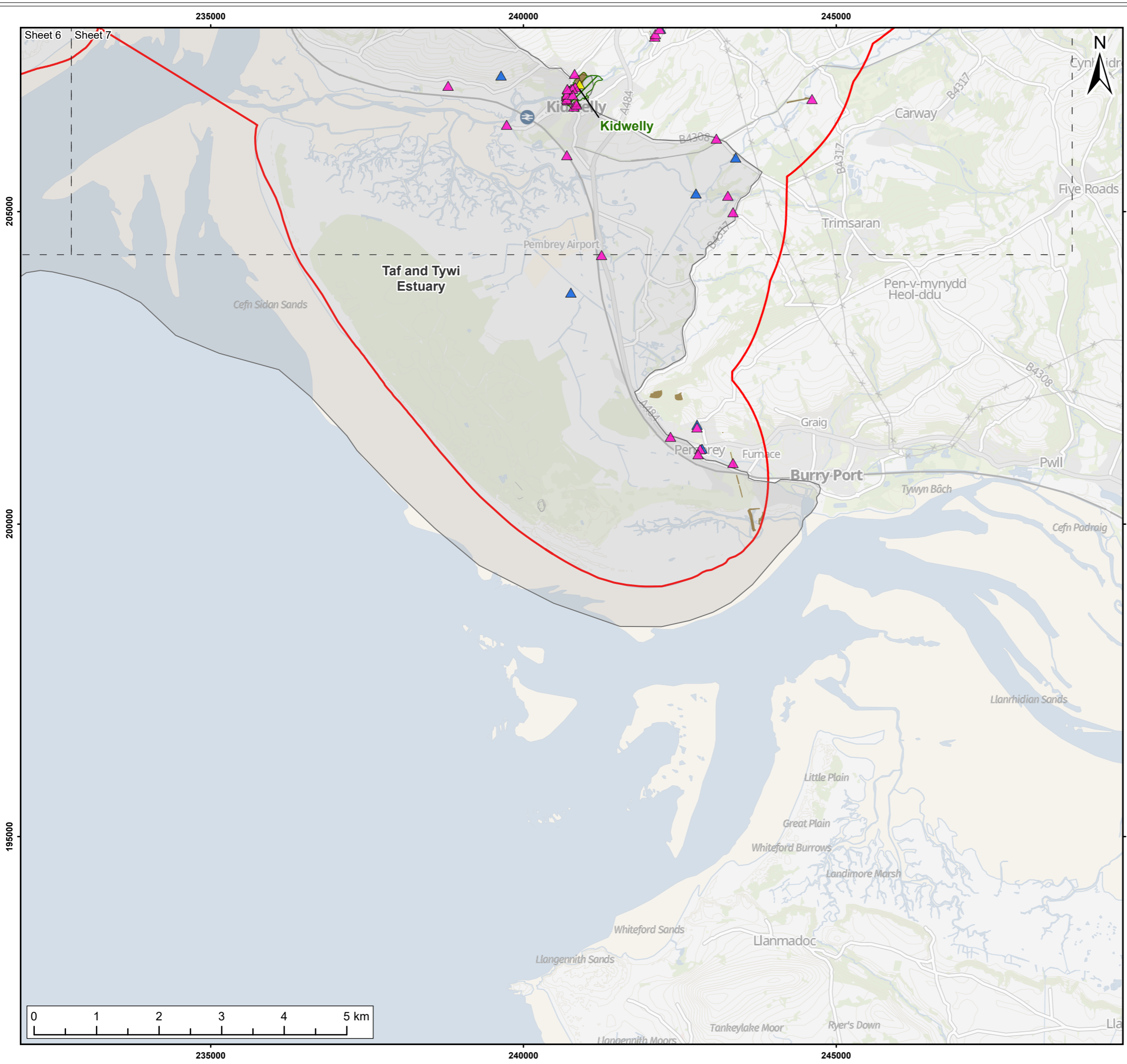
Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 8 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid





Legend:

- Onshore Scoping Boundary / Onshore Archaeology and Cultural Heritage Study Area
- Sheet Extent Box

Listed Building

Grade:

- ▲ I
- ▲ II
- ▲ II*

- Conservation Area
- Scheduled Monument
- Registered Historical Landscape (RHL)

Source: © Haskoning UK Ltd, 2026. © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project: Gwynt Glas Offshore Wind Farm Scoping Report

Title: Onshore Archaeology and Cultural Heritage Designated Historic Assets within Scoping Area (Sheet 9 of 9)

Figure: 3.5.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0080

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	24/03/2026	MW	MJ	A3	1:60,000

Co-ordinate system: British National Grid



3.5.2 Baseline Environment

1182. The Onshore Archaeology and Cultural Heritage Study Area lies across the counties of Pembrokeshire and Carmarthenshire, extending from the Taf and Towy Estuary and the southern Pembrokeshire coastline in the south, northwards toward the historic towns of Carmarthen and Whitland. This region encompasses a diverse landscape of estuarine environments, rolling lowlands, and upland hinterlands which have evidence of human occupation dating back to the prehistoric period.
1183. Evidence for early human presence is well documented within the Onshore Archaeology and Cultural Heritage Study Area, with key Palaeolithic and Mesolithic sites including Coygan Cave near Laugharne, Hoyle's Mouth and Little Hoyle at Tenby, and Caldey Island (Research Framework for the Archaeological of Wales 2016). Excavations at Coygan Cave have produced Neanderthal handaxes dating between roughly 64,000 and 38,000 BC, confirming occupation by hunter-gatherer groups exploiting coastal resources during fluctuating climatic conditions (Walker 2018). These findings align with the broader Palaeolithic record for Wales, where repeated phases of occupation and reoccupation occurred in response to environmental change (Heneb 2011).
1184. During the Neolithic and Bronze Age, south-west Wales developed a rich ritual and ceremonial landscape most notably evidenced through surviving megalithic tombs, burial cairns, stone circles, henges, and later Bronze Age barrows. The region's prehistoric funerary and ritual monuments have been extensively surveyed, with more than 1,100 such sites identified across Pembrokeshire, Ceredigion and Carmarthenshire, demonstrating dense ritual activity from c. 4000 to 1000 BC (ci, 2006). Settlement evidence is found at smaller sites, often associated with flint, pottery, and stone tools, such as Cwmifor to the north of the Onshore Archaeology and Cultural Heritage Study Area.
1185. By the Iron Age, the landscape saw the development of hillforts and defended enclosures, often occupying prominent vantage points overlooking river valleys and coastal plains. Whilst the hillforts are the most visible legacy of this era evidence also survives for settlement sites in lowland areas and river valleys, the buried archaeology visible as cropmarks and soilmarks on aerial photographs (Richie 2018).
1186. The Roman period introduced new layers of settlement and military infrastructure, most prominently the civitas centre at Moridunum (modern Carmarthen) which was established around AD 75 as a Roman auxiliary fort and later developed into a planned town with a street grid, public buildings, bathhouses, metalworking areas and an amphitheatre (Thomas 2025). Archaeological investigations show continuity of occupation into the 4th century, with the settlement functioning as a key administrative hub in Roman Wales (Thomas 2025). The rural sites that have been excavated suggest a landscape of scattered farms, which may have been occupied within the Iron Age with limited evidence of the higher status villa sites such as those seen in south-east Wales.
1187. Early medieval south-west Wales saw a transitional period marked by the decline of material culture of the Romano-British period, reflecting the withdrawal of Roman authority and the formation of the Kingdom of Dyfed. This period was influenced by Irish settlement and the expansion of the church, with ecclesiastical sites becoming central places in the landscape tied into patterns of landholding and exploitation of resources (Vousden 2021).

1188. Following the Norman Conquest, the region saw widespread castle-building, the foundation of medieval towns, and the consolidation of a dispersed rural settlement pattern under Welsh and later Anglo-Norman tenurial systems. Settlements expanded around these centres, supported by ecclesiastical foundations, manorial estates, and emerging agricultural systems shaped by medieval landholding practices.
1189. From the post-medieval period into the Industrial Revolution, the landscape experienced significant industrial and agricultural change, including:
- Mining, particularly the exploitation of high-grade anthracite in Pembrokeshire and Carmarthenshire, with a long history of coal extraction dating from at least the late medieval period and expanding dramatically in the 18th and 19th centuries.
 - Milling, evidenced by medieval and post-medieval mill sites across west Wales, reflecting the centrality of water-powered industry in rural economies.
 - Agricultural improvement and enclosure, which reshaped field systems and rural settlement morphology, paralleled by the rise of estate-driven architectural development.
 - Coastal reclamation, upland grazing, and later afforestation, all contributing to landscape modification.
1190. Within the Onshore Archaeology and Cultural Heritage Study Area, there are 1,129 designated historic assets as shown in **Figure 3.5.1**, comprising:
- 132 Scheduled Monuments;
 - 982 Listed Buildings (21 Grade I, 72 Grade II* and 889 Grade II);
 - 22 Conservation Areas;
 - 10 Registered Historical Parks and Gardens (RHPG); and
 - 5 Registered Historical Landscapes (RHL).
1191. The 132 Scheduled Monuments within the Onshore Archaeology and Cultural Heritage Study Area are focused on recurring themes of defence, ritual and religion, settlement, industry, and transport. They comprise prehistoric sites and hillforts, medieval castles and religious complexes, deserted settlements and domestic sites, later industrial remains such as ironworks and collieries, and key transport features including bridges, tramroads, and coastal installations.
1192. The Onshore Archaeology and Cultural Heritage Study Area contains several historic towns and medieval villages and hamlets, such as Tenby, Saundersfoot, St Clears, Laugharne, Carmarthen, Kidwelly and Manorbier many of which are protected as Conservation Areas and contain a substantial portion of the Listed Buildings within the Onshore Archaeology and Cultural Heritage Study Area.
1193. There are 10 RHPG, seven within Pembrokeshire and three within Carmarthenshire. They include a range of medieval monastic and castle precincts, 18th and 19th century formal and picturesque estate gardens.
1194. The Onshore Archaeology and Cultural Heritage Study Area contains five RHLs which represent some of the most historically significant and environmentally sensitive landscape areas in Wales, these include:
- Stackpole Warren (asset reference HLW (D) 12) - Special historic landscape;

- Manorbier (asset reference HLW (D) 13) - Special historic landscape;
- Milford Haven Waterway (asset reference HLW (D) 3) - Outstanding landscape of national importance;
- Tywi Valley (asset reference HLW (D) 5) - Outstanding cultural landscape centred on long-established settlement, agriculture, and transport routes; and
- Taf and Tywi Estuary (asset reference HLW (D) 9) - Outstanding landscape with a strong medieval, early-modern and estuarine character.

1195. Within the wider landscape there is anticipated to be a generally high potential for buried archaeological remains dating from the prehistoric to modern periods, based on the results of previous archaeological work in the region. It should be noted that this potential varies across the Onshore Archaeology and Cultural Heritage Study Area, determined by a number of factors related to preferences for site selection in antiquity, as well as site-formation and taphonomic processes. Further work (as set out in **Sections 3.5.3** and **3.5.4** below) is necessary to refine that understanding of potential as it applies to specific areas and sites within the Onshore Archaeology and Cultural Heritage Study Area.

1196. Due to the current size of the Onshore Archaeology and Cultural Heritage Study Area, data for non-designated historic assets from the Heneb HER has not been acquired at this stage. The Heneb HER data would be acquired to inform the subsequent EIA process.

3.5.3 Data Sources

1197. **Table 3.5.1** outlines existing primary data that have been used to inform this section and would also be used to inform the EIA.

Table 3.5.1 Data Sources to Inform the Onshore Archaeology and Cultural Heritage Assessment

DATA SOURCE	DATA CONTENTS
BGS	Historic borehole logs and the wider geological background for the region.
Cadw	Statutory designated historic assets (including Listed Buildings, Scheduled Monuments, Registered Parks and Gardens, RHL, Battlefields and World Heritage Sites).
Heneb: Dyfed HER data	Contains data on all recorded non-designated historic assets. The data includes archaeological, historic landscape character and historic building information. Information on previous events (archaeological surveys and investigations) will also be obtained.
The RCAHMW data	Further details of archaeological sites, monuments, buildings and maritime sites in Wales.

Gwynt Glas Offshore Wind Farm Scoping Report

DATA SOURCE	DATA CONTENTS
National Library of Wales, National Library of Scotland, Carmarthenshire and Pembrokeshire Historic Archives and other cartographic and relevant documentary material websites	Historic (OS and Tithe) mapping in digital format. Information on other historic maps and documentary material.
NRW	Light Detection and Ranging (LiDAR) imagery
ZTV Model	A ZTV produced by the LVIA team would be assessed to help inform settings assessment. Where appropriate, heritage specific visualisations would also be requested and coordinated through the LVIA team, as the settings assessment progresses.
Carmarthenshire and Pembrokeshire Conservation Areas	Information of spatial extents and relevant appraisals of Conservation areas.
Existing archaeological studies and published source	Background information on the archaeology of the area, including the results of previous archaeological assessments, evaluation and investigations, where available.

1198. In addition to the data in **Table 3.5.1**, **Table 3.5.2** describes the surveys that will be undertaken to support the assessment. Survey methodologies will be agreed in advance with stakeholders where possible and additional survey types may be considered necessary following the initial DBA work (i.e. fieldwalking, targeted metal detecting).

Table 3.5.2 Site-Specific Survey Data

DATA SET	SPATIAL COVERAGE	ANTICIPATED SURVEY TIMINGS
Walkover Survey	Targeted areas identified through desk-based baseline collation would be visited to identify current land use and any potential unrecorded non-designated historic assets, as well as ground truthing of certain designated and non-designated assets where required.	To inform the EIA (Anticipated to be 2026 to 2027).
Setting Assessment Site Visits	Historic assets identified as potentially being affected by the Development (through a change in their setting impacting heritage significance) would be visited to inform the setting assessment.	To inform the EIA (Anticipated to be 2026 to 2027).

DATA SET	SPATIAL COVERAGE	ANTICIPATED SURVEY TIMINGS
Archaeological DBA	The DBA would be used to investigate the need for subsequent surveys (both non-intrusive and intrusive evaluation approaches), within the Onshore Development Area, to inform the DCO application and where appropriate, inform the scope and programme of those surveys.	To inform the EIA (Anticipated to be 2026 to 2027)
Geoarchaeological DBA	Would determine the scope of any required bespoke approaches to onsite monitoring of engineering led site / GIs work and whether any further bespoke approaches would be required.	To inform the EIA (Anticipated to be 2026 to 2027)
Geophysical Survey	Geophysical survey to be undertaken (scope and extent TBC); areas to be surveyed identified through desk-based baseline collation and assessment activity, e.g. Aerial photographic and LiDAR analysis. These would include sample areas of seemingly 'blank' land, if / where no features were identified in the DBA Techniques proposed for this survey include magnetometry, and any other techniques deemed as required (appropriate and proportionate) following the findings of the DBA.	To inform the EIA (Anticipated to be 2027 to 2028).
Archaeological and Geoarchaeological elements to any engineering-led site / GI work	Bespoke approaches, including the possibility of onsite monitoring and watching brief associated with any engineering-led site / ground investigation work (SI / GI or equivalent), if / when applicable e.g. test pits, boreholes etc.	Dependant on GI programme

1199. Following these initial baseline surveys, the requirement for initial targeted archaeological evaluation (e.g. trial trenching) would be considered and discussed with stakeholders as part of the EPP. If targeted trial trenching is required it would be undertaken at areas where the baseline surveys and geophysical surveys have identified a high potential for buried archaeological remains to be present, and / or at key areas of the onshore development infrastructure such as substations and landfall and / or at other related pinch-points.

3.5.4 Approach to Impact Assessment

1200. Assessment of the Onshore Archaeology and Cultural Heritage would be an iterative and ongoing process that would be combined with ongoing site selection work to refine the Onshore Development Area, including the Onshore Transmission Station(s) Zone.

1201. The impact assessment upon the Onshore Archaeology and Cultural Heritage would follow a heritage significance-based approach to historic environment decision-making as set out in national planning policy and the NPS and outlined in Heritage Impact Assessment in Wales (Cadw 2017a). The assessment of effects arising through change to setting would be undertaken in accordance with the methodology set out in The Setting of Historic Assets in Wales (Cadw, 2017a).

1202. The assessment would define the heritage significance of any historic assets that may potentially be affected, set out the change to that asset and how that change would affect its heritage significance, and would identify the significance of any effect in EIA terms.
1203. A search of the Heneb HER would be undertaken once the Onshore Development Area has been identified. The data would also form the basis of the EIA non-designated baseline data set. Further research would also be undertaken to inform the baseline data, including assessment of archaeological archive reports, published archaeological articles, monographs and other sources, which would be presented as an Archaeological Desk-Based Assessment (ADBA), compiled in accordance with Standard and guidance for historic environment DBA (Chartered Institute for Archaeologists (CIfA) 2020).
1204. Identification of historic assets and areas of defined archaeological potential that would potentially be affected by the Development would be undertaken through spatial analysis of the heritage data within a GIS framework.
1205. The assessment would be supported by a series of related technical reports, annexes and appendices. As a minimum these would include ADBA, Geoarchaeological DBA and an Assessment of the Significance of the Impact of Development on Historic Landscape (ASIDOHL) 2 Assessment.
1206. The ADBA would include assessment of aerial photography, LiDAR analysis and review of cartographic sources. This would include a historic map regression exercise of the Onshore Development Area and / or targeted parts of the Landfall, Onshore Export Cable Corridor and infrastructure within the Onshore Transmission Station(s) Zone. The map regression exercise would be undertaken to identify changes in land use throughout history and would provide further information on potential historic assets.
1207. Other technical reports to be produced which would inform the baseline environment and ultimately inform assessment, may include:
- Geophysical survey;
 - Initial targeted intrusive evaluation (trial trenching), if required, relevant and undertaken pre-application. This would be confirmed through progression of the iterative approach to survey work and ongoing consultation with Heneb; and
 - Any archaeological and geoarchaeological approaches to be applied to engineering-led ground / site investigation, if / when applicable and undertaken (to be determined by the geoarchaeological DBA) (e.g. monitoring and / or watching briefs).
1208. Initial consideration of the setting of historic assets and any potential for impact upon heritage significance would be undertaken as part of the setting assessment. This will be informed by walkover surveys and site visits. This would also include an assessment of the historic landscape character of the Development and assess impacts on the RHL in line with the ASIDOHL 2 Assessment Guidance (Cadw *et al.* 2007). A full consideration of, and conclusions regarding, setting impacts would be made in the final ES following finalisation of the Development design.
1209. Impacts from offshore infrastructure on the setting of onshore historic assets would be considered in **Section 2.10 Offshore Archaeology and Cultural Heritage**.
1210. Identification of any areas that would potentially be subject to intrusive archaeological evaluation as part of the EIA process will be decided through consideration of the baseline data and non-

intrusive surveys, and would be discussed and agreed in consultation with Cadw and Heneb as part of the EPP.

1211. Technical consultation with Cadw and Heneb and relevant local authorities would be included as part of the EPP (see **Section 1.7 Consultation**). This would help to identify and agree the primary methodologies, present initial findings and ensure potential historic environment issues and risk are identified and considered during the EIA.

1212. The EIA would be undertaken with reference to and / or in accordance with the following primary legislation, policy, standards and guidance:

- Historic Environment (Wales) Act 2023;
- Welsh Government PPW (Edition 12, February 2024);
- NPS (EN-1), (EN-3) and (EN-5) (DESNZ) (2025a,b and c);
- TAN 24: The Historic Environment;
- Cadw Best Practice Guidance:
- Guide to Good Practice on using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process (Edition 2) (Countryside Council for Wales, Cadw and ICOMOS UK (2007);
- Conservation Principles (2011);
- Heritage Impact Assessment in Wales (2017a);
- Setting of Historic Assets in Wales (2017b);
- ClfA Standard and guidance for historic environment DBA (ClfA, 2020a);
- Universal guidance for archaeological field evaluation (ClfA, 2023a);
- Standard for archaeological field evaluation (ClfA, 2023b);
- Standard and guidance for archaeological geophysical survey (ClfA, 2020b); and
- Principles of Cultural Heritage Impact Assessment in the UK (IEMA), IHBC and ClfA, 2021).

3.5.4.1 Receptors

1213. A summary of the likely Onshore Archaeology and Cultural Heritage receptors requiring consideration in the assessment process are presented below:

- Designated Historic Assets, including:
 - Scheduled Monuments;
 - Listed Buildings;
 - Conservation Areas;
 - Registered Parks and Gardens; and
 - Registered Historical Landscapes;
- Non-designated Historic Assets, including:
 - Buried and above ground historic assets;

- Geoarchaeological and paleoenvironmental remains; and
- Historic Landscapes (including RHL).

3.5.5 Potential Impacts

1214. Potential impacts to historic assets (including below ground archaeological remains and previously unrecorded above ground remains) include both physical impacts, as well as impacts arising from changes in the setting of designated and non-designated historic assets which could affect heritage significance.

3.5.5.1 Potential Impacts During the Construction Stage

1215. Due to the current size of the Onshore Archaeology and Cultural Heritage Study Area, at this stage a general assessment of potential impacts associated with the onshore elements of the construction stage on specific sensitive receptors is presented below.

1216. Construction activities which could affect historic assets include:

- Any intrusive groundworks, such as trenchless cable installation, piling, draining, and open cut trench excavation;
- Construction of temporary works areas or long term above ground infrastructure such as for the infrastructure within the Onshore Transmission Station(s) Zone; and
- General construction activities such as plant movement or increased traffic movements

3.5.5.1.1 Physical impacts to designated historic assets and to known and unknown non-designated historic assets

1217. A physical impact is one in which construction works involved with the Development (e.g. excavations, groundworks) result in a physical change to the fabric of a historic asset (e.g. partial or complete removal). These effects could theoretically also arise from change to hydrological and hydrogeological connectivity with deposits outside the area of physical effects. In practice however, no widespread waterlogged archaeological remains are anticipated to be present and any such change to hydrological or hydrogeological connectivity would be managed through good practice measures that would be sufficient to preclude any such change outside the Onshore Development Area and would be restricted to localised areas of waterlogging.

1218. Other impacts could include vibration from construction activities affecting the fabric of a historic asset or changes in ground conditions resulting in an effect on preservation conditions.

1219. Physical impacts to historic assets during construction are therefore **scoped in** to the EIA.

3.5.5.1.2 Changes to the setting of designated and non-designated historic assets (including registered and non-RHL), which could affect their heritage significance.

1220. Impacts to the significance of a historic asset may also occur if a development changes the surroundings in which a historic asset is located, experienced, and appreciated (i.e. its setting). Similarly, historic character may also be affected if the Development results in a change to the prevailing landscape character of the area.

3.5.5.1.3 Summary

1221. The potential impacts during construction that would be assessed and are therefore **scoped in** to the EIA include:

- Physical impacts to designated historic assets;
- Physical impacts to known and unknown non-designated historic assets;
- Change to the setting of designated historic assets, which could affect their heritage significance;
- Change to the setting of non-designated historic assets, which could affect their heritage significance; and
- Changes in the setting of historic landscapes which could affect their heritage significance.

3.5.5.2 Potential Impacts During the O&M Stage

3.5.5.2.1 Physical impacts to designated historic assets and to known and unknown non-designated historic assets

1222. Where the Development's onshore infrastructure is buried sub-surface (i.e. infrastructure associated with the buried cable systems), there would be limited potential for further impacts to below ground historic assets during the operation stage. This is because such loss would have occurred during the construction stage. As all physical impacts would be associated with construction works (as described above (see **Section 3.5.5.1**)), it is proposed that physical impacts to historic assets during operation are **scoped out** of the EIA.

3.5.5.2.2 Changes to the setting of designated and non-designated historic assets (including registered and non-RHL), which could affect their heritage significance.

1223. Activity which could have an ongoing impact to Onshore Archaeology and Cultural Heritage includes the presence of infrastructure within the Onshore Transmission Station(s) Zone. Any long term above ground infrastructure has the potential to result in a change to the setting of historic assets, which could affect heritage significance.

1224. Impacts could arise from the visual intrusion of the Developments Onshore Transmission Station(s), which would change views towards and away from historic assets. Impacts could also occur from a perceptible change in noise and lighting, which would change the way historic assets are experienced. The impacts could be both adverse and beneficial, depending on the historic asset, its location, the contribution of the setting to the value of the asset. There is a potential, therefore, for the operation of the Development to result in a significant effect (both adverse and beneficial).

1225. The potential impacts during operation that would be assessed and are therefore **scoped in** to the EIA include:

- Change to the setting of designated historic assets, which could affect their heritage significance;
- Change to the setting of non-designated historic assets, which could affect their heritage significance; and
- Change to the setting of historic landscapes, which could affect their heritage significance.

3.5.5.3 Potential Impacts During the Decommissioning Stage

3.5.5.3.1 Physical impacts to designated historic assets and to known and unknown non-designated historic assets

1226. There would be limited potential for further physical impacts to the onshore historic assets during the decommissioning stage as these impacts would have occurred during the construction stage. The same is anticipated for changes to the setting of historic landscapes. Physical impacts to historic assets and changes to the setting of historic landscapes during decommissioning are therefore **scoped out** of the EIA.

3.5.5.3.2 Changes to the setting of designated and non-designated historic assets (including registered and non-RHL), which could affect their heritage significance.

1227. Impacts to the setting of historic assets which could affect their heritage significance during decommissioning are expected to be similar in nature to those anticipated during construction but of smaller magnitude so are **scoped in** to the EIA.

3.5.5.4 Potential Inter-relationship Impacts

1228. The impact assessment would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts on historic assets are **scoped in** to the EIA.

3.5.5.5 Cumulative Impacts

1229. There is potential for cumulative effects to arise in which other projects or plans could act collectively, with the Development, to affect Onshore Archaeology and Cultural Heritage receptors. Therefore, these effects are **scoped in** to the EIA and would be assessed following the standard approach outlined in **Section 1.8 EIA Methodology**.

1230. The Development could interact with other projects, which also have potential impacts on the Onshore archaeology and cultural heritage resource. These are primarily as:

- Physical impact to the archaeological resource of the immediate and wider area / region; and
- Change in the setting of designated and / or non-designated historic assets which could affect their historic landscape.

1231. Where these impacts occur because of the Development, in combination with other developments in the area with similar associated impacts, there is the potential for the impacts to be of greater significance than when assessed individually. It is therefore proposed that cumulative effects on historic assets are **scoped in** to the EIA.

3.5.5.6 Summary of Impacts

1232. **Table 3.5.3** outlines the impacts which are proposed to be **scoped in** to or **out** of the EIA. This may be refined as additional information and data become available.

Table 3.5.3 Summary of Impacts to be Scoped In (✓) and Out (X) of the Onshore Archaeology and Cultural Heritage Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Physical impacts to designated historic assets	✓	x	x
Physical impacts to known and unknown non-designated historic assets	✓	x	x
Changes to the setting of designated historic assets, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Changes to the setting of non- designated historic assets, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Change to the setting of historic landscapes, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Inter-relationship Impacts	✓	✓ (Onshore Transmission Station(s))	✓
Cumulative Impacts	✓	✓ (Onshore Transmission Station(s))	✓

3.5.6 Potential Mitigation Measures

1233. A number of embedded mitigation measures relevant to the Onshore Archaeology and Cultural Heritage assessment, which is proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
1234. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to CCR impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.
1235. Requirements for any additional mitigation measures would be determined through the EIA.

1236. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

3.6 Landscape Visual Impact

1237. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Landscape and Visual receptors.
1238. This section provides an overview of the baseline landscape and visual environment and sets out the proposed methodology and approach to assessing effects on landscape and visual receptors in the Development's EIA.
1239. The LVIA is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:
- **Section 1.5 Project Description;**
 - **Section 2.11 SLVIA;**
 - **Section 3.1 Terrestrial Ecology and Onshore Ornithology;** and
 - **Section 3.5 Onshore Archaeology and Cultural Heritage.**

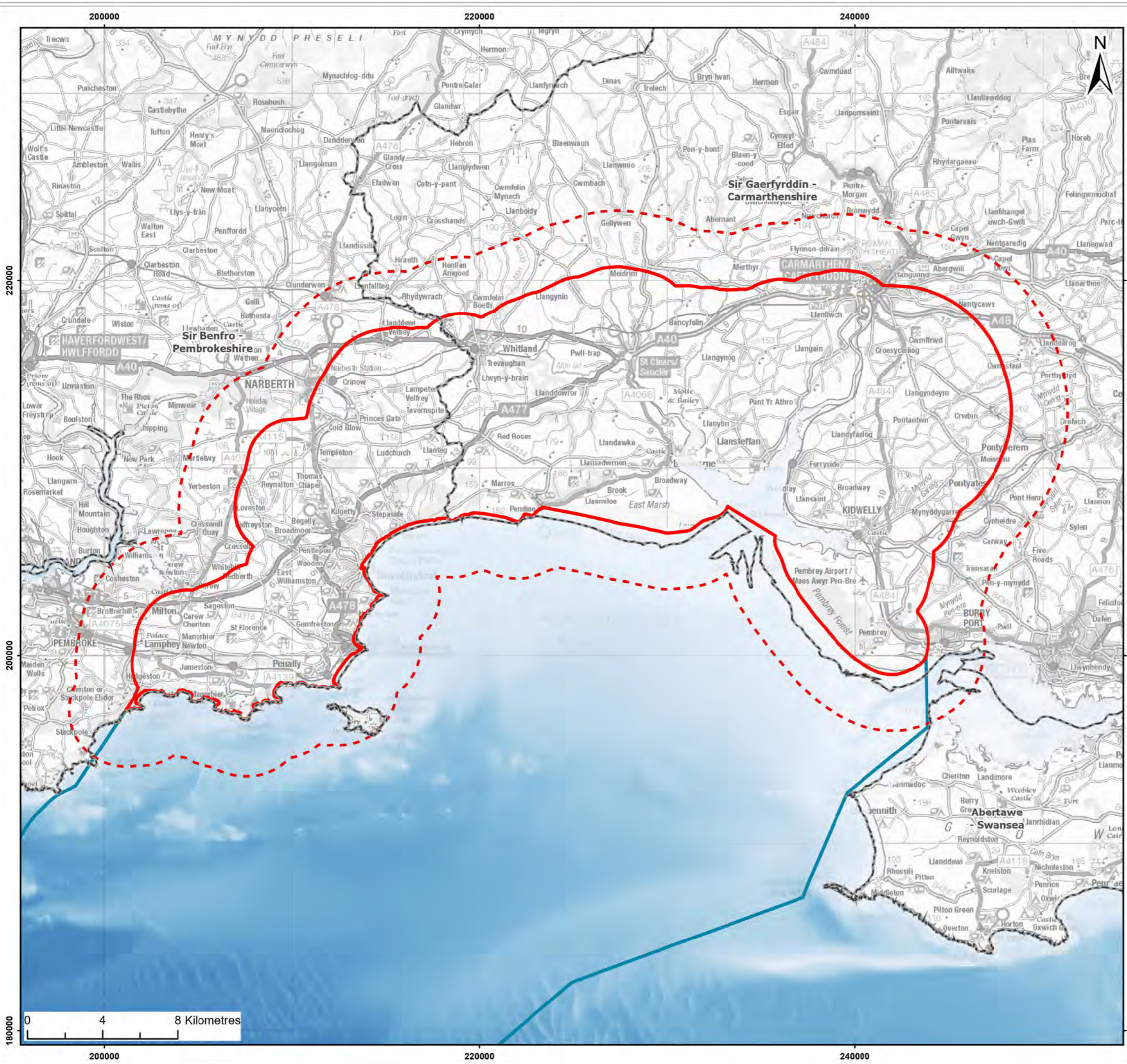
The following questions are posed to consultees to help them frame and focus their response to the **LVIA** scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed LVIA Study area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on landscape and visual receptors resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

3.6.1 Study Area

1240. For the purpose of Scoping, the Study Area for LVIA is the area in the Onshore Scoping Boundary with the following buffers as shown on **Figure 3.6.1**:

- Onshore Transmission Station(s) Zone and a 5 km buffer area around this zone to allow for the potential effects of an Onshore Transmission Station(s) located anywhere in the Onshore Transmission Station(s) Zone; and
 - Onshore Scoping Boundary and a 3km buffer area to allow for the assessment of all potential landfall sites in the Onshore Scoping Boundary and the effects on the coastal setting of the Gower National Landscape, which is situated on the eastern edge of the Onshore Scoping Boundary.
1241. This area has been established based on several factors including relevant guidance (Landscape Institute, 2013), the location and maximum parameters of the onshore infrastructure (including Landfall, the Onshore Export Cable Corridor and the Onshore Transmission Station(s)). Together they form the area within which likely significant effects may occur in the Pembrokeshire, Carmarthenshire and Swansea areas of South Wales (**Figure 3.6.1**). The LVIA Study Area in the EIA would be refined based on the Onshore Development Area once the locations of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are selected.
1242. The initial LVIA Study Area presents a precautionary approach for the Scoping assessment, and it is expected that this initial LVIA Study Area would be refined as the EIA progresses. Significant effects on landscape and visual receptors are anticipated to be more likely to occur close to the onshore infrastructure, with potential for significance reducing with distance towards the edges of the initial LVIA Study Area. The initial LVIA Study Area would be further refined as part of the assessment process to ensure a proportionate approach, focussed on likely significant effect.



Legend:

- Onshore Scoping Boundary
- Offshore Scoping Boundary
- Onshore LVIA Study Area
- Local Authority Boundary

EMODnet Bathymetry (Depth, m)

 33.27
 -66.26

Source: © Haskoning UK Ltd, 2026
 Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
 © Crown copyright and database rights (2026) Ordnance Survey AC0000808122.
 ©EMODnet Bathymetry Consortium (2026): EMODnet Digital Bathymetry (DTM).

Project:
 Gwynt Glas Offshore Wind Farm Scoping Report

Title:
 LVIA Study Area

Figure: 3.6.1 | Drawing No: PC6850-HAS-ZZ-ZZ-DR-GS-0001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/03/2026	BL	NJ	A3	1:200,000
02	25/03/2026	RH	NJ	A3	1:200,000
03	06/05/2026	BL	NJ	A3	1:200,000

Co-ordinate system: OSGB 1936 British National Grid



Haskoning
Enhancing Society Together



Gwynt GLAS



3.6.2 Baseline Environment

3.6.2.1 Introduction

1243. A study of the baseline environment has been undertaken through desk-based research to establish the existing conditions of the landscape and visual resources in the LVIA Study Area. This has involved a review of mapping and aerial photography, planning and policy documents, landscape character assessments and other sources of relevant information. Data would continue to be updated throughout the assessment process.

1244. Key sources of information for the baseline environment studies include:

- OS mapping and aerial photography;
- OS DTM;
- National, regional and local planning policy;
- Published landscape character assessments at national, regional and local levels;
- Management plans for National Landscapes; and
- LANDMAP.

1245. The description of the baseline environment in the EIA would provide a description of the identified landscape and visual receptors, indicating their key characteristics and value, against which the potential change arising from the onshore transmission infrastructure would be assessed.

3.6.2.2 Onshore Landscape Character

1246. The LVIA Study Area occupies an area of land which covers Pembrokeshire, Carmarthenshire and Swansea and extends across a varied landscape (see **Figure 3.6.1** and **Figure 3.6.2**). This landscape includes the broad coastline of Carmarthen Bay, containing sandy beaches and rocky outcrops and a broadly gently undulating agricultural landscape inland from the coast.

1247. There is a hierarchy of published Landscape Character Assessments that describe the baseline landscape character of the LVIA Study Area, at the national and local level.

3.6.2.3 National Landscape Character

1248. The LVIA Study Area includes a number of NLCA, (as shown on **Figure 3.6.4**, including the 'South Pembrokeshire Coast', 'Taf and Cleddau Vales', 'Gwendraeth Vales', 'Taf, Tywi and Gwendraeth Vales', 'Taf, Tywi and Gwendraeth Estuaries' and 'Swansea Bay'. The NLCAs incorporate numerous popular beaches, villages and seaside towns. The coastline is generally described as '*containing vast expanses of sweeping sands which stretches along the coast, backed by extensive sand dunes*'. Inland the landscape character area to the west of the LVIA Study Area is generally described as '*broad, undulating, agricultural lowland. It is also dissected by numerous small, deeply cut minor river valleys, often with wooded sides. It is also crossed by main road and rail routes*'. To the east of the LVIA Study Area the character is described as '*containing marsh grazing and rectilinear field enclosure patterns which merge into areas of rolling hills, ridges and minor valleys*'.

1249. Landfall would be in one of the two NLCAs at the coast, either the south Pembrokeshire Coast NLCA or the Taf, Tywi and Gwendraeth Estuaries NCLA. The Onshore Transmission Station(s) Zone is located primarily in the Gwendraeth Vales NLCA and partially in the Tywi and Gwendraeth Estuaries NCLA, which forms the eastern portion of the Onshore Transmission Station(s) Zone.

1250. In order to ensure consistency with this approach the baseline characterisation for the LVIA would assess landscape effects on LCAs that are landward of the low water mark, which include coastlines. Seascape effects would be assessed on SCAs lying to the seaward side of the high-water mark and beaches and intertidal area within SCAs (see **Section 2.11 SLVIA**).

3.6.2.4 Regional / Local Landscape Character

1251. LCAs have been identified in a variety of characterisation studies in the LVIA Study Area. It is considered that these LCAs represent the most appropriate scale 'reporting units' for the assessment of the onshore infrastructure in the LVIA. LCAs (shown on **Figure 3.6.4**) have been identified in the following published studies:

- PCC 'Landscape Character Assessment', Consultation Draft (July 2019);
- PCNP Authority: Landscape Character Assessment - Supplementary Planning Guidance (Working Draft, Adopted 22 June 2011);
- CCC Supplementary Planning Guidance Landscape Character Assessment for Carmarthenshire (Awaiting publication – Draft approved on 31st March 2025a);
- Carmarthenshire Solar PV Development – Landscape Sensitivity and Capacity Study, CCC (2018);
- Gower Landscape Character Assessment, City and County of Swansea (March 2013); and
- Gower National LMP 2017, City and County of Swansea.

3.6.2.5 LANDMAP

1252. See **Section 2.11 SLVIA** for information on LANDMAP. The LANDMAP visual and sensory evaluation is shown on **Figure 3.6.4**.

1253. The descriptions in the Visual and Sensory LANDMAP aspect area provides further baseline context for the LVIA Study Area.

1254. The coastline of the western portion of LVIA Study Area, in south Pembrokeshire, is generally described as an *'area that is made up of an extensive series of rocky cliffs and steep slopes with some small sheltered coves on the south coast of Pembrokeshire. Panoramic coastal views are available out to the east and west'*. The Visual and Sensory Aspect Area has been given an overall "outstanding" evaluation (**Figure 3.6.4** and **Figure 3.6.5**) which reflects the "outstanding" values given to the area for its scenic quality, integrity and character as well as a "high" value given to the rarity of the area.

1255. Further inland, the area is relatively intensively farmed and it also includes a number of tourism related developments such as caravan parks. Further eastwards in the LVIA Study Area, the area is generally described as *'steep coastal slopes rising above the mouth of the Tywi estuary. Very exposed, with wind clipped trees, with extensive coastal views south and west over the estuary. Areas of bracken and scrub as well as farmed land make the area feel fairly remote'*. The Visual and Sensory Aspect Area for the coastal LCA as well as inland LCAs has been given an overall "high"

evaluation which reflects the character description of *'quiet and largely un-spoilt. It has spectacular coastal views, overlooking the Tywi estuary as well as distant views to the Gower'*.

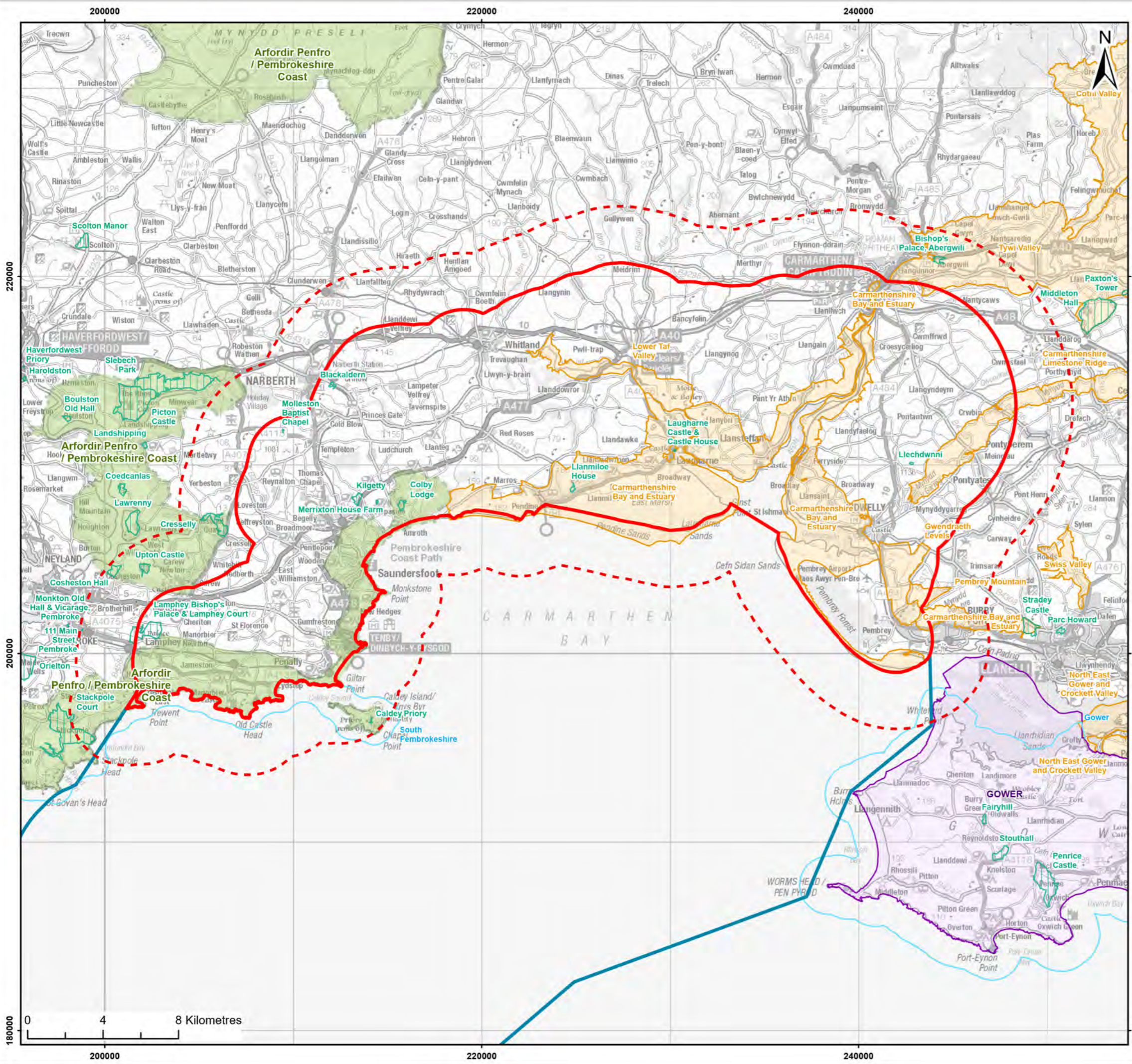
1256. Further eastwards, the beach abuts the coastal grazing levels inland and Pembrey Country Park and Forest (Nature Reserve). The Visual and Sensory Aspect Area for the coastal LCA as well as inland LCAs has been given an overall "outstanding" evaluation on account of the quality of the landscape, and it being unspoilt, together with the sensory experience it offers of the Carmarthenshire coast.
1257. Further inland, the LANDMAP Visual and Sensory rating tends to reduce. The Onshore Transmission Station(s) Zone is primarily located in the Gwendraeth Fach, Crwbin Ridge and Middleton Hills, which have been given a Visual and Sensory 'moderate' evaluation. It is also and partially in LLansaint Coastal Hills to the east of the Onshore Transmission Station(s), which has a "high" Visual and Sensory evaluation (**Figure 3.6.4**).

3.6.2.6 National Landscape Designations

1258. The LVIA Study area includes parts of the PCNP, which covers the majority of the western coastline in the Study Area (**Figure 3.6.2**). See **Section 2.11 SLVIA** for further information on the PCNP.
1259. The LVIA Study Area lies close to the Gower National Landscape (formerly Area of Outstanding Natural Beauty (AONB)) (**Figure 3.6.2**). This coastal designated landscape lies close to the eastern boundary of the Study Area). See **Section 2.11 SLVIA** for further information on the Gower National Landscape.
1260. The LVIA would provide an assessment of the effects of the onshore infrastructure located outside the PCNP and Gower National Landscape against the special qualities experienced in the PCNP and Gower National Landscape, including an assessment of the relevant planning policy tests and / or statutory duties applicable to these designated landscapes.

3.6.2.7 Local Planning Designations

1261. CCC has identified the Carmarthenshire Bay and Estuary as an SLA (**Figure 3.6.2**). SLAs represent a non-statutory designation reflecting the LANDMAP aspect areas classified as 'outstanding' and supported where appropriate by those classified as 'high'. The Carmarthenshire Bay and Estuary SLA encompass the estuaries of the Rivers Loughor, Taf, Tywi and the Gwendraeth which are all in the Study Area. SLAs would be mapped in the LVIA and the associated value of the landscape in these areas would be considered in the assessment of sensitivity. The LANDMAP visual and sensory landscape evaluation categories would also be considered.
1262. There is an area of Heritage Coast (south Pembrokeshire) covering the western most edge of the coastline in the Onshore Scoping Boundary, which is coincident with part of the PCNP. Similarly, an area of Heritage Coast (Gower) is also coincident with the coastal parts of the Gower National Landscape close to the eastern most edge of the Study Area.
1263. There are 16 HPG as registered by Cadw, within the Study Area. These include (west to east) Stackpole Court, 111 Main street Pembroke, Lamphey Bishop's Palace and Lamphey Court, Upton Castle, Coshaston Hall, Cresselly, Merrixton House Farm, Kilgetty, Colby Lodge, Molleston Baptist Chapel, Blackaldern, Llanmiloe House, Laugharne Castle and Castle House, Llechdwnni and Bishop's Palace. The LVIA would undertake an assessment of the visual effects on the HPG only where access to the public is provided. The Cultural Heritage assessment in the EIA would consider the effects on the historic and cultural aspects of the HPG properties and their settings.



- Legend:
- Onshore Scoping Boundary
 - Offshore Scoping Boundary
 - Onshore LVIA Study Area
 - National Park
 - National Landscapes
 - Special Landscape Area
 - Parks & Gardens
 - Heritage Coast

Source: © Haskoning UK Ltd, 2026
 Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
 © Crown copyright and database rights (2026) Ordnance Survey AC0000808122.
 Contains public sector information licensed under the Open Government Licence v3.0.
 Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights reserved.
 © Crown copyright (Cadw), 2026

Project: Gwynt Glas Offshore Wind Farm Scoping Report

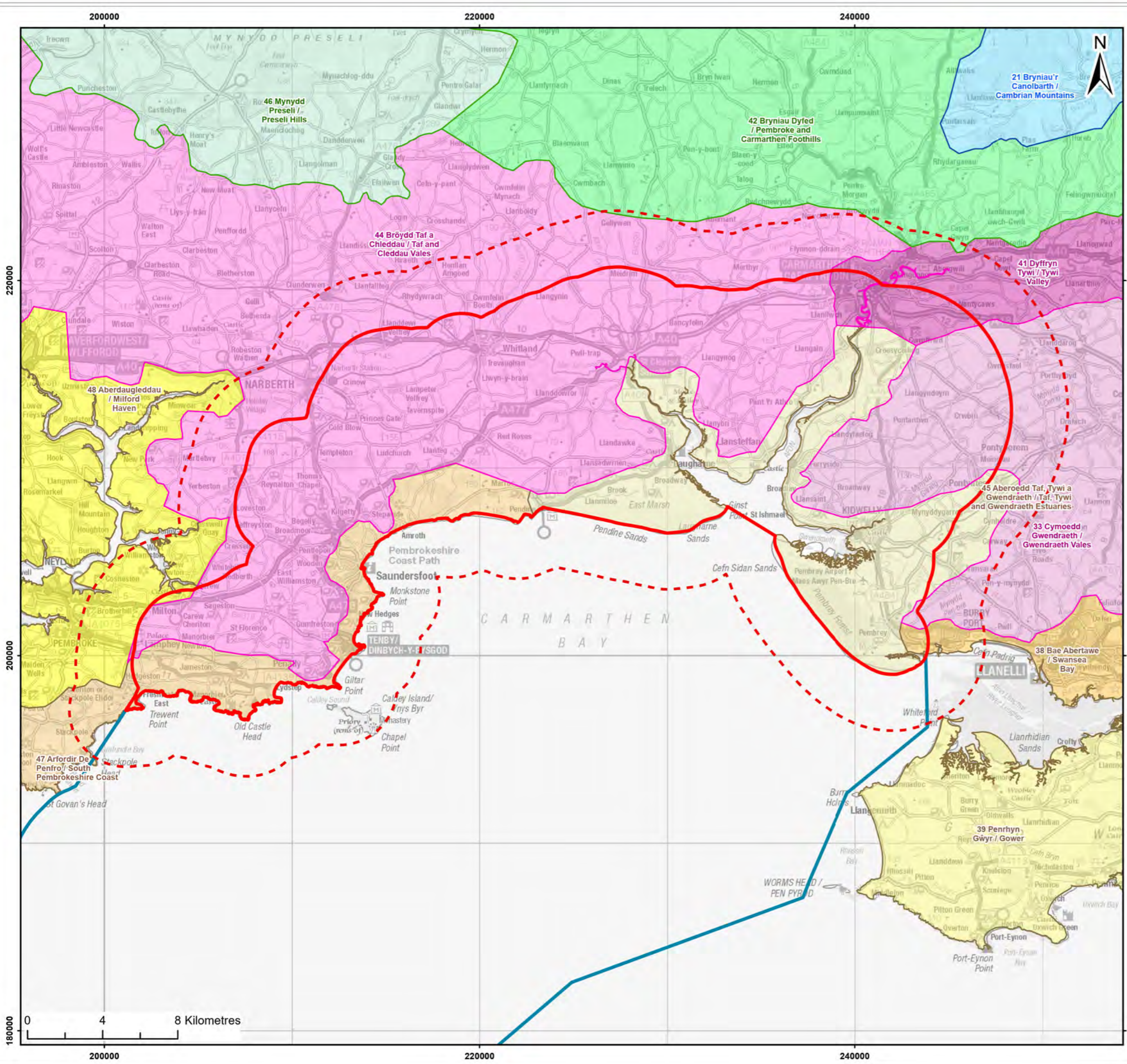
Title: Landscape Designations

Figure: 3.6.2 Drawing No: PC6850-HAS-ZZ-ZZ-DR-GS-0001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/03/2026	BL	NJ	A3	1:200,000
02	25/03/2026	RH	NJ	A3	1:200,000
03	06/05/2026	BL	NJ	A3	1:200,000

Co-ordinate system: OSGB 1936 British National Grid





Legend:

- Onshore Scoping Boundary
- Offshore Scoping Boundary
- Onshore LVIA Study Area

Landscape Character Areas

- Gower
- Milford Haven
- South Pembrokeshire Coast
- Swansea Bay
- Taf, Tywi and Gwendraeth Estuaries

Valleys and Vales

- Gwendraeth Vales
- Taf and Cleddau Vales
- Tywi Valley

Foothills and Hills

- Pembroke and Carmarthen Foothills
- Preseli Hills

Mountains

- Cambrian Mountains

Source: © Haskoning UK Ltd, 2026
 Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
 © Crown copyright and database rights (2026) Ordnance Survey AC0000808122.
 Contains public sector information licensed under the Open Government Licence v3.0.
 Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights reserved.

Project:
 Gwynt Glas Offshore Wind Farm Scoping Report

Title:
 National Landscape Character

Figure: 3.6.3 Drawing No: PC6850-HAS-ZZ-ZZ-DR-GS-0001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/03/2026	BL	NJ	A3	1:200,000
02	25/03/2026	RH	NJ	A3	1:200,000
03	06/05/2026	BL	NJ	A3	1:200,000

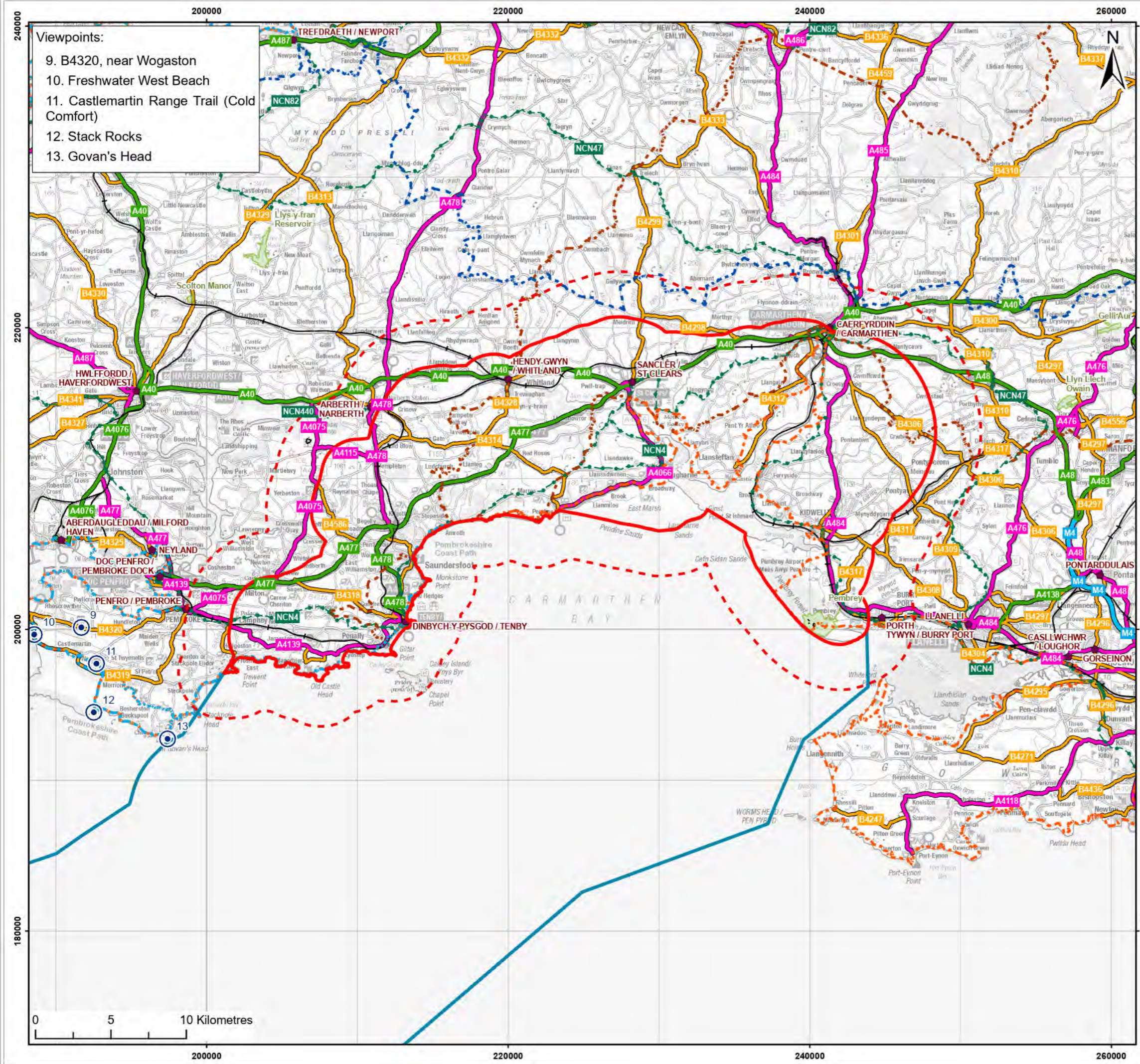
Co-ordinate system: OSGB 1936 British National Grid



Haskoning
Enhancing Society Together



Gwynt GLAS



- Viewpoints:
- 9. B4320, near Wogaston
 - 10. Freshwater West Beach
 - 11. Castlemartin Range Trail (Cold Comfort)
 - 12. Stack Rocks
 - 13. Govan's Head



Legend:

- Onshore Scoping Boundary
- Offshore Scoping Boundary
- Onshore LVIA Study Area
- Country Parks
- Initial Viewpoints
- Settlements (Large)
- Railway Track or Railway Tunnel
- National Cycle Route
- Long Distance Trails:
 - Pembrokeshire (Wales Coastal Path)
 - Wales Coastal Path
 - Celtic Way
 - Cistercian Way
- Motorway
- Primary Road
- A Road
- B Road

Source: © Haskoning UK Ltd, 2026
 Base map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
 © Crown copyright and database rights (2026) Ordnance Survey AC0000808122
 Contains public sector information licensed under the Open Government Licence v3.0.
 National Cycle Route data supplied by Sustrans contains Ordnance Survey data (© Crown copyright and database rights (2026)).
 Contains Natural Resources Wales information © Natural Resources Wales and Database Right. All rights reserved.

Project: Gwynt Glas Offshore Wind Farm Scoping Report

Title: Visual Receptors with Viewpoints

Figure: 3.6.5 Drawing No: PC6850-HAS-ZZ-ZZ-DR-GS-0001

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/03/2026	BL	NJ	A3	1:250,000
02	25/03/2026	RH	NJ	A3	1:250,000
03	06/05/2026	BL	NJ	A3	1:250,000

Co-ordinate system: OSGB 1936 British National Grid



3.6.3 Data Sources

1264. The data sources that would be used to inform the LVIA are presented in **Table 3.6.1**.
1265. Data to inform the LVIA would be collected using both desk-based study and analysis and field work in the LVIA Study Area. Photography would be used to prepare visualisations and inform impact assessment, using the visualisations as an aid to define landscape and visual effects.
1266. Baseline data would be used to define and describe the landscape and visual receptors that would be considered in the LVIA. Data would be gathered from official, reliable and up-to-date sources. These would include OS map-based data, as well as data on seascape and landscape characterisation, landscape designations and other Governmental and local authority data of relevance.

Table 3.6.1 Data Sources to Inform the LVIA

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
National Landscape Character of Wales	LVIA Study Area	2023 (last updated)
NRW LANDMAP	LVIA Study Area	2021
PCC Local Development Plan	LVIA Study Area	2013 (Adoption of new Local Plan scheduled for May 2026)
PCNP Local Development Plan 2	SLVIA Study Area	2020
CCC Local Development Plan	LVIA Study Area	2014
Swansea Council Local Development Plan	LVIA Study Area	2019
OS mapping and DTM(s)	LVIA Study Area	2022
Aerial and street-level photography available from Bluesky aerial survey	LVIA Study Area	Various

3.6.4 Approach to Impact Assessment

3.6.4.1 Guidance

1267. The approach to impact assessment would be based on the 'Guidelines for LVIA Third Edition' ('GLVIA3') (including 2024 clarifications), the key source of guidance for LVIA. Other sources of guidance that would be used and referenced in the LVIA include the following:
- Design Commission for Wales (2023). Designing for Renewable Energy in Wales;

- Landscape Institute (2019a). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19;
- Landscape Institute (2019b). Technical Guidance Note 2/19 Residential Visual Amenity Assessment;
- Landscape Institute (2021). Technical Guidance Note 2/21 Assessing landscape value outside of national designations;
- NE (2018). An Approach to Landscape Character Assessment;
- NRW (2021b) GN46: Guidance for Wales, Using LANDMAP in LVIA(S);
- NRW (no date (a)). LANDMAP the Welsh landscape baseline; and
- NatureScot (2025). Guidance for Assessing the Effects on Special Landscape Qualities.

3.6.4.2 Overview

1268. The methodology used in the LVIA would reflect the ‘Guidelines for LVIA Third Edition’ (Landscape Institute and IEMA, 2013), which constitutes best practice guidance for LVIA. In accordance with this and with the EIA Regulations, the effects arising from the onshore infrastructure on the landscape and visual resource would be assessed as either significant or not significant.

1269. The approach to the LVIA is summarised as follows:

- Those features of the onshore transmission infrastructure that may result in landscape and visual effects would be described and a Maximum Design Scenario would be defined to represent the basis for assessment of the onshore transmission infrastructure;
- The overall scope of the LVIA would be defined, including the study area and range of possible landscape and visual effects;
- The landscape baseline would be established, using landscape character assessment and the ZTV of the onshore transmission infrastructure to identify landscape receptors that may be affected and their key characteristics and value;
- The visual baseline would be established by defining the ZTV, identifying the people who may be affected and identifying visual receptors and selecting representative viewpoints;
- A preliminary assessment would be undertaken with reference to ZTVs and wirelines, in order to identify landscape and visual receptors with the potential to be significantly affected by the onshore transmission infrastructure, which would then be subject to detailed assessment. Those receptors which are considered unlikely to experience significant effects would not be subject to the detailed assessment;
- Assessments of the sensitivity of each receptor, and the magnitude of change experienced, would be carried out. Judgements of the susceptibility of each receptor to change of the type proposed would be combined with judgements of the value of the receptor to determine the sensitivity of receptors to the onshore transmission infrastructure.
- An assessment of the size and scale of landscape impact, the degree to which landscape elements are altered and the extent to which the impacts change the key characteristics of the landscape would be undertaken, combining these judgements to assess the magnitude of change on each landscape receptor.

- An assessment of the size and scale of visual impact, the extent to which the change would affect views, whether this is unique or representative of a wider area, and the position of the onshore transmission infrastructure in relation to the principal orientation of the view and activity of the receptor would be undertaken. These judgements are combined to assess the magnitude of change on the visual receptor.
- The judgements relating to sensitivity and magnitude of change would then be combined to determine the significance of each seascape, landscape or visual effect. In accordance with GLVIA3 (Landscape Institute, 2013), professional judgement would be applied in the determination of significant effects, but in general, the higher the sensitivity and higher the magnitude of change, the more likely that a significant effect would arise as a result of the onshore transmission infrastructure; and
- Primary mitigation would be defined and included as an inherent part of the Development design, if required, to avoid, prevent, reduce or offset significance adverse effects through an iterative process. Secondary mitigation to avoid, prevent, reduce or offset significance adverse effects to achieve the anticipated outcomes described within the LVIA, which are likely to be secured through mitigation plans such as the Outline Landscape and Ecological Mitigation Plan and Transmission Station Design Principles Document (Design Guide).

3.6.4.3 Assessment of Impacts

1270. The methodology for the assessment of impacts would be as outlined in **Section 1.8 EIA Methodology** and the above guidance in **Section 3.6.4.1**.
1271. For the purposes of the assessment, any effects with a significance level of Major and Major-Moderate are deemed significant in EIA terms. Moderate levels of effect have the potential, subject to the assessor's professional judgement, to be considered as significant or not significant, depending on the sensitivity and magnitude of change factors evaluated. GLVIA3 clarification note 3(5) supports this approach and states that "moderate effects may or may not be significant and justification would be needed in the methodology or receptor assessment as to whether a moderate effect is significant or not." The assessments of significance for Moderate levels of effect would therefore be explained as part of the assessment, where they occur.
1272. The 'nature of effects' arising from the onshore transmission infrastructure relates to whether the effects of the proposed Development are adverse, neutral, or beneficial. Guidance provided in GLVIA3 states that "*thought must be given to whether the likely significant landscape and visual effects are judged to be positive (beneficial) or negative (adverse) in their consequences for landscape or for views and visual amenity*" but does not provide an indication as to how that may be established in practice. The nature of effect is therefore one that requires interpretation and reasoned professional opinion. A precautionary approach would be adopted which assumes that significant landscape and visual effects would be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations.

3.6.4.4 Visual Receptors

1273. The visual assessment would determine the degree of anticipated change to visual amenity experienced by people (visual receptors) that would occur as a result of the onshore infrastructure. The visual assessment considers static and sequential effects through analysis of visual receptors and individual viewpoints, considered representative of the range of views within the LVIA Study Area.

1274. An analysis of visual receptors has been carried out within this Scoping Report based on a good working knowledge of the LVIA study area, and desk study and use of GIS. To inform the LVIA, field surveys will also be undertaken throughout the LVIA Study Area. The field survey work will include visits to viewpoints as well as travel around the LVIA study area to consider potential effects on the experience of views seen from static receptors and routes through the landscape.
1275. Visual receptors have been identified within the LVIA Study as shown on **Figure 3.6.5**. A ZTV analysis would be undertaken to understand the main area in which the Development would theoretically be visible, highlighting the different groups of people who may experience views of the Onshore Transmission Station(s), Landfall and Onshore Export Cable Corridor within the Onshore Scoping Boundary and inform the identification of viewpoints where they may be affected.
1276. The LVIA would assess the Development Design Envelope which has the maximum effect on landscape and visual receptors, and this would be agreed with relevant consultees.
1277. The ZTV would be overlaid on OS mapping to show that the main areas of theoretical visibility of the onshore transmission infrastructure. Visual receptors include people within settlements, driving on roads, visitors to tourist facilities or historic environment assets and people engaged in recreational activity such as those using walking and cycle routes as well as coast and beach users.
1278. A detailed assessment would be undertaken in the LVIA for those visual receptors that are most susceptible to changes, which may experience significant visual effects as a result of the onshore transmission infrastructure. The predicted visibility of the onshore transmission infrastructure would be reviewed in the field, and it is expected that there is likely to be localised screening by intervening vegetation and built form.
1279. Visual receptors that have potential to experience views of either the construction, decommissioning or operation (including maintenance) of the onshore transmission infrastructure are identified in the preliminary visual receptor list shown in **Table 3.6.2** below. These visual receptors represent the range of visual receptors within the LVIA study area, based on desk review of the landscape and visual resource within the Onshore Scoping Boundary. These visual receptors include:

Table 3.6.2 Relevant Landscape and Visual Receptors within the LVIA Study Area

RECEPTOR	RECEPTOR TYPES / DESCRIPTION
Landscape Designations	National designations such as PCNP and Gower National Landscape. Regional and Local designations such as the Carmarthenshire Bay and Estuary SLA, south Pembrokeshire Heritage Coast, Gower Heritage Coast and 16 HPG.
LCAs	NLCA such as south Pembrokeshire Coast, Milford Haven, Taf and Cleddau Vales, Taf, Tywi and Gwendraeth Estuaries, Gwendraeth Vales, Swansea Bay, Gower and Tywi Valley.

RECEPTOR	RECEPTOR TYPES / DESCRIPTION
	Regional and Local Character Areas such as Penally, Hundleton and Lamphey, Jeffreyton Lowlands and Narbeth and Lampeter Vale (PCC Landscape Character Assessment, Consultation Draft, July 2019); Whiteford, Loughor Estuary (Gower Landscape Character Assessment, City and County of Swansea, March 2013); and LANDMAP Aspect Areas.
Settlements	Coastal settlements such as Saundersfoot, Pendine, Llanmiloe, Kidwelly, Pembrey and Burry Port. Numerous small villages within the Onshore Transmission Station(s) Zone and settlements in the wider Onshore Transmission Station(s) LVIA Study Area, such as Carmarthen, Meinciau, Pontyberem, Pontyates, Mynyddygarreg and Ferryside.
Key Transport Routes	Primary roads near the coast such as the A477. 'A' roads near the coast such as the A484 and A4066. Primary roads passing through the Onshore Transmission Station(s) LVIA Study Area such as the A48; together with 'A' roads such as the A484 and 'B' Roads such as the B4306, B4309 and B4312.
Recreational routes	Several important recreational routes such as the Pembrokeshire Coast Path along the coastline of the PCNP. The Wales Coast Path and NCN4 along the coastline of the LVIA Study Area and extending inland towards Carmarthen through the Onshore Transmission Station(s) Zone. The Cistercian Way through the Onshore Transmission Station(s) LVIA Study Area.
Tourist Facilities	Several tourist related facilities, particularly those close to coastline such as camp sites, caravan parks and other accommodation providers as well as Country Parks (such as Pembrey Country Park), Pembrey Forest and the beaches at Pembrey, Pendine Sands, Marros Sands, Amroth and Saundersfoot.

3.6.4.5 Viewpoints

1280. The visual assessment would be based on a series of viewpoints representing the visual receptors (**Table 3.6.2**) within the ZTV. Due to uncertainties regarding the location of the onshore transmission infrastructure, potential viewpoints cannot be defined in this Scoping Report. It is anticipated however, that viewpoints for the LVIA would be identified and refined further during the EIA, following confirmation of the location of the Landfall, Onshore Export Cable Corridor and Onshore Transmission Station(s). Potential viewpoints would be chosen to provide a representative cross section of receptor types and locations in the LVIA Study Area, focused on those with the potential for likely significant effects within the ZTV. A final list of viewpoints for the LVIA would be agreed in consultation with stakeholders. Viewpoint photography would be taken during winter and summer months during 2026 / 2027 prior to the submission of the ES. These would be undertaken at the agreed viewpoints to illustrate existing views showing the baseline conditions within the LVIA Study Area.

3.6.5 Potential Impacts

1281. The purpose of the LVIA is to identify and record the potential impacts and effects that the proposed Development may have on physical elements of the landscape; landscape character; areas that have been designated for their scenic or landscape-related qualities; and views from various locations such as settlements, travel routes, hilltops, and other sensitive locations. The potential cumulative effects that may arise from the incremental effects of the proposed Development with other planned renewable energy developments is also considered.

3.6.5.1 Potential Impacts During the Construction Stage

1282. During construction the presence of construction activity and partially completed structures has the potential to locally impact designated landscapes, landscape character and visual receptors.

1283. Impacts on landscape and visual amenity arising from Landfall and Onshore Export Cable installation works would be short-term and localised. Established good practice measures would be applied to minimise disturbance and to ensure rapid reinstatement.

1284. Construction of the Onshore Transmission Station(s) would involve longer-term disturbance due to the greater complexity and scale of works anticipated.

1285. Potential impacts during the construction stage would be caused by the following activities:

- GI and pre-construction surveys;
- Road / junction modifications and any new junctions off existing highways if required as well as temporary haul roads;
- Pre-construction utilities diversions;
- Site clearance;
- Creation of temporary construction compounds;
- Onshore vehicle movements from infrastructure parts deliveries as well as personnel vehicle movements; and
- Excavations and construction of infrastructure such as the Onshore Transmission Station(s).

1286. As a result of the above, the following construction related impacts would be **scoped in** to the EIA.

- Potential physical effects on existing landscape elements of the Landfall, Onshore Export Cable Corridor;
- Potential impact on landscape character resulting from the Landfall and Onshore Export Cable Corridor;
- Potential physical effects on existing landscape elements of the Onshore Transmission Station(s);
- Potential impact on landscape character resulting from the Onshore Transmission Station(s);
- Potential impact on the special qualities of landscape designations resulting from the Landfall and Onshore Export Cable Corridor;
- Potential impact on the special qualities of landscape designations resulting from the Onshore Transmission Station(s);

- Potential impact on views experienced by visual receptors resulting from the Landfall and Onshore Export Cable Corridor; and
- Potential impact on views experienced by visual receptors resulting from the Onshore Transmission Station(s).

3.6.5.2 Potential Impacts During the O&M Stage

1287. Following installation and restoration of ground, below ground Onshore Export Cables would not significantly impact landscape or visual receptors. Operational impacts resulting from the Landfall and Onshore Export Cable are therefore **scoped out** of the LVIA.
1288. The potential for the operation of the Onshore Transmission Station(s) to significantly impact designated landscapes, landscape character and visual amenity varies dependent on their location and design. Onshore Transmission Station(s) are likely to be relatively large structures and therefore LVIAs associated with construction and operation of the Onshore Transmission Station(s) are **scoped in** to the LVIA.
1289. Potential impacts during the O&M would result in the following impacts to be **scoped in** to the EIA:
- Potential physical effects on existing landscape elements of the Landfall, Onshore Export Cable Corridor and Onshore Transmission Station(s);
 - Potential impact on landscape character resulting from the Onshore Transmission Station(s);
 - Potential impact on the special qualities of landscape designations resulting from the Onshore Transmission Station(s); and
 - Potential impact on views experienced by visual receptors resulting from the Onshore Transmission Station(s).

3.6.5.3 Potential Impacts During the Decommissioning Stage

1290. Impacts during the decommissioning stage are expected to be similar in nature to those anticipated during construction, but of smaller magnitude. The same potential impacts noted for construction are therefore expected to be **scoped in** for decommissioning.

3.6.5.4 Potential Inter-relationship Impacts

1291. The impact assessment would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts on landscape and visual assets are **scoped in** to the EIA.

3.6.5.5 Potential Cumulative Impacts

1292. There is potential for cumulative impacts to arise in relation to the onshore transmission infrastructure, with other similar types of projects such as substations or energy developments. This includes the proposed Llandyfaelog Substation to be built by National Grid. The Onshore Transmission Station(s) Zone is already a focus for grid infrastructure including existing overhead power lines and battery storage. The potential for other projects to give rise to cumulative effects has therefore been **scoped in** to the LVIA. The final list of projects to be considered within the

detailed cumulative assessment would be determined during the LVIA, taking account of changes to the cumulative situation and would take account of consultation feedback from key consultees.

3.6.5.6 Summary of Impacts

1293. **Table 3.6.3** outlines the impacts which are proposed to be **scoped in** to and / or **out** of the EIA. This may be refined as additional information and data becomes available.

Table 3.6.3 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) of the LVIA

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Potential physical effects on existing landscape elements of the Landfall, Onshore Export Cable Corridor	✓	x	✓
Potential impact on landscape character resulting from the Landfall and Onshore Export Cable Corridor	✓	x	✓
Potential physical effects on existing landscape elements of the Onshore Transmission Station(s)	✓	✓	✓
Potential impact on landscape character resulting from the Onshore Transmission Station(s)	✓	✓	✓
Potential impact on the special qualities of landscape designations resulting from the Landfall and Onshore Export Cable Corridor	✓	x	✓
Potential impact on the special qualities of landscape designations resulting from the Onshore Transmission Station(s)	✓	✓	✓
Potential impact on views experienced by visual receptors resulting from the Landfall and Onshore Export Cable Corridor	✓	x	✓
Potential impact on views experienced by visual receptors resulting from the Onshore Transmission Station(s)	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓

3.6.6 Potential Mitigation Measures

- 1294. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.
- 1295. A number of embedded mitigation measures relevant to the LVIA, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
- 1296. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to LVIA impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**. The assessment of impacts would be made with these embedded mitigation measures in place.
- 1297. Requirements for any additional mitigation measures would be determined through the EIA.
- 1298. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

3.7 Traffic and Transport

1299. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Traffic and Transport.

1300. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Traffic and Transport receptors in the Development's ES.

1301. The Traffic and Transport assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:

- **Section 1.5 Project Description;**
- **Section 3.8 Noise and Vibration;**
- **Section 3.9 Air Quality;**
- **Section 4.1 Population and Human Health;**
- **Section 4.2 Socio-economics;** and
- **Section 4.3 Tourism and Recreation.**

The following questions are posed to consultees to help them frame and focus their response to the Traffic and Transport scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Traffic and Transport Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the initial characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on Traffic and Transport resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

3.7.1 Study Area

1302. The following section provides a review of the existing environment in relation to an initial Traffic and Transport Study Area, located in south-west Wales, surrounding Carmarthen Bay. For the purposes of scoping, it is assumed that impacts to Traffic and Transport would occur wholly within

the Onshore Scoping Boundary. Further refinement of the Traffic and Transport Study Area would be undertaken once the location of the Landfall, Onshore Cable Corridor and Onshore Transmission Station(s) (collectively referred to as the Onshore Development Area) are identified, and traffic demand is more defined. Paragraph 1333 includes details of the approach that would be adopted to refine the Traffic and Transport Study Area.

1303. The initial Traffic and Transport Study Area is shown on **Figure 3.7.1**. The Traffic and Transport Study Area encompasses the administration of two local highway authorities (CCC and PCC) and the Welsh Government who are responsible for the management of the Strategic Road Network, herein collectively referred to as the highway authorities.

3.7.2 Baseline Environment

3.7.2.1 Road Network

1304. At this scoping stage, no decision has been made with regard to the final location of the Onshore Development area (and associated access locations). As such, an initial high-level Traffic and Transport Study Area has been established, based on the Onshore Scoping Boundary, and is depicted on **Figure 3.7.1**, which extends from the town of Carmarthen in the north-east, towards Tenby and Penally in the south-west.
1305. The A40 and the A48 provide the main roads connecting the Traffic and Transport Study Area to the wider highway network. The A40 / A48 forms part of the Strategic Road Network managed by the Welsh Government and the south Wales Trunk Road Agent and provides the main link between Fishguard and Haverfordwest to the west and the M4 corridor to the east, via the A48, providing connections to Cardiff and England.
1306. Within the Traffic and Transport Study Area, the A40 comprises of a dual carriageway between Carmarthen and Saint Clears. This section of the A40 carries in the region of 43,500 vehicles per day, of which approximately 4.6% are HGVs (Department for Transport (DfT), 2024). To the west of the junction with Saint Clears, the A40 continues towards Haverfordwest as a single carriageway. There is however a small section between the Pemblewin Roundabout and Llanddewi Velfrey, where two lanes are provided in one direction and one lane in the other allowing for safe overtaking (with the two-lane section alternating sides). These sections of the A40 carry in the region of 12,000 vehicles per day, of which approximately 7.3% are HGVs.
1307. Other strategic roads within the study area include the following:
- The A477 provides the main link to Pembroke Dock and carries in the region of 9,500 vehicles per day (approximately 6.3% are HGVs);
 - Llanelli is accessed by the A484, which runs south from Carmarthen. The road carries in the region of 5,000 vehicles per day (approximately 2.2% are HGVs);
 - The main route between Tenby and Pembroke is the A4139. The road carries in the region of 4,000 vehicles per day (approximately 1.4% are HGVs);
 - The A4066 to Pendine carries in the region of 2,200 vehicles per day (approximately 5.2% are HGVs);
 - The A478 between Kilgetty and Tenby carries in the region of 7,600 vehicles per day (approximately 3.1% are HGVs); and
 - A48 to the M4 provides a main route to Swansea, Cardiff and southern England. The road carries in the region of 37,500 vehicles per day (approximately 5% are HGVs).
1308. It is recognised that traffic flows within the Traffic and Transport Study Area are subject to seasonal variation, particularly associated with tourism activity and holiday periods, which is a characteristic of the wider south-west Wales highway network. At this scoping stage, baseline conditions have been characterised using annual average daily traffic data to provide a consistent and proportionate overview of existing conditions.
1309. The potential influence of seasonal variation on Traffic and Transport effects would be considered further as the assessment progresses, informed by consultation with the relevant highway

authorities and stakeholders, once the nature, timing and routeing of construction traffic is better understood.

- 1310. The Carmarthenshire Local Development Plan highlights the importance of the connections to the ports via the A40, A477 and A48 and the connection with the Trans-European Network.
- 1311. A Transport Background Paper released to support the Revised Carmarthenshire Local Development Plan (which is currently being developed) describes several schemes that the area would benefit from, particularly the improvements of several junctions and roundabouts.
- 1312. The PCC Local Development Plan identifies the need for significant investment in Transport infrastructure, including dualling the A40 and improving the A477.

3.7.2.2 Walking, Cycling and Equestrian Routes

- 1313. Within the Traffic and Transport Study Area there is an extensive network of walking routes and PRoW, including bridleways, in the towns and villages. The Wales Coast Path, consisting of the Pembrokeshire and Carmarthen Bay and Gower sections, are located to along the coast, with a section connecting to Carmarthen via the River Towy. In addition, NCR 4 runs along the south Wales coast via Carmarthen, and NCR 47 runs from Fishguard to Llanelli (also via Carmarthen).
- 1314. Further evaluation of the baseline walking and cycling routes would be undertaken once the final location of the Onshore Development Area (and associated access locations) is finalised.

3.7.2.3 Rail and Sea

- 1315. The West Wales Line runs through the Traffic and Transport Study Area, connecting to the south-western coast from Swansea. A number of smaller stations are located on this line, with the largest being Carmarthen (which has services terminating at London and Manchester).
- 1316. Freight trains run on the West Wales line to the east and west of the study area, connecting to Milford Haven, Fishguard, Swansea and further afield.

3.7.3 Data Sources

- 1317. **Table 3.7.1** outlines existing primary data that has been used to inform the characterisation of the baseline environment in relation to an initial Traffic and Transport Study Area (outlined in **Section 3.7.1**). These data sources use the most recently available data at the time of drafting.
- 1318. The data sources outlined in **Table 3.7.1** would also be used to inform the EIA.

Table 3.7.1 Data Sources to Inform the Traffic and Transport Assessment

DATASET	SPATIAL COVERAGE
DfT road traffic statistics (GOV.UK, 2024)	Annual average traffic counts for all main 'A' roads and some local roads
Online mapping, e.g. Google Maps, Bing Maps, etc.	Online mapping for all roads, rail and PRoW links within the refined Traffic and Transport Study Area
Sustrans (Walk Wheel Cycle Trust, 2026)	Details of NCRs within the Traffic and Transport Study Area

DATASET	SPATIAL COVERAGE
Bus operator’s websites e.g. First Bus (2026)	Details of bus routes for all roads within the Traffic and Transport Study Area
Train operator’s websites e.g. Transport for Wales (2026)	Details of all train services within the Traffic and Transport Study Area
Collision Data (Crashmap, 2020)	Data detailing the type and location of all injury collisions would be captured from the highway authorities for all roads within the refined Traffic and Transport Study Area for the latest five year period available.

1319. In addition to the data sources in **Table 3.7.1**, **Table 3.7.2** describes the types of data and surveys that will be collated to support the assessment (once the delivery routes have been identified). Survey methodologies and locations will be agreed in advance with the highway authorities.

Table 3.7.2 Site-Specific Survey Data

DATA SET	SPATIAL COVERAGE	SURVEY TIMINGS	DESCRIPTION OF SURVEYS
Baseline Daily and Hourly Traffic Flow Data	All roads within the refined Traffic and Transport Study Area	Surveys anticipated to be undertaken in 2027 Most recent available data (for neutral periods, e.g. avoiding school holidays)	The surveys will capture details of daily and hourly traffic flows (including vehicle composition) for a period of at least seven days. The surveys will also record vehicle speeds.
Turning Count Data	Selected sensitive junctions within the Traffic and Transport Study Area	Surveys anticipated to be undertaken in 2027 Most recent available data (for neutral periods, e.g. avoiding school holidays)	The surveys will capture vehicle turning counts (including composition) for peak hours. Once delivery routes and likely hourly flows have been established, the locations would be agreed with the highway authorities.

1320. Consideration would also be given at EIA stage to whether seasonal factors are relevant to the assessment of specific impacts. The scope and approach to any such consideration, including the need for seasonal surveys to be agreed with the highway authorities following scoping.

3.7.4 Approach to Impact Assessment

3.7.4.1 Guidance

1321. The principal guidelines for the assessment of the environmental impacts of road traffic associated with new developments are the ‘Environmental Assessment of Traffic and Movement (EATM)’ (Davis *et al.*, 2023) published by the IEMA (now known as the ISEP).

1322. The EATM guidance provides a framework for the assessment of traffic borne environmental impacts and would be supplemented by the technical Transport guidance outlined in **Table 3.7.3**.

Table 3.7.3 Supplementary Technical Transport Guidance

DOCUMENT	PURPOSE / APPLICATION
Welsh Government PPW Edition 12 (Welsh Government, 2024)	Provides overarching guidance upon the structure of Transport assessments and travel plans.
DMRB CD 123 - Geometric design of at-grade priority and signal - controlled junctions (National Highways, 2021)	Provides the standards for the design of new points of access where recorded speeds are more than 37mph.
Manual for Streets (DfT, 2007)	Guidance to inform the visibility requirements for junctions where measured speeds are below 37mph.
Manual for Streets 2 (Chartered Institute of Highways and Transportation, 2010)	
Traffic Signs Manual Chapter 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations Part 1: Design (DfT, 2009)	Provides guidance on temporary traffic management that would be used to inform the assessment of driver delay impacts related to temporary traffic management and road closures.

3.7.4.2 Impact Assessment Thresholds and Process

1323. EATM suggests application of the following rules to define the extent and scale of the assessment required:

- Rule 1: Include highway links where traffic flows would increase by more than 30% (or where the number of HGVs would increase by more than 30%); and
- Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more.

1324. In justifying these rules EATM examines the science of traffic forecasting and states:

“Traffic forecasting is not an exact science, and the accuracy of projections is open to debate. It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day-to-day variation of traffic on a road is frequently at least + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact.”

1325. Therefore, changes in traffic flows below the EATM Rules (thresholds) are assumed to result in no discernible or negligible environmental effects and therefore would not be assessed further as part of the assessment.

1326. EATM, however, notes that the Rule 1 and Rule 2 ‘criteria’ process may not be appropriate for some impacts, and it is generally accepted by regulators and practitioners that it should not be applied to assessments of road safety and driver delay. These impacts can be potentially significant for lower changes in traffic flow when high baseline traffic flows are evident. Full details of the methodology adopted for these impacts are set out later in this section.

1327. Following initial screening, EATM, sets out considerations and, in some cases, thresholds in respect of changes in the volume and composition of traffic to facilitate a subjective judgement of traffic effect and significance.
1328. While the assessment methodology is based on neutral traffic conditions in accordance with established industry guidance, it is acknowledged that certain receptors and highway links within the study area experience variations in traffic demand at different times of the year. The relevance of seasonal variation to the assessment of specific impacts would be reviewed at EIA stage, where necessary, to ensure a proportionate and robust assessment.

3.7.4.3 Identification of Sensitive Receptors

1329. The sensitivity of a road can be defined by the type of user groups who may use it. EATM identifies that it is necessary to identify particular groups ('receptors') and associated locations, which may be sensitive to changes in Traffic and Transport conditions and provides a checklist of sensitive locations and groups. However, the list is not exhaustive and can be added to by the assessor.
1330. Applying the EATM principles, **Table 3.7.4** provides broad definitions of the different sensitivity levels that would be adopted for the assessment.

Table 3.7.4 Example Definitions of the Different Sensitivity Levels

SENSITIVITY	PEDESTRIAN SEVERANCE AND DELAY, AMENITY AND FEAR AND INTIMIDATION	ROAD SAFETY	DRIVER DELAY (CAPACITY)	DRIVER DELAY (HIGHWAY CONSTRAINTS)	DRIVER DELAY (ROAD CLOSURES)
High	High concentrations of sensitive receptors (e.g. hospitals, schools, residential areas with high footfall) and limited separation provided by the highway environment; or a low concentration of sensitive receptors and no separation from traffic provided by the highway environment.	Links with collision rates above national averages and / or collisions clusters with emerging patterns of collisions.	Junctions operating at or over capacity.	Roads less than 5.5m wide with no passing places provided.	Informed by judgement upon levels of existing traffic (including scheduled bus services) and availability of alternative diversion routes.
Medium	A low concentration of sensitive receptors (e.g. residential dwellings, pedestrian desire lines, etc.) and some separation from traffic provided by the highway environment.	Links with collision rates close to national averages and / or collision clusters.	Junctions or links operating close to capacity.	Roads less than 5.5m wide but with passing places provided.	

Gwynt Glas Offshore Wind Farm Scoping Report

SENSITIVITY	PEDESTRIAN SEVERANCE AND DELAY, AMENITY AND FEAR AND INTIMIDATION	ROAD SAFETY	DRIVER DELAY (CAPACITY)	DRIVER DELAY (HIGHWAY CONSTRAINTS)	DRIVER DELAY (ROAD CLOSURES)
Low	Few sensitive receptors.	Links with collision rates lower than national averages and / or no collision clusters.	Junctions or links with spare capacity.	Roads in excess of 5.5m in width.	
Negligible	Links that fall below EATM Rule 1 and 2 screening thresholds and major 'A' roads or motorways with no pedestrian, cycle or equestrian environment; or a highway environment that can accommodate substantial changes in volumes of traffic.				

3.7.4.4 Impact Assessment Process

1331. The construction stage would result in a requirement for the import / export of materials, electrical equipment and plant. However, at this stage, no information is available for construction traffic demand. To derive this demand a 'first principles' approach would be adopted to calculate the likely traffic demand.
1332. The assumptions that would underpin the calculation of traffic demand would be developed with input from the Applicant's engineering team and augmented with experience gained through the construction of previous projects of a similar nature and scale. **Table 3.7.5** details the assessment parameters and the methodology to be used for construction traffic derivation.

Table 3.7.5 Construction Traffic Demand and Distribution

PARAMETER	METHODOLOGY
HGV Demand	Informed by forecast of likely material quantities aligned to a construction programme.
Employee Demand	Informed by a review of likely resourcing requirements.
HGV Distribution	Informed by a review of potential local supply chain, ports, quarries etc.
Construction Employee Distribution	Informed by socio-economics data for the availability of local labour and rented accommodation for non-local labour.

1333. The Development's traffic demand would be assigned to the highway links within the Traffic and Transport Study Area and the increase in traffic flow to baseline conditions determined. This would facilitate refinement of the Traffic and Transport Study Area and an assessment of the

magnitude of effect by applying the approach and thresholds described below and summarised in **Table 3.7.6** to inform a detailed evaluation of potential effects.

3.7.4.4.1 Pedestrian Severance and Delay, Amenity and Fear and Intimidation

1334. It is proposed to follow the methodology as prescribed within the EATM (summarised in **Table 3.7.6** utilising baseline traffic flows (as described in **Section 3.7.3**) to determine the magnitude of effect when applying the Development's forecast traffic demand.

3.7.4.4.2 Road Safety

1335. It is proposed to collect the latest full five years of collision data for all links within the study area. The collision data would be reviewed to establish areas with collision rates higher than national averages and / or concentration of collisions with similar patterns (termed collision clusters).

1336. EATM notes that some developments may involve the Transportation of dangerous or hazardous loads by road and that any traffic and movement assessment should clearly outline the estimated number and composition of such loads. Where the number of movements is considered to be significant, the assessment should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event.

1337. It is not envisaged that there would be a significant number of movements of hazardous loads and that such loads would likely comprise of fuel deliveries for plant during the construction stage. EATM notes that the extent of the risk analysis should reflect the nature of the product being distributed, noting that for instance, much more detail would be required for a scheme that involved the Transportation of nuclear products than for one that involved the delivery of petroleum.

1338. To present a proportionate assessment, it is proposed that rather than undertaking a discrete assessment of hazardous loads, the road safety assessment would include detailed analysis of the types of vehicles historically involved in collisions to understand if there are areas where vehicles Transporting hazardous loads may be at greater risk, i.e. where there is a pattern of collisions involving HGVs.

1339. Relevant mitigation measures (such as suitable potential alternative hazardous load routes if required) would be suggested to ensure the effects from hazardous loads would be managed and reduced to a minimum.

3.7.4.4.3 Driver Delay (Capacity)

1340. It is proposed that details of AM and PM construction and operational flows would be provided to highway stakeholders. These flows would aid further discussions with stakeholders to identify the likely impacts to network peak hours and the potential junctions requiring further assessment within the study area.

1341. It is proposed that all junctions with a predicted rise of 30 two-way peak hour movements per arm would be highlighted as a starting point for further discussions with the highway authorities regarding the need for detailed capacity assessments within the EIA.

3.7.4.4.4 Driver Delay (Highway Constraints)

1342. A review of local highway routes would be undertaken to establish highway geometry constraints (pinch points). To inform a judgement regarding the magnitude of effect, the assessment would consider the existing highway constraints (e.g. road width and availability of passing places) as well as the levels of baseline and proposed traffic. Potential mitigation measures could include passing places, junction widening, escorting vehicles and traffic marshals.

3.7.4.4.5 Driver Delay (Road Closures)

1343. Another category of highway constraint could include delays caused by road works where the onshore export cables cross the public highway. These crossings may require open cut methodology which would involve using traffic signals (single lane closure) or diversion routes (road closure). A review of the volume and type of road users would be examined to determine a sensitivity value. To inform a judgement regarding the magnitude of effect, the assessment would consider the required length and duration of a detour that may be needed to divert, or additional delay to vehicles waiting at traffic signals.

3.7.4.4.6 Abnormal Loads

1344. Abnormal load is a generic term that covers a broad range of vehicles, ranging from limited load projections permitted for standard vehicles to Special Order Vehicles designed specifically for the purpose of moving loads well in excess of standard vehicle parameters.

1345. Loads that require Special Type Vehicles are defined as Abnormal Indivisible Loads (AILs) in The Road Vehicles (Authorisation of Special Types) (General) Order 2003, which limits gross weight of an AIL to 150 tonnes, axle weight to 16,500kg, length to 30m and / or width to 6.1m. Above these limits a Special Order is required from National Highways (who manage approval on behalf of the SoS for Transport).

1346. The transformers for the Development’s Onshore Transmission Station(s) would require Special Order AILs. In addition, there may also be a requirement for non-Special Order abnormal loads associated with large items of plant, cable drums, etc.

1347. To ensure that potential impacts associated with the Transportation of all AILs are managed and coordinated, a commitment would be made in an Outline CTMP to be submitted at ES stage that, prior to the movement of any abnormal loads, the contractor would be required to submit notifications to the relevant authorities (police, highway authorities and bridge / structure owners) through the Electronic Service Delivery for Abnormal Loads (ESDAL). The ESDAL process would detail which proposed routes would be used and ensure the timings would be co-ordinated to ensure potential impacts would not be significant.

Table 3.7.6 Magnitude of Effect Thresholds

IMPACT	MAGNITUDE OF EFFECT			
	NEGLIGIBLE	LOW	MEDIUM	HIGH
Pedestrian Severance and Delay	Change in total daily traffic flow of less than 30%.	Change in total daily traffic flow of 30 to 60%.	Change in total daily traffic flow of 60 to 90%.	Change in total daily traffic flows of over 90%.

IMPACT	MAGNITUDE OF EFFECT			
	NEGLIGIBLE	LOW	MEDIUM	HIGH
Amenity	Change in daily traffic flow (or HGV component less than 100%).		Greater than 100% increase in daily traffic (or HGV component) and a review based upon the quantum of vehicles, vehicle speed and pedestrian footfall.	
Fear and Intimidation	No change in step changes between levels of fear and intimidation.	One step change in level of fear and intimidation, with ↗ <400 vehicle increase in average 18hr two-way all vehicle flows; and / or ↗ <500 HGV increases in total 18hr HGV flow.	One step change in level of fear and intimidation, with ↗ >400 vehicle increase in average 18hr two-way all vehicle flows; and / or ↗ >500 HGV increases in total 18hr HGV flows.	Two or more step changes in levels of fear and intimidation.
Road Safety	Informed by a review of existing collision records from within the Traffic and Transport Study Area and the forecast increase in traffic.			
Driver Delay (Capacity)	Junctions where peak hour flows <30 two-way movements per arm.	Informed by modelling of the potential increase in peak hour traffic through sensitive junctions.		
Driver Delay (Road Closures)	No full road closure required, or delays of less than two minutes.	Delays of two to ten minutes.	Delays over ten minutes and a review based upon the quantum of vehicles and scheduled buses.	
Driver Delay (Highway Constraints)	Informed by a review of the potential increase in peak hour traffic through links and pinch-points on the local highway network.			
Abnormal Loads	Informed by an assessment of the suitability of the access routes to accommodate abnormal loads.			

1348. The magnitude of effect (**Table 3.7.6**) would then be combined with the receptor sensitivity (**Table 3.7.4**) to determine the overall impact significance of the Development’s traffic in accordance with the assessment matrix (**Section 1.8 EIA Methodology**).

3.7.5 Potential Impacts

1349. The EATM provides the basis for consistent and comprehensive coverage of the traffic and movement impacts for a wide range of projects. These guidelines have been applied when determining potential impacts for the construction, operation and decommissioning stages.

3.7.5.1 Potential Impacts During the Construction Stage

1350. The construction stage would result in a requirement for the import / export of materials and plant as well as construction employees. However, at this stage, no information is available for construction traffic demand or intermodal delivery strategies. In order to consider a worst case, it would be assumed that the majority of construction traffic would be by road, albeit, potentially originating from one of the existing ports or rail freight facilities.

1351. The following sections set out the potential construction traffic impacts and the likely user groups that would be affected. These impacts are all **scoped in** to the EIA.

3.7.5.1.1 Pedestrian Severance and Delay, Amenity, and Fear and Intimidation

1352. Increases in construction traffic impacts non-motorised users of the public highway, including users of the PRoW network, NCRs and local cycling networks. This affects pedestrians, cyclists and equestrians.

3.7.5.1.2 Road Safety (including Hazardous Loads)

1353. Existing sites with a record of collisions can be affected by the increase in construction traffic. Additionally, the introduction of new risks associated with the formation of new construction accesses can impact road safety. This affects all road users.

3.7.5.1.3 Driver Delay (Capacity, Highway Constraints and Road Closures)

1354. An increase in traffic can increase driver delay, by impacting:

- Capacity, by increasing delays at junctions;
- Highway constraints, by construction traffic using narrow roads resulting in increased delays; and
- Road closures, by temporary closures of road / lane closures leading to delays due to diversions.

1355. These potential impacts affect all drivers and passengers in vehicles.

3.7.5.1.4 Abnormal Loads

1356. An increase in large vehicle movements can lead to delays to traffic and the suitability of the delivery routes to accommodate abnormal load deliveries. This would affect all road users.

3.7.5.2 Potential Impacts During the O&M Stage

1357. It is expected that the Onshore Transmission Station(s) would not be permanently manned, and staff would periodically visit to carry out routine checks and maintenance. Most annual maintenance would be short but, if necessary, some campaigns may be longer.

1358. Any inspections and maintenance of the Onshore Export Cables would be infrequent and subject to very low vehicle demand.
1359. Considering the activities above, no significant Traffic and Transport impacts are anticipated during the operational stage, and it is therefore proposed that this stage would be **scoped out** of the EIA.
- 3.7.5.3 Potential Impacts During the Decommissioning Stage
1360. Impacts during decommissioning are expected to be similar in nature to those anticipated during construction, but of smaller magnitude.
1361. The same potential impacts noted for construction are therefore expected to be **scoped in** (and **scoped out**) for decommissioning.
- 3.7.5.4 Potential Inter-relationship Impacts
1362. The EIA would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts are **scoped in** to the EIA.
- 3.7.5.5 Potential Cumulative Impacts
1363. Onshore cumulative impacts would be considered as part of the EIA process. Any other project with the potential to result in impacts that may act cumulatively with the Development would be identified. Consultation with the highway authorities would seek to identify any significant developments that could have a cumulative impact with the construction stage, e.g. major road improvement schemes, other NSIPs, etc.
1364. The assessment would consider the potential for significant cumulative impacts to arise because of the construction of the Development in the context of other developments that are existing, consented or at the application stage. It is therefore proposed that cumulative impacts are **scoped in** to the EIA for construction and decommissioning impacts but not O&M.
- 3.7.6 Summary of Potential Impacts
1365. **Table 3.7.7** outlines the impacts which are proposed to be **scoped in** to and / or **out** of the EIA. This may be refined as additional information and data becomes available.
1366. The scope of the Traffic and Transport assessment would remain under review as the Development design evolves, including consideration of whether seasonal traffic conditions are relevant to the assessment of any scoped-in impacts, informed by ongoing consultation with the highway authorities.

Table 3.7.7 Summary of Impacts Relating to Traffic and Transport to be Scoped In (✓) and Out (x) of the Traffic and Transport Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Pedestrian Severance and Delay	✓	x	✓
Amenity	✓	x	✓
Fear and Intimidation	✓	x	✓
Road safety (including consideration of hazardous loads)	✓	x	✓
Driver delay (capacity)	✓	x	✓
Driver delay (highway constraints)	✓	x	✓
Driver delay (road closures)	✓	x	✓
Abnormal loads	✓	x	✓
Inter-relationship Impacts	✓	x	✓
Cumulative Impacts	✓	x	✓

3.7.7 Potential Mitigation Measures

1367. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.
1368. A number of embedded mitigation measures relevant to the Traffic and Transport assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic would follow the mitigation hierarchy outlined in **Section 1.8 Methodology**.
1369. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to CCR impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.
1370. Requirements for any additional mitigation measures would be determined through the EIA and in discussion with the highway authorities or other relevant asset owners.
1371. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

3.8 Noise and Vibration

1372. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Noise and Vibration.
1373. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects of Noise and Vibration on onshore human sensitive receptors in the Development's ES. The potential Noise and Vibration impacts on ecological species and habitats which may be present would be assessed in **Section 2.3 Fish and Shellfish Section, 2.4 Marine Mammals and Marine Turtles** and **Section 3.1 Terrestrial Ecology and Onshore Ornithology** of the EIA, relevant to the identified receptor.
1374. The onshore Noise and Vibration assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:
- **Section 1.5 Project Description;**
 - **Section 3.5 Onshore Archaeology and Cultural Heritage;**
 - **Section 3.7 Traffic and Transport;**
 - **Section 3.9 Air Quality;**
 - **Section 4.1 Population and Human Health;**
 - **Section 4.2 Socio-economics; and**
 - **Section 4.3 Tourism and Recreation.**

The following questions are posed to consultees to help them frame and focus their response to the Noise and Vibration scoping exercise which would in turn inform the Scoping Opinion:

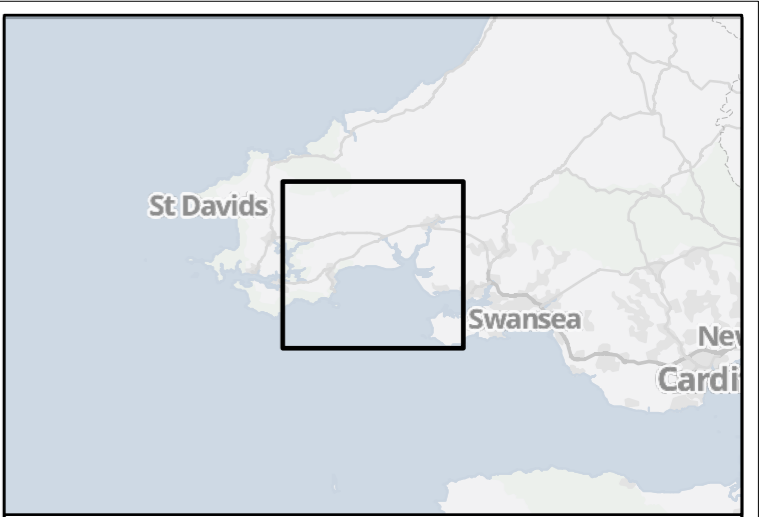
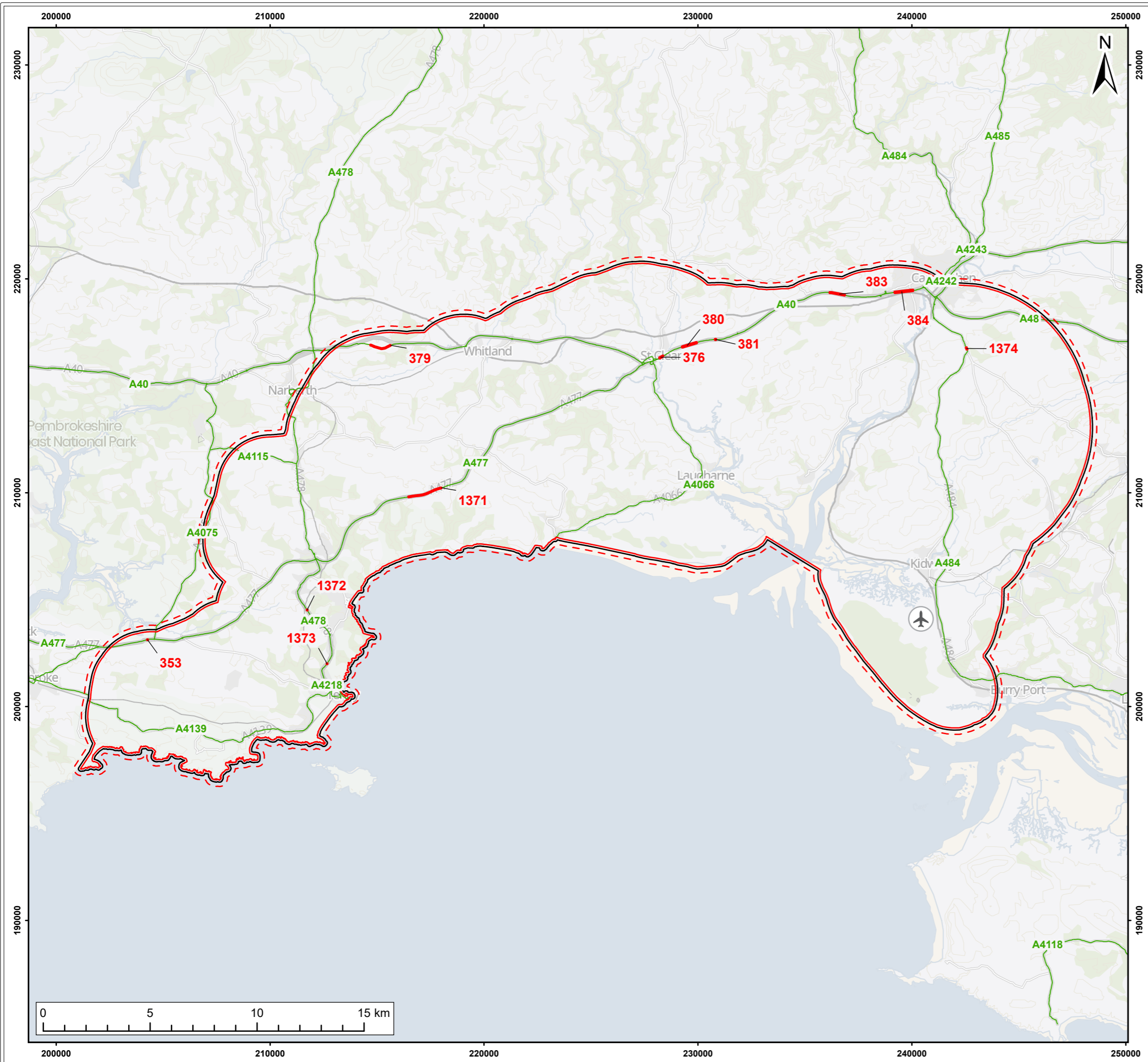
- Do you agree with the proposed Noise and Vibration Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on Noise and Vibration resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

3.8.1 Study Area

1375. For the EIA, the Onshore Study Areas for Noise and Vibration would extend from the Onshore Development Area to the closest Noise and Vibration sensitive receptors (NVSRs) in the following distances:

- Construction Noise Study Area – in accordance with the guidance in the DMRB LA111 Noise and Vibration Rev 2 (2020), construction noise impacts would only be assessed at NVSRs which are no further than 300m from the Onshore Development Area and any nearshore construction works;
- Construction Vibration Study Area – in accordance with the DMRB LA111, construction vibration impacts would only be assessed at NVSRs which are no further than 100m from the Onshore Development Area;
- Operation Noise Study Area – to ensure potential operational noise impacts are assessed, the proposed Onshore Transmission Station(s) has been assumed to have the potential to emit audible levels of operational noise. There is no applicable guidance on an appropriate study area for the assessment of operational noise impacts such as from Onshore Substations; this depends on sound emission levels from the Onshore Transmission Station(s) plant, which are not known at this stage. An onshore Noise and Vibration Study Area for operational effects, to capture all NVSRs that could experience significant effects, would be determined once the applicable design details are known. Consultation would be undertaken with relevant stakeholders once plant sound emissions data are available;
- Onshore Traffic Noise Study Area – in accordance with the DMRB, it incorporates the closest NVSRs (which are no more than 50m away) to the roads in the Traffic and Transport Study Area (see **Section 3.7 Traffic and Transport**) on which the Development traffic is anticipated to result in noise level changes of at least 1 A-weighted decibel (dB(A)). These road links would be identified once the required traffic data are available; and
- Offshore Construction Works Study Area – this study area incorporates the potential onshore NVSRs which could be affected by noise from offshore construction works. Based on professional judgement and experience of previous projects, this study area extends 20km from the proposed midpoint compensation infrastructure and would be identified once the infrastructure location is known.

1376. **Figure 3.8.1** shows the maximum potential size of the Construction Noise and Construction Vibration Study Areas based on the Onshore Scoping Boundary (**Figure 1.1.1**) and proposed nearshore construction works. These study areas would be refined prior to DCO submission once the Onshore Development Area has been identified.



Legend:

- Onshore Scoping Boundary
- Construction Vibration (100m)
- Construction Noise (300m)
- Priority/Proximity Area (Road)
- A Road
- Railway
- ✈ Airport

Source: © Haskoning UK Ltd, 2026, © Ordnance Survey, © Natural Resources Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
 Gwynt Glas Offshore Wind Farm Scoping Report

Title:
 Noise and Vibration Study Area

Figure: 3.8.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0037

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	05/03/2026	MW	LB	A3	1:175,000

Co-ordinate system: British National Grid



3.8.2 Baseline Environment

1377. This section provides a summary of baseline conditions in respect of Noise and Vibration. At this stage in the EIA process, it is not deemed necessary to identify NVSRs in the Study Areas, this would be done as part of the assessment provided in the EIA.
1378. The following have been identified in the Construction Noise Study Area:
- Potential sources of elevated baseline noise levels;
 - Road traffic Noise Action Planning Priority Areas (NAPPA) - locations where people’s homes are exposed to a noise level exceeding 73dB L_{den} , according to the 2017 Wales Strategic Noise Mapping undertaken by the Welsh Government (www.datamap.gov.wales) as part of its obligations under the Environmental Noise Directive (END) (2002/49/EC) (European Parliament, 2002), implemented in Wales by the Environmental Noise (Wales) Regulations 2006 (as amended), or where people live alongside concrete trunk roads; and
 - Areas considered to require protection from noise impacts, in accordance with the National Planning Policy Framework Section 15, Paragraph 185 aim (b) *‘identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason...’*.
1379. The Construction Noise Study Area includes locations in the administrative area of CCC and PCC and PCNP Authority.
1380. The Construction Noise Study Area is predominantly rural, comprising largely of arable and livestock agricultural land, where ambient noise levels are expected to be low. There are towns and small villages throughout the area where ambient noise levels may be slightly higher. Any noise data would be collected during a representative time period, i.e. outside of holiday periods.
1381. Based on a review of publicly available mapping and satellite imagery data for the Construction Noise Study Area, there is the potential for baseline noise levels to be elevated at NVSRs in proximity to the following identified sound sources, as shown on **Figure 3.8.1**:
- Major roads, in particular A40, A477, A478, and A48;
 - Activities at Pembrey West Wales Airport and Pembrey Circuit; and
 - Trains, primarily on the West Wales Line.
1382. Other sources of noise potentially contributing to the baseline could include industrial areas. These would be identified as part of the EIA process as required.
1383. DataMapWales (www.datamap.gov.wales) has been used to identify NAPPAs in the Construction Noise Study Area as shown on **Figure 3.8.1**. Those with ID 384, 383, 381, 380, 376 and 379 are located on the A40, while ID 1371 is located on the A477 and ID 1374 is located on the A484. These lie within the jurisdiction of Carmarthenshire CC and Pembrokeshire CC.
1384. The Construction Noise Study Area includes sections of National Park, NNR, LNR, National Forest and Country Parks, all of which are considered areas that are potentially prized for their recreational and amenity value. Once the Noise and Vibration Study Area has been refined, the list of applicable protected areas would be revised. This analysis would also consider other data, such as relevant planning policy and baseline noise levels in these areas.

1385. Baseline noise conditions are specific to individual locations and therefore not identified on a Development-wide basis.

3.8.3 Data Sources

1386. **Table 3.8.1** outlines existing primary data that have been used to inform this section and would also be used to inform the EIA.

Table 3.8.1 Existing Data Sources to Inform the Noise and Vibration Assessment

DATASET	DATA CONTENTS
Aerial Photography (Google Earth / Streetview)	Location of noise sources and NVSRs in the Noise and Vibration Study Areas
Local Authority Local Development Plans	Local policies relevant to Noise and Vibration and any areas designated for development which could introduce new NVSRs
NRW LIDAR Data (Open Licence)	Topographical data
OS Mapping	OS data, including locations of NVSRs
Local Authority Planning Portals	Baseline noise level data gathered as part of noise assessments to support other planning applications
Strategic Noise Mapping Data	Baseline noise level maps for roads, railways and industrial sites within the Noise and Vibration Study Areas

1387. In addition to the data in **Table 3.8.1**, **Table 3.8.2** describes the site specific surveys that will be undertaken to support the assessment. No baseline noise monitoring has been undertaken to date. Once the Noise and Vibration Onshore Study Area has been refined, a baseline noise survey will be undertaken to inform the assessment. Survey methodologies will be agreed in advance with stakeholders and relevant local authorities where possible. As mentioned in **Table 3.8.2**, baseline noise surveys will be proposed at locations representative of the potentially most affected noise sensitive receptors. In the first instance these will be residential locations closest to the assessed noise sources, where applicable for all **scoped in** construction and operational noise assessments. Receptors would be considered for baseline noise level surveys where either construction noise impacts last at least one month, or long-term operational noise impacts are anticipated.

1388. Baseline attended and unattended noise surveys, to determine existing noise levels, will be conducted in accordance with current guidance, including BS 7445:1991 ‘Description and measurement of environmental noise Part 2: Guide to the acquisition of data pertinent to land use’ and BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’.

1389. Traceable calibrated sound level meters would be used for all measurements during the surveys. Measurements would capture the following noise level parameters in 15-minute intervals: L_{Aeq} , L_{Amax} , L_{A90} and L_{A10} . Third-octave band sound levels would also be measured. The sound level

- meters would be calibrated before and after the survey using a portable sound pressure level calibrator.
- 1390. Records of the meteorological conditions during the survey will be made and measurements would not be considered valid during periods of rain or when average wind speeds exceed 5m/s.
 - 1391. Data collection would likely comprise a combination of short-term attended and longer-term (up to one week) unattended measurements. A weather station would also be deployed to identify site-specific meteorological conditions during the surveys.
 - 1392. A review of baseline data in published ESs and planning documents in the public domain for other developments will be undertaken, where such data are available and relevant.
 - 1393. The criteria adopted to assess construction vibration impacts are independent of vibration levels; therefore, a baseline vibration survey is not proposed to inform the construction vibration impact assessment.

Table 3.8.2 Site-specific Survey Data

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Baseline noise survey	Survey locations representative of nearest noise sensitive receptors closest to noise sources during construction and operation. Surveys informing construction noise assessments will be undertaken at receptors where there is considered to be a risk of a significant effect (for example due to prolonged night-time working and/or proximity to noisy works) and baseline noise levels could be above the Category A values in Table E.1 of BS5228-1 'Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise'. These will typically comprise a 24-hour unattended measurement on a weekday or be shorter and attended. Surveys for operational noise assessments (the Onshore Transmission Station(s) and associated infrastructure) will generally be unattended and include a weekend and three weekdays as minimum. The relevant LPA Environmental Health departments would be consulted on proposed locations and procedures, prior to undertaking the survey.	Anticipated to be 2027

3.8.4 Approach to Impact Assessment

- 1394. The Noise and Vibration assessment would be undertaken in accordance with relevant guidance and has been compiled in accordance with professional standards. The current guidance and standards which relate to this assessment are:
 - BS 4142:2014+A1:2019 – Methods for Rating and Assessing Industrial and Commercial Sound (BSI, 2014a);
 - BS 5228-1:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise (BSI, 2009a);
 - BS 5228-2:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration (BSI, 2009b);
 - BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings (BSI, 2014b);

- BS 7445-1:2003 Description and measurement of environmental noise. Guide to quantities and procedures (BSI, 2003);
 - BS 7445-2:1991 Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use (BSI, 1991);
 - Calculation of Road Traffic Noise (CRTN) DfT and Welsh Office, 1988);
 - DMRB, LA111 Noise and Vibration, Revision 2 (2020);
 - World Health Organisation (WHO) (1999) Guidelines for Community Noise;
 - WHO (2009) Night Noise Guidelines for Europe;
 - WHO (2018) Environmental Noise Guidelines for the European Region; and
 - IEMA (2014), Guidelines for Environmental Noise Impact Assessment.
1395. Onshore construction Noise and Vibration impacts would be assessed using guidance in BS 5228:2009+A1:2014 ‘Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise’ and Part 2: Vibration’. This guidance defines the accepted prediction methods and source data for various construction plant and activities.
1396. Construction traffic noise impacts would be calculated using the Basic Noise Level (BNL) methodology detailed in the CRTN (DfT and Welsh Office, 1988). The assessment would compare the calculated BNLs with and without the construction traffic. Any changes in day or night-time BNLs due to the Development would be assessed using short-term impact magnitude criteria taken from the DMRB.
1397. Operational noise impacts would be assessed using BS 4142:2014+A1:2019. This is the accepted UK standard for rating and assessing the impact of sound of an industrial and / or commercial nature. The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a residential dwelling upon which sound is incident.
1398. Following refinement of the Onshore Study Area, consultation with relevant local authorities and other stakeholders (where necessary) would be undertaken. Onshore Noise and Vibration would be included within the EPP (as set out in **Section 1.7 Consultation**) and further liaison with key stakeholders, as appropriate, would take place to agree the approach to data collection, and the specific assessment methods to be used.
1399. The impact assessment would follow the standard approach outlined in **Section 1.8 EIA Methodology**. **Table 1.8.1** is an example matrix to determine impact significance. The sensitivity of NVSRs is defined in **Table 3.8.3**.
- 3.8.4.1 Receptors
1400. A list of potential NSVR types which would be considered in the Noise and Vibration assessment is provided in **Table 3.8.3**. The receptors are classified according to their sensitivity, using professional judgement based on the potential for Noise and Vibration level changes to cause significant disruption.

Table 3.8.3 Definition of the Different Noise and Vibration Sensitive Receptor Types and Sensitivity Levels

RECEPTOR SENSITIVITY	DEFINITION	DEFINITIONS AND CLASSIFICATION TYPE, I.E. RECEPTOR
Very high	Receptors where noise or vibration level changes may significantly affect their usage.	Certain hospital wards (e.g. operating theatres or high dependency units), auditoria, laboratories with highly vibration sensitive equipment or buildings which are structurally unsound or identified as requiring special protection by cultural specialists (e.g. some historical / listed buildings or scheduled monuments).
High	Receptors where noise and / or vibration level changes may cause disturbance, protection is required but some tolerance is expected.	Residential accommodation, private gardens, hospital wards, care homes, schools, universities, research facilities and national parks (during the day).
Medium	Receptors where noise and / or vibration level changes may cause some distraction or disturbance.	Offices, shops (including cafes), outdoor amenity areas (including recreation, public amenity space / play areas), long distance footpaths (including PRow), bird watching areas, holiday parks / caravans, visitor attractions, doctor's surgeries, sports facilities and places of worship.
Low	Receptors where noise and / or vibration level changes are not expected to be detrimental.	Warehouses, light industry, car parks, and agricultural land.

3.8.5 Potential Impacts

3.8.5.1 Potential Impacts During the Construction Stage

3.8.5.1.1 Construction Noise

1401. The construction stage of the Development may emit noise with the potential to result in disturbance-related impacts at NVSRs. Noise impacts are anticipated due to the following construction activities:

- Earthworks;
- HDD or other trenchless crossing works for major obstacles;
- Trenched crossing works for minor obstacles;
- Onshore Export Cable installation and joint bay installation;
- Landfall works using HDD or other trenchless techniques and TJB installation;

- Landscaping;
- Piling (if required);
- Construction of above ground infrastructure at the Onshore Transmission Station(s);
- Nearshore works such as Onshore Export Cable laying; and
- Other general onshore construction activities such as establishment of temporary construction compounds and on-site plant operations.

1402. Construction noise impacts would be temporary and would vary both spatially and temporally in nature across the Construction Noise Study Area. The magnitude of the noise impacts is likely to depend on the baseline sound levels at the NVSRs, their proximity to the Development's construction activities and the duration and intensity of the works.
1403. Where the Development includes proposed construction activities with the potential to emit high noise levels at NVSRs inside the Construction Noise Study Area, these impacts are **scoped in** to the EIA.

3.8.5.1.2 Construction Vibration

1404. Potential construction vibration impacts include disturbance and structural damage. These would be assessed for all activities which are a potentially significant source of vibration, such as piling (if required), HDD or other trenchless techniques and vibratory rollers / compactors, where proposed within 100m of NVSRs.
1405. As with construction noise, vibration impacts would be temporary and would vary both spatially and temporally. The magnitude of the vibration impacts is likely to depend on the proximity of NVSRs to the Development's construction activities and the duration and intensity of the works.
1406. Where the Development includes proposed construction activities with the potential to emit high vibration levels at NVSRs inside the Construction Vibration Study Area, these impacts are **scoped in** to the EIA.

3.8.5.1.3 Construction Traffic Noise

1407. Construction of the Development may also result in increased traffic flows on nearby roads, thereby causing impacts due to increases in road traffic noise levels at NVSRs. This impact is also **scoped in** to the EIA.

3.8.5.1.4 Construction Traffic Vibration

1408. The primary mechanism for heavy vehicles to give rise to vibration is the movement of the vehicles over irregularities in the road surface. The DMRB states that "a maintained road surface would be free of irregularities as part of project design and under general maintenance, so operational vibration would not have the potential to lead to significant adverse effects". For those roads which are currently in good condition, there would be no pathway for the increase in traffic flows on public roads associated with the construction of the Development to increase vibration levels at sensitive receptors.
1409. If the construction traffic associated with the Development uses roads with existing surface irregularities, HGVs passing over these irregularities could generate vibration which is perceptible in nearby buildings. However, the additional HGVs introduced by the Development construction

would generate vibration which is at a similar level to that caused by HGVs currently using the road. Whilst the additional HGVs would increase the frequency of pass-bys, and therefore the frequency of potential exposure to perceptible vibration, vibration levels are not calculated cumulatively. The impact assessment criteria for both annoyance and building damage are based on exceedance of a fixed limit (specified in Peak Particle Velocity (PPV)) by one event (in this case, one HGV pass-by). The number of HGVs passing a property would therefore not affect the PPV experienced at a receptor in the way that it does for noise. Research undertaken by the Transport and Road Research Laboratory (TRRL Report 246) concludes that “Overall, fewer people are bothered by vibration from traffic than by traffic noise. However, the proportion of residents seriously bothered by vibration (8%) is similar to the percentage seriously bothered by noise (9%)” and hence, annoyance impacts due to vibration associated with construction traffic would be no worse than those due to noise. In accordance with best practice in the UK acoustics industry, the assessment therefore focusses on the potential for annoyance due to change in noise levels caused by construction traffic, and vibration effects due to construction traffic are **scoped out** of the EIA.

3.8.5.1.5 Construction of Offshore Infrastructure

1410. Construction activities, in particular piling, in any part of the Offshore Scoping Boundary, as shown on **Figure 1.1.1**, have the potential to increase noise levels at onshore NVSRs. The closest distance from Array Scoping Boundary to shore is around 42km. Considering a typical sound power level for offshore piling activities and the energy attenuation due to propagation over this distance, the noise emissions would not have the potential to exceed the criteria for the onset of significant effects at the onshore NVSRs (as identified in BS 5228:2009+A1:2014 ‘Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise’). However, there may be midpoint compensation (offshore structures) positioned around 20km from the shore. At this distance, noise emissions from piling (if required) could be perceptible, therefore this impact is **scoped in** to the EIA. Other offshore vibration emissions however are **scoped out** of the EIA.

3.8.5.2 Potential Impacts During the O&M Stage

3.8.5.2.1 Operational Onshore Transmission Station(s) and Infrastructure in the Onshore Transmission Station(s) Zone Noise

1411. Operational noise from the Onshore Transmission Station(s) and infrastructure in the Onshore Transmission Station(s) Zone has the potential to disturb occupants of nearby NVSRs.

1412. The magnitude of impact would depend on baseline noise levels at the NVSRs, their proximity to the Onshore Transmission Station(s), infrastructure in the Onshore Transmission Station(s) Zone and the plant sound emission levels. It would also depend on the acoustic characteristics of the Onshore Transmission Station(s) and infrastructure in the Onshore Transmission Station(s) Zone noise emissions, particularly whether they are likely to attract corrections for tonality, intermittency or impulsivity. Operational effects due to noise from the Onshore Transmission Station(s) and infrastructure in the Onshore Transmission Station(s) Zone have been **scoped in** to the EIA.

1413. There are no operational noise impacts anticipated from the buried infrastructure at the Landfall site and along the Onshore Cable Corridor Route. This is **scoped out** of the EIA.

3.8.5.2.2 Operational Traffic Noise

1414. **Section 3.7 Traffic and Transport**, describes the anticipated operational traffic movements for the Development. Operation stage traffic impacts associated with the Onshore Transmission Station(s) and infrastructure in the Onshore Transmission Station(s) Zone are **scoped out** of the EIA for the traffic and transport section. Operational traffic noise impacts are also **scoped out** for the EIA.

3.8.5.2.3 Operational Onshore Transmission Station(s) and Infrastructure in the Onshore Transmission Station(s) Zone Vibration

1415. The proposed Onshore Transmission Station(s) and infrastructure in the Onshore Transmission Station(s) Zone may include plant with the potential to be sources of vibration. However, in accordance with good industry practice, all onshore plant with the potential to emit high levels of vibration would be designed to minimise vibration transmitted into the ground (for example using flexible connectors and resilient mounts and mounting on a base of substantial mass). It is also the case that, once the vibration attenuation due to isolation and propagation with distance is accounted for, any ground-borne vibration which could be perceptible at receptors would cause damage to the plant emitting it. Such vibration issues would be controlled through site design and maintenance. As the vibration level would be negligible at source, it would be orders of magnitude less than what would be expected to give rise to significant effects at an NVSR. Therefore, operational effects due to vibration have been **scoped out** of the EIA.

3.8.5.2.4 Operational Traffic Vibration

1416. For the reasons discussed in **Section 3.8.5.1.4**, vibration due to operation stage traffic is not anticipated to have the potential to result in significant effects and is therefore **scoped out** of the EIA.

3.8.5.2.5 Operation of Offshore Infrastructure

1417. The operational offshore wind turbine generators would emit noise with the potential to increase noise levels at onshore NVSRs; however, the closest distance from the Array Scoping Boundary to shore is around 42km. Considering a typical sound power level for offshore turbine sound emissions and the energy attenuation due to propagation over this distance, the noise emissions would not have the potential to exceed the criteria for the onset of significant effects at the onshore NVSRs. Hence, noise and vibration emissions from the operation of the offshore infrastructure are **scoped out** of the EIA.

3.8.5.3 Potential Impacts During the Decommissioning Stage

1418. It is anticipated that decommissioning impacts on NVSR would be similar in nature to those of construction, although the magnitude of impact is likely to be lower.

1419. The same potential impacts noted for construction are therefore expected to be **scoped in (and out)** for decommissioning (as per **Table 3.8.4**).

3.8.5.4 Potential Inter-relationship Impacts

1420. The EIA would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to

identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. Inter-relationship impacts on Noise receptors are **scoped in** to the EIA and Vibration receptors are **scoped out** of the EIA for the reasons discussed in **Section 3.8.5.2.3**.

3.8.5.5 Potential Cumulative Impacts

1421. Onshore cumulative effects would be considered as part of the EIA process. Any other project with the potential to result in Noise and Vibration impacts that may act cumulatively with the Development would be identified during consultation and following a review of available information. These projects would then be included in the CEA. The CEA would follow the standard approach outlined in **Section 1.8 EIA Methodology**. Therefore, cumulative effects related to onshore Noise receptors are **scoped in** to the EIA and Vibration receptors are **scoped out** of the EIA for the reasons discussed in **Section 3.8.5.2.3**.

1422. The assessment would consider the potential for significant cumulative effects to arise due to the construction, operation and decommissioning of the Development, including the Onshore Export Cable Corridor and Onshore Transmission Station(s) and associated infrastructure, in the context of other developments that are existing, consented or at application stage.

3.8.5.6 Summary of Potential Impacts

1423. **Table 3.8.4** the onshore Noise and Vibration impacts which are proposed to be **scoped in** and / or **out** of the EIA. This may be refined as additional information and data become available.

Table 3.8.4 Summary of Impacts Proposed to be Scoped In (✓) and Out (x) for Onshore Noise and Vibration

POTENTIAL IMPACT	CONSTRUCTION	O&M (ONSHORE TRANSMISSION STATION(S) AND ASSOCIATED INFRASTRUCTURE ONLY)	DECOMMISSIONING
Noise affecting human NVSRs	✓	✓	✓
Vibration affecting human NVSRs	✓	x	✓
Road traffic noise affecting human NVSRs	✓	x	✓
Road traffic vibration affecting human NVSRs	x	x	x
Offshore infrastructure airborne noise	✓ (Only if midpoint compensation is required)	x	✓ (Only if midpoint compensation is required)
Inter-relationship Impacts	✓	✓ (Noise only)	✓

POTENTIAL IMPACT	CONSTRUCTION	O&M (ONSHORE TRANSMISSION STATION(S) AND ASSOCIATED INFRASTRUCTURE ONLY)	DECOMMISSIONING
Cumulative Impacts	✓	✓ (Noise only)	✓

3.8.6 Potential Mitigation Measures

1424. A number of embedded mitigation measures relevant to the Onshore Noise and Vibration assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
1425. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to Noise and Vibration impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**. The assessment of impacts would be made with these embedded mitigation measures in place.
1426. Requirements for any additional mitigation measures would be determined through the EIA.
1427. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice

3.9 Air Quality

1428. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Air Quality.
1429. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Air Quality receptors in the Development's ES.
1430. The onshore Air Quality assessment is likely to have key inter-relationships with the following topic, which would be considered appropriately where relevant in the EIA:

- **Section 1.5 Project Description;**
- **Section 3.1 Terrestrial Ecology and Onshore Ornithology;**
- **Section 3.2 Geology and Land Quality;**
- **Section 3.7 Traffic and Transport;**
- **Section 3.8 Noise and Vibration;**
- **Section 4.1 Population and Human Health;**
- **Section 4.2 Socio-economics; and**
- **Section 4.3 Tourism and Recreation.**

The following questions are posed to consultees to help them frame and focus their response to the Air Quality scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Air Quality Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on Air Quality resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

3.9.1 Study Area

1431. The construction stage of the onshore elements of the Development may give rise to dust and particulate matter (PM) from construction related activities, emissions from Non-Road Mobile

Machinery (NRMM) and emissions from construction road traffic on the local road network. These criteria in turn inform the Air Quality Study Area.

1432. Offshore Air Quality impacts are proposed to be **scoped out** of the EIA because they are anticipated to be short-term, intermittent and localised over open sea with no relevant human exposure or ecological receptors sensitive to air pollution within relevant distances. Therefore, offshore Air Quality effects are considered to be not significant.
1433. It is assumed that impacts to Air Quality would occur wholly within the Onshore Scoping Boundary, therefore for the purpose of scoping, the Onshore Study Area for Air Quality consists of the Onshore Scoping Boundary as shown on **Figure 3.9.1**.
1434. The Onshore Study Area for Air Quality within the EIA would be refined based on the Onshore Development Area once the locations of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are selected using the criteria detailed below. The study area for Air Quality is hereafter referred to as the Air Quality Study Area and would be formulated based on the below criteria:

➤ Dust and PM emissions during the construction stage:

- Human receptors within 250m of the Onshore Development Area and within 50m of trackout (i.e. the transport of dust and dirt from the construction site onto the public road network) routes, extending 250m from the Onshore Development Area site exit(s); and
- Ecological receptors within 200m of the Onshore Development Area and within 50m of trackout routes used by construction vehicles on the public highway, extending up to 250m from the Onshore Development Area site exit(s).

➤ NRMM emissions during the construction stage:

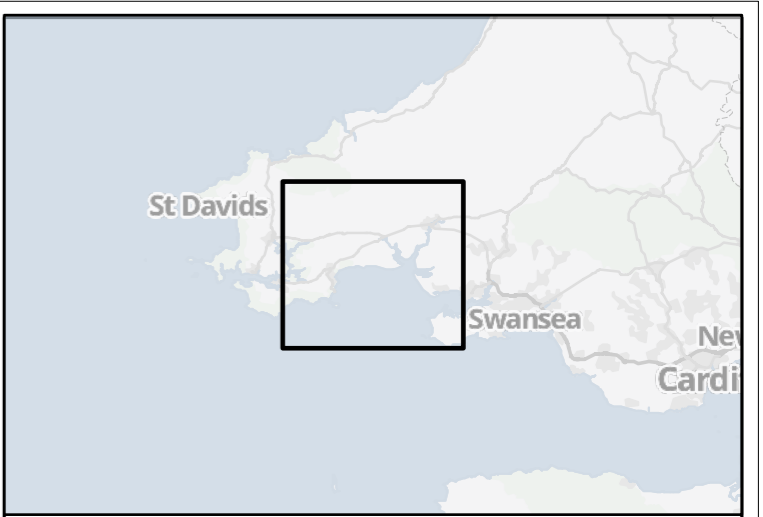
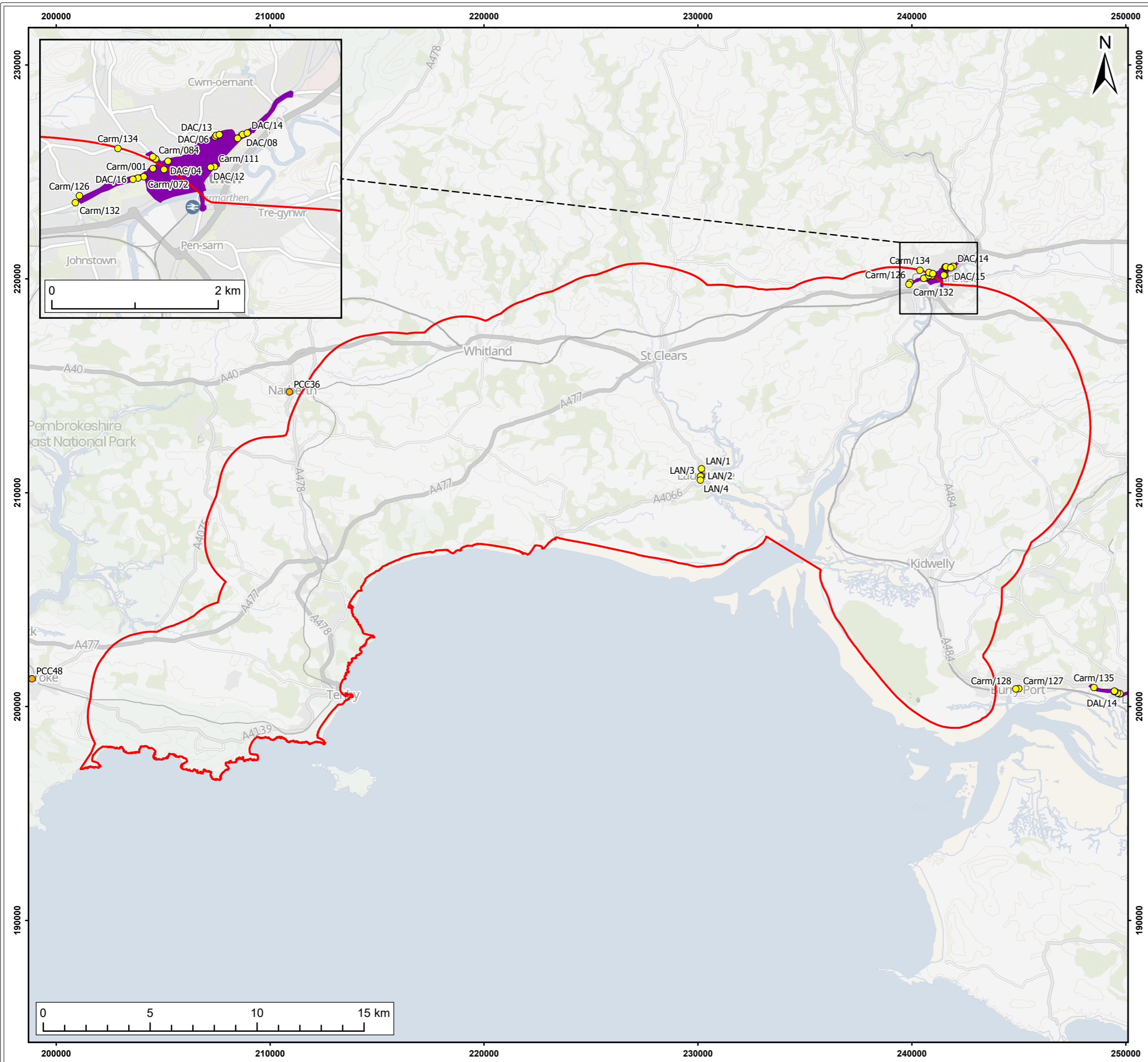
- Human and ecological receptors within 200m of the Onshore Development Area where NRMM would be located.

➤ Road traffic emissions during the construction stage:

- Human receptors within 200m of all roads that trigger the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) traffic screening criteria (EPUK and IAQM, 2017); and
- Ecological receptors within 200m of all roads that trigger the DMRB screening criteria (National Highways, 2024).

➤ Vessel emissions in the construction stage:

- Human and ecological receptors up to within 1km of large ship movements (e.g. bulk cargo or container ships) including berths and main area of manoeuvring.



- Legend:
- Onshore Scoping Boundary / Air Quality Study Area
 - Air Quality Management Areas (AQMA)
 - CCC Diffusion Tube Monitoring
 - PCC Diffusion Tube Monitoring

Source: © Haskoning UK Ltd, 2026. © Natural Resource Wales
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
Gwynt Glas Offshore Wind Farm Scoping Report

Title:
Air Quality Study Area and Air Quality Management Areas and Monitoring

Figure: 3.9.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0102

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	26/03/2026	GC	KD	A3	1:175,000

Co-ordinate system: OSGB 1936 British National Grid



3.9.2 Baseline Environment

1435. Air Quality effects arising from the construction of projects of this nature are typically associated with the impacts of dust generation and road traffic emissions. The spatial extent of the road network which would be utilised by the Development is not yet fully defined but is likely to include road links within PCC and CCC administrative areas. As such, at this stage, baseline Air Quality conditions have been considered within both local authority boundaries.
1436. The Air Quality Study Area is located within the PCC and CCC’s area of jurisdiction. The latest Air Quality Progress Reports (PCC, 2025 and CCC, 2023) note that PCC currently has two Air Quality Management Areas (AQMAs) and CCC has three AQMAs declared for exceedances of the annual mean nitrogen dioxide (NO₂) objective, citing vehicle emissions as having an influence on local Air Quality. The nearest PCC AQMA to the Air Quality Study Area is approximately 3 km west in the centre of Pembroke. A portion of the CCC AQMA (Carmarthen AQMA) is located within the Air Quality Study Area.
1437. PCC’s AQMAs (Pembroke and Haverfordwest) have been compliant with the annual mean NO₂ Air Quality objective for three and four years respectively. Monitoring data is being continually reviewed with the intention of revoking these AQMA designations in 2025. At the time of writing, PCC is currently undertaking a public consultation on the revocation of the above AQMAs. It is understood that Air Quality monitoring would continue.
1438. Annual mean NO₂ concentrations within CCC’s AQMA have observed a continued improvement over the last five to seven years with concentrations for the latest year of publicly available monitoring data (2023) recorded within the annual mean NO₂ Air Quality objective and indicates a potential sustained compliance which could lead to revocation of the designated AQMAs.
1439. The Air Quality Study Area is predominantly rural in nature. Therefore, higher levels of pollutants are likely to occur in closer proximity to major roads and more densely populated areas such as Carmarthen. It is expected that roads within PCC and CCC’s area of jurisdiction are likely to be used by Development-related traffic.

3.9.3 Data Sources

1440. **Table 3.9.1** outlines existing primary data that have been used to inform this section and would also be used to inform the EIA.

Table 3.9.1 Data Sources to Inform the Air Quality Assessment

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Pembrokeshire Council 2025 Air Quality Progress Report	PCC’s administrative area	2020-2024
Carmarthen County Council 2023 Air Quality Progress Report	Carmarthen County Council’s administrative area	2018-2022
Defra Mapped Background data for local authorities	UK wide background pollutant mapping for 1km x 1km grid squares	2021-2040

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Air Pollution Information System Modelled Background pollution concentrations	UK wide information background pollution concentrations, and habitat specific Critical Loads	2021

1441. Based on the approach taken to other infrastructure projects of this nature within this area, it is expected that there would be sufficient data available from monitoring undertaken by the relevant local authorities as part of their statutory duties for use in the Air Quality assessment. As such, it is not proposed to collect any primary data (i.e. a project-specific Air Quality survey) for the assessment. This would be agreed with the relevant county council, PCC or CCC, through the EPP once the Air Quality Study Area is fully defined for the EIA.

3.9.4 Approach to Impact Assessment

1442. The terminology and method used for each assessment differs from the generic impact assessment terminology as outlined in **Section 1.8 EIA Methodology**. The assessment would be undertaken in accordance with relevant technical guidance as follows:

- Defra Local Air Quality Management Technical Guidance (LAQM.TG) (22) (Defra, 2025);
- IAQM Guidance on the Assessment of Dust from Demolition and Construction (v2.2 January 2024) (IAQM, 2024);
- IAQM A guide to the assessment of air quality impacts on designated nature conservation sites (IAQM, 2020);
- IAQM Guidance on the assessment of odour for planning (IAQM, 2018);
- EPUK and IAQM Land-Use Planning and Development Control: Planning for Air Quality (EPUK and IAQM, 2017);
- National Highways DMRB LA105: Air Quality (National Highways, 2024); and
- NEs approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NE, 2018a).

3.9.4.1 Receptors

1443. The following receptors may be sensitive to changes in Air Quality and have therefore been identified as relevant to the Air Quality assessment and located within the Air Quality Study Area:

- Human receptors, such as residential properties, schools, nurseries, care homes and hospitals; and
- Designated ecological receptors, within designated ecological sites (see **Table 3.1.1** within **Section 3.1 Terrestrial Ecology and Onshore Ornithology**) where these contain habitats and features which are sensitive to changes in airborne concentrations of nitrogen and / or NH₃ and / or deposition of nitrogen and / or acid.

3.9.5 Potential Impacts

3.9.5.1 Potential Impacts During the Construction Stage

3.9.5.1.1 Construction Dust and Exhaust Emissions

1444. Impacts during construction may occur at human and ecological receptors as a result of the generation of dust and PM during onshore construction works, e.g. from earthworks and stockpiling of soils. Impacts may also occur as a result of exhaust emissions from construction stage plant and road vehicle movements generated during construction. These emissions would add to existing pollutant concentrations at human receptors and pollutant concentrations and deposition levels at designated ecological sites. As such, Air Quality impacts during construction have been **scoped in** to the EIA.

3.9.5.1.2 Construction Traffic Emissions

1445. Once traffic demand is known, an initial screening exercise would be undertaken to determine if a detailed assessment of road traffic emissions is required. If the screening criteria are exceeded, a detailed road traffic emissions assessment may be required. Dispersion modelling software would be used to predict increases in NO₂, PM₁₀ and PM_{2.5} concentrations resulting from construction traffic at identified human receptor locations, and, NO_x / NO₂ and NH₃ concentrations (from which nitrogen and acid deposition rates would be derived) at designated ecological receptors within 200m of the road links that trigger the relevant screening criteria. The technical approach to the Air Quality assessment would be in accordance with Defra LAQM.TG (22).

3.9.5.1.3 NRMM Emissions

1446. Impacts may occur from NRMM exhaust emissions during construction. NRMM emissions may contribute to existing pollutant concentrations at human and ecological receptors. Therefore, the impacts from construction stage NRMM have been **scoped in** to the EIA and would be assessed in accordance with Defra LAQM.TG (22).

3.9.5.1.4 Marine Plant and Vessel Emissions During Construction

1447. There is the potential for the construction stage to involve the use of marine-based construction plant and dredging plant. Exhaust emissions from vessel movements generated during construction have the potential to cause impacts at nearby human and ecological receptors. The potential impacts of air emissions from these sources at onshore human receptors would therefore be **scoped in** to the EIA and screened in accordance with the thresholds within LAQM.TG (22).

3.9.5.1.5 Odour Impacts from Disturbance of Landfill Sites

1448. It is understood that there are 33 historic landfill sites and two authorised landfill sites across the wider Onshore Scoping Boundary. During the construction of the onshore cable route there may be the potential for odour emissions to arise resulting from disturbance of these landfill sites. As such, a qualitative odour assessment has been **scoped in** to the EIA and would be undertaken in accordance with the IAQM guidance on the assessment of odour for planning (IAQM, 2018), to determine the potential for odour impacts at sensitive human receptors.

3.9.5.2 Potential Impacts During the O&M Stage

1449. It is expected that Air Quality impacts during the operational stage would be negligible. During operation, the infrastructure would not generate any emissions to air, and it is expected that maintenance activities would generate a nominal amount of additional road vehicles on an infrequent basis, which would not give rise to any significant Air Quality effects. It is therefore proposed to scope operational stage Air Quality impacts **out** of the ES. This is consistent with the approach agreed by the Planning Inspectorate for other offshore wind projects such as Hornsea Four and Sheringham Shoal and Dudgeon Extension Projects.

3.9.5.3 Potential Impacts During the Decommissioning Stage

1450. It is anticipated that decommissioning impacts during decommissioning are expected to be similar in nature to those anticipated during construction, but of smaller magnitude.

1451. The same potential impacts noted for construction are therefore expected to be **scoped in** for decommissioning.

3.9.5.4 Potential Inter-relationship Impacts

1452. The EIA would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that interrelationship impacts on Air Quality receptors are **scoped in** to the EIA during construction and decommissioning.

3.9.5.5 Potential Cumulative Impacts

1453. Cumulative impacts of dust and construction plant emissions may occur as a result of concurrent construction activities associated with other plans or projects within the Air Quality Study Area, where they interact spatially with those of the Development. Cumulative impacts may also arise as a result of traffic generated by other plans and projects which uses the road network along which Development-generated vehicles are expected to travel. These cumulative impacts may affect both human and ecological receptors. Cumulative impacts have therefore been **scoped in** to the EIA for construction. As noted above, it is proposed that operational impacts are **scoped out** and decommissioning stage impacts are **scoped in**.

3.9.5.6 Summary of Potential Impacts

1454. **Table 3.9.2** outlines the impacts which are proposed to be **scoped in** to and / or **out** of the EIA. This may be refined as additional information and data become available.

Table 3.9.2 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) of the Air Quality Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Impacts of emissions from dust from earthworks and construction on human and ecological receptors	✓	×	✓

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Impacts of emissions from plant and machinery on human health	✓	×	✓
Impacts of emissions from road traffic on human health and ecological sites	✓	×	✓
Impacts of odours on human receptors	✓	×	✓
Inter-relationship Impacts	✓	×	✓
Cumulative Impacts	✓	×	×

3.9.6 Potential Mitigation Measures

1455. A number of embedded mitigation measures relevant to the Onshore Air Quality assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
1456. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to Air Quality impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.
1457. Requirements for any additional mitigation measures would be determined through the EIA.
1458. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

4 Project Wide Aspects

4.1 Population and Human Health

1459. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Population and Human Health.
1460. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Population and Human Health receptors in the Development's ES.
1461. The Population and Human Health assessment would have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:

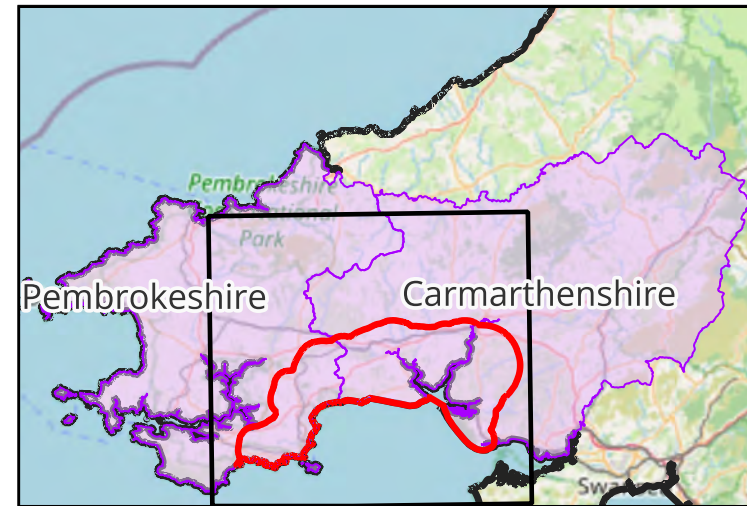
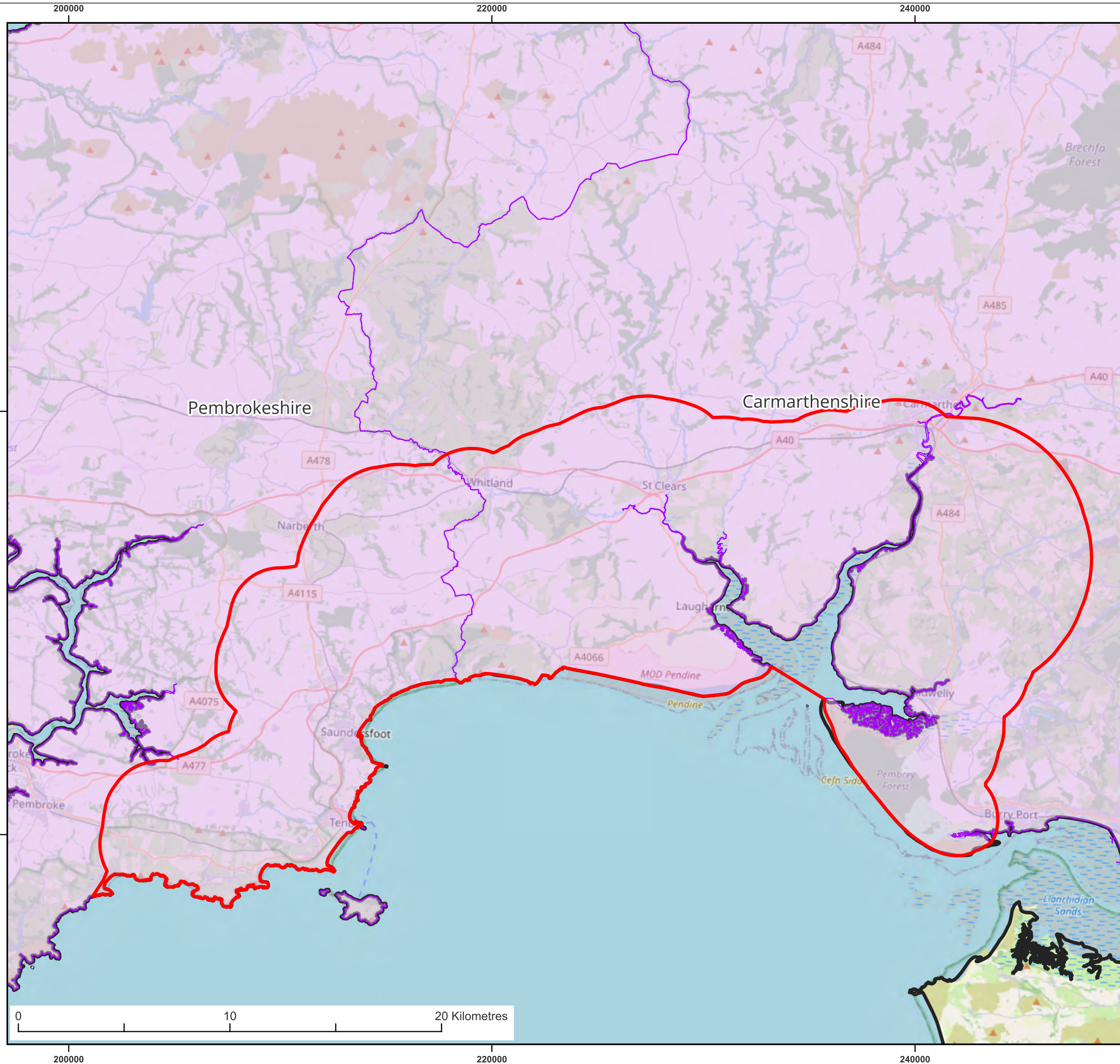
- **Section 1.5 Project Description;**
- **Section 2.6 Commercial Fisheries;**
- **Section 2.9 Infrastructure and Other Users;**
- **Section 3.7 Traffic and Transport;**
- **Section 3.8 Noise and Vibration;**
- **Section 3.9 Air Quality;**
- **Section 4.1 Tourism and Recreation;**
- **Section 4.2 Socio-economics; and**
- **Section 4.4 CCR.**

The following questions are posed to consultees to help them frame and focus their response to the Population and Human Health scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Population and Human Health Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on the Population and Human Health resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

4.1.1 Study Area

- 1462. The human health assessment would be informed by the study areas, zones of influence and receptors impacted or potentially impacted by other EIA sections.
- 1463. The onshore components, comprising the new Onshore Transmission Station(s), Onshore Export Cables and onward grid connection to the National Grid substation, could be located across both Pembrokeshire County and Carmarthenshire County.
- 1464. Environmental health determinants (such as changes to air quality and noise exposure) are likely to have a local impact where the potential change in hazard exposure is limited by physical dispersion characteristics.
- 1465. Wider socio-economic health determinants (such as employment and related income generation) have a broader geographic scope of influence than environmental health determinants, as commuting patterns often involve travelling significant distances to work.
- 1466. Based on the location of onshore components associated with the proposed development, the study area for all baseline statistics is proposed to focus on Pembrokeshire and Carmarthenshire (hereafter referred to as the Population and Human Health Study Area), using the national (Wales) average as a relevant comparator (refer to **Figure 4.1.1**).
- 1467. Once the location of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are selected, the Population and Health Study Area would be refined.



Legend:

- Onshore Study Area
- Onshore Scoping Boundary
- Wales

Source: © Haskoning UK Ltd, 2026
 Base map: Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © <https://www.openstreetmap.org> and contributors., Contains OS data © Crown Copyright and database right 2024

Project: **Gwynt Glas Offshore Wind Farm Scoping Report**

Title: **Population and Human Health Study Area**

Figure: 4.1.1 | Drawing No: PC6850-HAS-ZZ-ZZ-DR-GS-0004.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	19/03/2026	SB	TB	A3	1:180,000
02	25/03/2026	SB	TB	A3	1:180,000
03	09/06/2026	SB	TB	A3	1:180,000

Co-ordinate system: OSGB36 / British National Grid



4.1.2 Baseline Environment

1468. Different communities have varying circumstances and levels of sensitivity to population, health and socio-economic change (both adverse and beneficial) as a result of social and demographic structure, behaviour and relative economic circumstances.
1469. An initial desktop study has been undertaken, detailed in **Table 4.1.1**, to establish local Population and Human Health circumstance, priorities and needs across the Population and Human Health Study Area. This involved the collection and interpretation of published socio-economic and public health data, contrasted against national datasets. The baseline assessment for the EIA would build on this initial review to include trend analysis where possible, and to reflect any amendments to the study area as the design evolves.
1470. **Table 4.1.1** outlines the existing health circumstance within the study area to inform the scoping exercise and would be expanded upon for the EIA. The figures provided for the Population and Human Health Study Area are an average of Pembrokeshire County and Carmarthenshire County values. The following colour coding has been applied to aid analysis:
- Better than the Welsh national average – **green**; and
 - Worse than the Welsh national average – **orange**.

Table 4.1.1.1 Local Health Circumstance Summary

INDICATOR	DATE	POPULATION AND HUMAN HEALTH STUDY AREA	WALES
Socio-economic circumstance			
Wales Index of Multiple Deprivation score	2025	5.2	5.5
Percentage of households deprived in employment section	2021	13.1	13.8
Percentage of children living in workless households	2023	11.5	10.9
Percentage of school pupils eligible for free school meals	2021	23.8	26.6
Percentage of households in fuel poverty	2018	14.1	12.0
Percentage of workless households	2023	15.0	16.0
Physical health			

Gwynt Glas Offshore Wind Farm Scoping Report

INDICATOR	DATE	POPULATION AND HUMAN HEALTH STUDY AREA	WALES
Emergency hospital admissions for all causes, all ages (per 100,000 population)	2024/25	25,882.4	24,031.8
Emergency hospital admissions for coronary heart disease (per 100,000 population)	2024/45	291.0	276.0
Emergency hospital admissions for stroke (per 100,000 population)	2024/25	135.6	136.1
Emergency hospital admissions for heart attack (per 100,000 population)	2024/45	100.2	96.5
Emergency hospital admissions for chronic obstructive pulmonary disease (COPD) (per 100,000 population)	2024/25	109.8	163.9
Deaths from all causes, all ages (per 100,000 population)	2024	985.6	1,016.4
Deaths from all cancer, all ages (per 100,000 population)	2024	244.6	260.8
Deaths from circulatory disease, all ages (per 100,000 population)	2024	228.7	239.7
Deaths from coronary heart disease, all ages (per 100,000 population)	2024	94.5	96.1
Deaths from stroke, all ages (per 100,000 population)	2024	44.4	51.1
Deaths from respiratory diseases, all ages (per 100,000 population)	2024	110.2	128.1
Mental health and behavioural risk factors			
Emergency hospital admissions for intentional self-harm (Standardised Admission Ratio)	2024/25	76.5	60.6
Hospital admissions for alcohol attributable conditions, narrow definition	2024/25	511.7	447.5
Percentage of children aged 4 to 5 with obesity	2023/24	12.6	11.8

INDICATOR	DATE	POPULATION AND HUMAN HEALTH STUDY AREA	WALES
Percentage of children aged 4 to 5 overweight or with obesity	2023/24	29.2	25.5
Percentage of adults classified as overweight or obese	2021	61.5	62.0
Percentage of physically active adults	2016/17 – 2017/18	58.0	53.0

1471. The majority of indicators at the Population and Human Health Study Area level show better socio-economic circumstance than the national average, with the only exceptions being the percentage of children living in workless households and percentage of households in fuel poverty.
1472. Emergency hospital admissions for all causes in the Population and Human Health Study Area are higher than the Wales average. The same is true for hospital admissions from coronary heart disease and heart attack, while hospital admissions for stroke and COPD show lower rates than the national average.
1473. In contrast, mortality rates from all causes within the Population and Human Health Study Area are lower than the Wales average. The same is true for all specific health outcomes analysed (cancer, circulatory disease, coronary heart disease, stroke and respiratory disease). As such, the Population and Human Health Study Area shows a lower physical health burden compared to the national average.
1474. **Table 4.1.1** shows the hospital stays for self-harm, this shows a higher rate in the Population and Human Health Study Area compared to the national average. Similarly, the number of hospital stays due to alcohol attributable conditions is higher in the Population and Human Health Study Area compared to the Wales average.
1475. When analysing lifestyle and behavioural risk factors for children, the prevalence of overweight and obese children aged 4 to 5 in the Population and Human Health Study Area is higher than the national average. This differs to the adult population in the Population and Human Health Study Area, who show lower rates of overweightness and obesity, as well as higher rates of physical activity, compared to the national average.

4.1.3 Data Sources

1476. **Table 4.1.2** outlines existing primary data that have been used to inform this section and would also be used to inform the EIA.

Table 4.1.2 Data Sources to Inform the Population and Human Health Assessment

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Health Maps Wales	County and national level	Listed in Table 4.1.1 for each indicator

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Data Cymru	County and national level	Listed in Table 4.1.1 for each indicator
Welsh Housing Conditions Survey 2017-18	County and national level	Listed in Table 4.1.1 for each indicator
Child Measurement Programme	County and national level	Listed in Table 4.1.1 for each indicator

1477. Site surveys will not be required to inform the Population and Human Health assessment.

4.1.4 Approach to Impact Assessment

4.1.4.1 Introduction

1478. The following guidance and best practice are proposed to be followed for the assessment of Population and Human Health:

- Health Impact Assessment (HIA): A practical guide (Wales HIA Support Unit (WHIASU, 2012));
- ISEP Guide to Effective Scoping of Human Health in EIA (IEMA, 2022a); and
- ISEP Guide to Determining Significance for Human Health in EIA (IEMA, 2022b).

1479. The ISEP Guide to Effective Scoping of Human Health in EIA states “Where an EIA is undertaken and there is also a requirement for HIA, projects should normally meet the HIA requirement through the ES health Section”, on this basis, a separate HIA is not necessary, as the principles and objectives of the HIA are to be fully embedded within the regulatory assessment process, and front loaded into the design process to inform healthy urban design solutions geared to addressing current circumstance priority and need.

4.1.4.2 Proposed Assessment Methodology

4.1.4.2.1 Receptor Sensitivity

1480. Within a defined population, individuals range in level of sensitivity, due in part to a series of factors such as age, socio-economic deprivation, and the prevalence of any pre-existing health conditions which could become exacerbated. Sensitive individuals can be considered particularly vulnerable to changes in environmental and socio-economic factors (both adversely and beneficially), whereby they could experience disproportionate effects when compared to the general population.

1481. As an example, the elderly, young children and individuals with chronic pre-existing respiratory conditions would be more sensitive to adverse changes to air quality, with the potential for emergency admission to hospital more likely than for someone of working age who has good respiratory health. In contrast, an individual who has been unemployed for a long period would benefit more from employment opportunities and associated effects on their wellbeing generated by the Development in comparison to an individual who is already employed.

- 1482. The health sensitivity methodology criteria shown in Table 7.1 of the ISEP Guide to Determining Significance for Human Health in EIA, referenced above, is proposed to be used to inform the assessment of significance.
- 1483. The baseline assessment would inform the sensitivity classification when considering population health outcomes for the general population.
- 1484. In addition, vulnerable groups would be considered within the population and health assessment. The identification of vulnerable groups would be consistent with the protected characteristics referenced in the Equality Act and is considered sufficient to discharge the public sector equality duty. To reflect the increased sensitivity of these group, a uniformly ‘high’ sensitivity classification would be applied.

4.1.4.2.2 Magnitude of Impact

- 1485. The health magnitude criteria shown in Table 7.2 of the ISEP Guide to Determining Significance for Human Health in EIA is proposed to be used to inform the assessment of significance.

4.1.4.2.3 Significance of Effect

- 1486. The significance of effect is determined based on the sensitivity of a receptor and the magnitude of an impact. The method proposed for the Population and Human Health assessment is the same as that outlined in the matrix illustrated by **Table 1.8.2 in Section 1.8 EIA Methodology**. Where a range of significance levels are presented, the overall assessment for each effect would be based upon expert judgement.
- 1487. **Table 4.1.3** provides a description of each significance level. For this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 4.1.3 Significance Conclusion and Reasoning Related to Public Health

CATEGORY / LEVEL	INDICATIVE CRITERIA
Major (significant)	<p>This is significant for public health because:</p> <ul style="list-style-type: none"> ➤ Changes, due to the Development, have a substantial effect on the ability to deliver current health policy and / or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. ➤ Change, due to the Development, could result in a regulatory threshold or statutory standard being crossed (if applicable). ➤ There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the Development and changes to health outcomes.

CATEGORY / LEVEL	INDICATIVE CRITERIA
	<ul style="list-style-type: none"> ➤ In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the Development.
Moderate (significant)	<p>This is significant for public health because:</p> <ul style="list-style-type: none"> ➤ Changes, due to the Development, have an influential effect on the ability to deliver current health policy and / or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views. ➤ Change, due to the Development, could result in a regulatory threshold or statutory standard being approached (if applicable). ➤ There is likely to be a small change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the Development and changes to health outcomes. ➤ In addition, health priorities for the relevant study area are of general relevance to the determinant of health or population group affected by the Development.
Minor (not significant)	<p>This is not significant for public health because:</p> <ul style="list-style-type: none"> ➤ Changes, due to the Development, have a marginal effect on the ability to deliver current health policy and / or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and / or that no relevant consultation themes emerge among stakeholders. ➤ Change, due to the Development, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable). ➤ There is likely to be a slight change in the health baseline of the population, including as evidenced by the effect size and / or scientific literature showing there is only a suggestive relationship between changes that would result from the Development and changes to health outcomes. ➤ In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the Development.
Negligible (not significant)	<p>This is not significant for public health because:</p> <ul style="list-style-type: none"> ➤ Changes, due to the Development, are not related to the ability to deliver current health policy and / or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the Development having no responses on this issue among stakeholders.

CATEGORY / LEVEL	INDICATIVE CRITERIA
	<ul style="list-style-type: none"> ➤ Change, due to the Development, would not affect a regulatory threshold, statutory standard or guideline (if applicable). ➤ There is likely to be a very limited change in the health baseline of the population, including as evidenced by the effect size and / or scientific literature showing there is an unsupported relationship between changes that would result from the Development and changes to health outcomes. ➤ In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the Development.

4.1.5 Receptors

1488. The local population in the Population and Human Health Study Area is the primary receptor considered for the Population and Human Health assessment. Transient tourists and visitors would not be considered as part of the Population and Human Health assessment.

4.1.6 Potential Impacts

1489. This section outlines all relevant determinants of health outlined in ISEP's Guide to Effective Scoping of Human Health in EIA, setting the justification for all matters to be **scoped in** and **out** of the proposed health assessment.

4.1.6.1 Potential Impacts During the Construction Stage

1490. **Table 4.1.4** outlines all health determinants listed in ISEP's Guide to Effective Scoping of Human Health in EIA and provides a rationale for scoping in or out of the construction stage assessment.

Table 4.1.4 Potential Impacts on Determinants of Health during the Construction Stage to be scoped in to and / or out of the Population and Human Health Assessment

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
Health related behaviours	Physical activity	Scoped in – although the onshore elements of the Development would be built predominantly on agricultural land, some nearby PRow and open space used for physical activity could be affected (including marine and intertidal areas). On this basis, the impacts and mitigation associated with this would be assessed in Section 4.1 Population and Human Health in the ES.

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Risk taking behaviour ¹⁴	<p>Scoped in – risk taking behaviour during construction is generally associated with a large non-home-based workforce who temporarily relocate to the area surrounding the Development and may contribute to a change in the social / cultural environment locally.</p> <p>As outlined in Section 4.2 Socio-economics a social impact assessment would be undertaken, which would assume a worst case scenario, in which a high proportion of the workforce is transient. As such, any changes in risk taking behaviour would be assessed within Section 4.1 Population and Human Health in the ES.</p>
	Diet and nutrition	<p>Scoped out – while the Development would potentially result in the temporary and permanent (in the case of the Onshore Transmission Station(s)) loss of agricultural land, this would not have a material impact on access to food, diet or nutrition during construction. This would be addressed in Section 3.4 Land Use where appropriate and necessary in the ES.</p>
Social environment	Housing	<p>Scoped in – impacts on housing during construction is generally associated with a large non-home-based workforce who temporarily relocate to the area surrounding the Development.</p> <p>As outlined in Section 4.2 Socio-economics a social impact assessment would be undertaken, which would assume a worst case scenario, in which a high proportion of the workforce is transient. As such, any impacts on housing demand would be assessed within Section 4.1 Population and Human Health in the ES.</p>
	Relocation	<p>Scoped out – the proposed cable route would seek to avoid residential dwellings. As a result, any requirement for relocation would only be expected to arise in exceptional circumstances. Given the highly limited likelihood and negligible scale of any such impact, relocation effects are considered insignificant and have therefore been scoped out of further assessment.</p>
	Open space, leisure and play	<p>Scoped in – although the onshore area of the Development would be built predominantly on agricultural land, some nearby PRoW and open space (including marine and intertidal areas) could be affected, thereby affecting access to areas of leisure and play. On this basis, the impacts and mitigation associated with this would be assessed in Section 4.1 Population and Human Health in the ES.</p>

¹⁴ The ways in which the Development affects behaviours, including opportunities to reduce risk taking behaviours for its workforces and end users. Issues include use of alcohol, cigarettes, non-prescribed drugs, problem gambling and communicable illness (including Sexually Transmitted Infections and other infections).

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Transport modes, access and connections	<p>Scoped in – the Development would generate changes in transport nature and flow rate on existing transport infrastructure through the delivery of construction materials and worker travel.</p> <p>As such, the Population and Human Health effects associated with changes in transport and access during the construction stage would be scoped in to the ES to more effectively communicate the themes most relevant to health and wellbeing (i.e., severance, pedestrian and cyclist amenity, fear and intimidation and risk of road traffic accidents / injury).</p> <p>The Population and Human Health topic would draw from and build on key outputs from Section 3.7 Traffic and Transport in order to carry out the assessment and reach a conclusion regarding the significance of effect in Population and Human Health terms in the ES.</p>
	Community safety	<p>Scoped out – during the construction stage of the Development, the site would be subject to security measures that deter the potential for any anti-social behaviour and / or crime. In addition, any contractors hired would be subject to the Considerate Contractors Scheme to reduce any impacts on the local community, while the safety of construction workers themselves would be ensured through relevant measures required under the Health and Safety at Work Act.</p>
	Community identity, culture, resilience and influence	<p>Scoped out – construction of the Development may impact the visual environment. However, this would be temporary, subjective and would only impact a small proportion of the Population and Human Health Study Area population.</p>
	Social participation, interaction and support	<p>Scoped out – the Development would predominantly be built on agricultural land, and is not anticipated to permanently impact social participation, interaction and support. Any potential temporary impacts would be managed appropriately through direct stakeholder engagement.</p>
	Education and training	<p>Scoped out – although there is potential for education and training opportunities as part of the Development, this would be addressed in Section 4.2 Socio-economics where appropriate and necessary in the ES.</p>
	Employment and income	<p>Scoped in – the construction stage could generate temporary, direct employment opportunities (primarily for construction workers), with associated indirect employment opportunities from supply chain activity (indirect) and local spending on goods and services by employees (induced).</p>

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
		<p>Having a consistent income and being in long-term employment are two of the most important wider determinants of health. As such, the Population and Human Health effects associated with changes in socio-economic factors during the construction stage would be scoped in to the ES to communicate the Population and Human Health benefits associated with this.</p> <p>The Population and Human Health topic would draw from and build on key outputs from Section 4.2 Socio-economics in order to carry out the assessment and reach a conclusion regarding the significance of effect in Population and Human Health terms in the ES.</p>
Bio-physical environment	Climate change mitigation and adaptation	<p>Scoped out – as part of the EIA Regulations, each topic, including the Population and Human Health topic, would consider the implications of climate change on the conclusions reached in the assessment. However, due to the long latency period associated with climate change impacts, the impact on construction stage assessment conclusions are not required to be considered.</p>
	Air quality	<p>Scoped in – the construction stage is anticipated to contribute to local and temporary changes in air quality (dust, PM and NO₂) associated with on-site construction activities and additional traffic movements required for the delivery of construction materials and worker travel to / from the construction site.</p> <p>Embedded mitigation measures would be implemented in order to reduce the generation of dust and release of air pollutants, outlined in a Construction Environmental Management Plan (CEMP), CTMP and Travel Plan. While this is the case, this would be scoped in to the ES to further communicate how known hazards are addressed to prevent any material risk to Population and Human Health.</p> <p>The Population and Human Health topic would draw from and build on key outputs from Section 3.9 Air Quality in order to carry out the assessment and reach a conclusion regarding the significance of effect in Population and Human Health terms in the ES.</p>
	Water quality or availability	<p>Scoped out – changes in water quality and impacts on water supply infrastructure would be assessed within Section 3.3 Flood Risk and Hydrology in the ES. There is no further guidance to consider the relationship between human health and water quality to consider this further than in Section 3.3. As such, no further health assessment is considered necessary.</p>

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Land quality	Scoped out – the potential health impacts from ground conditions (e.g., exposure to contaminated land) would be included as part of the Geology and Land Quality scope (see Section 3.2). There is no further guidance to consider the relationship between human health and water quality to consider this further than in Section 3.2 Geology and Land Quality in the ES. As such, no further health assessment is considered necessary.
	Noise and vibration	Scoped in – the construction stage is anticipated to contribute to local and temporary changes in noise exposure associated with on-site construction activities and additional traffic movements required for the delivery of construction materials and worker travel. Additional noise and vibration changes would be created by the Horizontal Direction Drilling for Onshore Export Cable installations. Embedded mitigation measures, contained in a CEMP, would contribute to a reduction of noise impacts. While this is the case, this would be scoped in to the ES to more effectively communicate the magnitude and distribution of potential impacts, and the resultant significance of effect on Population and Human Health, if any. The Population and Human Health topic would draw from and build on key outputs from Section 3.8 Noise and Vibration in order to carry out the assessment and reach a conclusion regarding the significance of effect in Population and Human Health in the ES.
	Radiation	Scoped out – no significant sources of ionising or non-ionising radiation (e.g., electric and magnetic fields) would be introduced during construction of the Development.
Institutional and built environment	Health and social care services	Scoped in –modelling work would be undertaken as part of the ES on labour need and workforce availability to determine the distribution of construction workforce and which would assume a high proportion of transient workers. The impact of this redistribution of people in the context of existing healthcare capacity locally would be analysed.
	Built environment ¹⁵	Scoped out – construction of the Development would not materially alter existing built features of the neighbourhood environment that contribute to health. Furthermore, the proposed cable route would seek to avoid community infrastructure to prevent the permanent loss of resources and amenities.

¹⁵ How the Development affects the built features of the environment that contribute to health, including opportunities to contribute to local or neighbourhood design that fits positively into the wider spatial planning context to support physical, mental and social wellbeing.

Gwynt Glas Offshore Wind Farm Scoping Report

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Wider societal infrastructure and resources ¹⁶	Scoped out – the Development would not impact wider societal infrastructure and resources (i.e., energy infrastructure) until operational.

4.1.6.2 Potential Impacts During the O&M Stage

1491. **Table 4.1.5** outlines all health determinants listed in ISEP’s Guide to Effective Scoping of Human Health in EIA and provides a rationale for scoping into and / or out of the O&M stage assessment.

Table 4.1.5 Potential impacts on Determinants of Health during the Operation Stage to be scoped in to and / or out of the Population and Human Health assessment

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
Health related behaviours	Physical activity	Scoped out – once operational, onshore elements of the Development would not materially influence access to PRoW or open space for physical activity as land required for construction would be reinstated to its previous use.
	Risk taking behaviour	Scoped out – the workforce associated with the O&M of the Development would remain in-situ during the day, with limited potential for influence risk taking behaviours.
	Diet and nutrition	Scoped out – while the Development would potentially result in the loss of agricultural land in the case of the Onshore Transmission Station(s), this would not have a material impact on access to food, diet or nutrition during operation. This would be addressed by the Land Use Section where appropriate and necessary.
Social environment	Housing	Scoped out – any operational workers are anticipated to be sourced locally. On this basis, there would be no changes expected on housing demand and need.
	Relocation	Scoped out – any requirement for relocation would constitute a permanent construction stage impact.
	Open space, leisure and play	Scoped out – once operational, onshore elements of the Development would not materially influence access to PRoW or open space for leisure and play as land required for construction would be reinstated to its previous use.

¹⁶ How the Development contributes to: energy infrastructure; transport infrastructure; waste management infrastructure; water infrastructure; communication and IT infrastructure; or other infrastructures on which society depends for good population health.

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Transport modes, access and connections	Scoped out – the main traffic movements anticipated during the operational stage of the Development would be associated with staff and maintenance movements. However, it is not anticipated this would lead to a substantial change that would give rise to significant adverse effects on health and wellbeing (i.e. severance, pedestrian and cyclist amenity, fear and intimidation and risk of road traffic accidents / injury). On this basis, it is proposed this be scoped out of the operation stage assessment.
	Community safety	Scoped out – once operational, the Development would not materially influence community safety as publicly accessible land required for construction would be reinstated to its previous use.
	Community identity, culture, resilience and influence	Scoped out – while operation of the Development may impact the visual environment due to the presence of wind turbines and the Onshore Transmission Station(s), attitudes are subjective and would only impact a small proportion of the Onshore Study Area population.
	Social participation, interaction and support	Scoped out – the operational stage of the Development would not impact or deliver any new spaces dedicated to social participation, interaction and support. As such, it is proposed that this is scoped out of the operation stage assessment.
	Education and training	Scoped out – although there is potential for education and training opportunities as part of the Development, this would be addressed by the Socio-economics assessment where appropriate and necessary.
	Employment and income	Scoped in – the Development would generate long-term, direct employment opportunities, with associated employment opportunities from supply chain activity (indirect) and local spending on goods and services by employees (induced). The Population and Human Health topic would draw from and build on key outputs from the Socio-economics section in order to carry out the assessment and reach a conclusion regarding the significance of effect in Population and Human Health terms.
Bio-physical environment	Climate change mitigation and adaptation	Scoped in – as part of the EIA Regulations, the Population and Human Health topic would consider the implications of climate change on the conclusions reached in the assessment. This would consider how the future impacts of climate change might alter the O&M assessment conclusions by building on key outputs from Section 4.4 CCR in the ES.

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
	Air quality	Scoped out – it is anticipated that operation stage traffic would not have a material impact on air quality. In addition, the infrastructure constituting the Development would not generate any emissions. As such, the Population and Human Health effects associated with changes to air quality from the operational development are proposed to be scoped out the ES.
	Water quality or availability	Scoped out – Section 3.3 Flood Risk and Hydrology in the EIA would assess the impacts on water resources including water quality and water supply infrastructure. As such, potential impacts would be dealt within the Flood Risk and Hydrology section, and further Population and Human Health assessment is not considered necessary.
	Land quality	Scoped out – the potential health impacts from ground conditions (e.g., exposure to contaminated land) would be included as part of Section 3.2 Geology and Land Quality scope for ES. No further health assessment is considered necessary.
	Noise and vibration	<p>Scoped in – the Onshore Transmission Station(s) introduced by the Development have the potential to give rise to significance noise and vibration impacts. As such, changes in noise exposure created within the Onshore Transmission Station(s) Zone are proposed to be scoped in to the Population and Human Health assessment and would build on conclusions from Section 3.8 Noise and Vibration in the ES.</p> <p>However, the Development is not expected to create operational traffic movements that give rise to significant noise and vibration impact. As such, changes in noise exposure and vibration levels are not anticipated to have a material adverse impact on Population and Human Health. On this basis, impacts associated with traffic noise and vibration are proposed to be scoped out of the Population and Human Health assessment.</p>
	Radiation	Scoped out – a key aspect of the Development is the 220kV transmission infrastructure, which exceeds the 132kV guideline set out by the IEMA (International Commission on Non-Ionising Radiation Protection). However, based on experience with other projects with transmission infrastructure, it is not anticipated that public exposure to electric and magnetic field risks (EMF) would exceed guidelines set to be protective of human health. Embedded mitigation measures would be implemented into the design, so that cables are set an appropriate distance from any permanent receptor locations. This would ensure EMF are reduced to levels that are inherently protective of human health. Any exposure to non-permanent receptors passing directly by the cables would be temporary and transient and therefore would not present a risk to public health. On this basis, it is proposed that radiation risks are proposed to be scoped out of the Population and Human Health assessment.

CATEGORY	DETERMINANT OF HEALTH	JUSTIFICATION
Institutional and built environment	Health and social care services	Scoped out – the operational stage workforce of the Development are expected to commute on a daily basis, with existing housing provision sufficient for the future operational workforce. As such, there would be no material impact on access to health and social care services.
	Built environment	Scoped out – the operational Development would not alter existing built features of the neighbourhood environment that contribute to health.
	Wider societal infrastructure and resources	Scoped out – the Development would contribute to energy infrastructure development and a low carbon economy. However, these impacts would be dealt with in the relevant topic sections, and it is not considered necessary to provide additional analysis from a Population and Human Health perspective.

4.1.6.3 Potential Impacts During the Decommissioning Stage

1492. The potential Population and Human Health impacts associated with the decommissioning stage of the Development are expected to be similar to those identified for the construction stage.
1493. **Table 4.1.4** provides the rationale for informing which health determinants are proposed to be **scoped in** to and / or **out** of the decommissioning stage.

4.1.6.4 Potential Inter-relationship Impacts

1494. The impact assessment would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts on Human Health and Population assets are **scoped in** to the EIA.

4.1.6.5 Potential Cumulative Impact

1495. With regards to cumulative effects, the health determinants proposed to be **scoped in** to the EIA would be reconsidered in the context of all committed nearby developments. Each health determinant would have a different ZoI, which would be determined by the inter-related technical disciplines which inform the Population and Human Health assessment.

4.1.6.6 Potential Transboundary Impacts

1496. It is not relevant to assess transboundary effects relating to Population and Human Health, as the assessment focusses on the effects of Development receptors only. Therefore, transboundary effects are **scoped out** of the EIA.

4.1.6.7 Summary of Impacts

1497. **Table 4.1.6** summarises which health determinants are proposed to be **scoped in** and **out** of the EIA.

Gwynt Glas Offshore Wind Farm Scoping Report

Table 4.1.6 Summary of Impacts Proposed to be Scoped In (✓) and Out (X) for Population and Human Health

DETERMINANTS OF HEALTH	CONSTRUCTION	O&M	DECOMMISSIONING
Physical activity	✓	x	✓
Risk taking behaviour	✓	x	✓
Diet and nutrition	x	x	x
Housing	✓	x	✓
Relocation	x	x	x
Open space, leisure and play	✓	x	✓
Transport modes, access and connections	✓	x	✓
Community safety	x	x	x
Community identity, culture, resilience and influence	x	x	x
Social participation, interaction and support	x	x	x
Education and training	x	x	x
Employment and income	✓	✓	✓
Climate change mitigation and adaptation	x	✓	x
Air quality	✓	x	✓
Water quality or availability	x	x	x
Land quality	x	x	x
Noise and vibration	✓	✓	✓

DETERMINANTS OF HEALTH	CONSTRUCTION	O&M	DECOMMISSIONING
Radiation	x	x	x
Health and social care services	✓	x	✓
Built environment	x	x	x
Wider societal infrastructure and resources	x	x	x
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	x	x	x

4.1.7 Potential Mitigation Measures

1498. A number of embedded mitigation measures relevant to the Population and Human Health assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
1499. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to Population and Human Health impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**. The assessment of impacts would be made with these embedded mitigation measures in place.
1500. Requirements for any additional mitigation measures would be determined through the EIA.
1501. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

4.2 Socio-economics

1502. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Socio-economics.
1503. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Socio-economic receptors in the Development's ES.
1504. The Socio-economic assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:
- **Section 1.5 Project Description;**
 - **Section 2.6 Commercial Fisheries;**
 - **Section 2.7 Shipping and Navigation;**
 - **Section 3.4 Land Use;**
 - **Section 3.6 LVIA;**
 - **Section 3.7 Traffic and Transport;**
 - **Section 3.8 Noise and Vibration;**
 - **Section 3.9 Air Quality;** and
 - **Section 4.1 Population and Human Health.**

The following questions are posed to consultees to help them frame and focus their response to the Socio-economics scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Socio-economic Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on Socio-economics resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

4.2.1 Study Area

1505. The Socio-economic Study Area is defined using a set of principles commonly applied to UK OWF projects:
- Principle 1 (Dual Geographies) - The local area for the supply chain and investment impacts should be separate from the local area(s) for wider socio-economic impacts;
 - Principle 2 (Appropriate Impacts) - The appropriate impacts to be considered for assessments should be identified before defining the local areas;
 - Principle 3 (Epicentres) - The local areas should include all the epicentres of the appropriate impacts;
 - Principle 4 (Accountability) - The local areas used in the assessment should comprise of pre-existing economic or political geographies (community councils, local authorities, development agencies) to enhance accountability;
 - Principle 5 (Understandable) - The local areas should be defined in such a way that they are understandable to the communities they describe; and
 - Principle 6 (Connected Geography) - The local area for the supply chain and investment impacts should consist of connected (including coastal) pre-existing economic or political geographies.
1506. The exact location of the ports that would be used during the construction and operation have not been decided at this time. As such, an aggregated study area has been constructed containing ports anticipated to be used in Wales and the south-west. This area would be refined if decisions are made prior to the Socio-economic EIA.
1507. To ensure that the geographies for the Socio-economic impact assessment are accountable and understandable, local authorities have been used as the building blocks of the economic and demographic study areas.
1508. The Socio-economic Study Area is the smallest area that would include all likely epicentres of impact, defined as the south-west region of England and south Wales, which includes the following local authorities as shown on **Plate 4.2.1**:
- Bath and north-east Somerset;
 - Bournemouth, Christchurch and Poole;
 - City of Bristol;
 - Cornwall;
 - Devon;
 - Dorset;
 - Gloucestershire;
 - Isles of Scilly;
 - North Somerset;
 - Plymouth;
 - Somerset;

Gwynt Glas Offshore Wind Farm Scoping Report

- South Gloucestershire;
- Swindon;
- Torbay;
- Wiltshire;
- Blaenau Gwent;
- Bridgend;
- Caerphilly;
- Cardiff;
- Carmarthenshire;
- Merthyr Tydfil;
- Monmouthshire;
- Neath Port Talbot;
- Newport;
- Pembrokeshire;
- Rhondda Cynon Taf;
- Swansea;
- Torfaen; and
- Vale of Glamorgan.

1509. The economic impacts would be assessed at the Socio-economic Study Area and UK levels.



Plate 4.2.1 Socio-economic Study Area

4.2.2 Baseline Environment

4.2.2.1 Socio-Economic Study Area

1510. The Socio-economic Study Area has a population of 8,171,500 people. Of this population, 61.0% are aged between 16 and 64 (compared to the UK average of 62.8%) (Office for National Statistics (ONS), 2025e).
1511. The share of the working age population that is economically active is 80.0% in the Socio-economic Study Area, and 3.8% are unemployed (compared to the UK average of 78.9% and 3.8%) (ONS, 2025d).
1512. Professional and technical occupations (including professional occupations and associated professional and technical occupations) account for 40.9% of employment in the Socio-economic Study Area, compared to 41.8% across the UK (ONS 2025).
1513. The biggest employment sectors in the Socio-economic Study Area are wholesale and retail trade, which accounts for 14.7% of the workforce, human health and social work activities (14.0%) and education (9.5%).

4.2.3 Data Sources

1514. **Table 4.2.1** outlines existing primary data that has been used to inform this section and would also be used to inform the EIA.

Table 4.2.1 Data Sources to Inform the Socio-economic Assessment

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
ONS (2025d) Business Register and Employment Survey.	UK, Wales and local authorities	2024
ONS (2024) Population estimates – local authority based by single year of age.	UK, Wales and local authorities	2024
ONS (2025e) Annual Population Survey.	UK, Wales and local authorities	12 months to September 2025
ONS (2025a) Annual Survey of Hours and Earnings – resident analysis.	UK, Wales and local authorities	2025
ONS (2025b) Housing affordability in England and Wales: 2024.	England, Wales and local authorities	2025
ONS (2025c) National population projections: 2022 -based.	UK and Wales	2022
UK Government (2025) Education and Training Statistics for the UK.	UK, Wales and selected regional areas	2025

DATASET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Welsh Government (2021) 2018-based local authority population projections for Wales, 2018 to 2043.	Wales and local authorities	2018
Welsh Government (2025c) Dwelling Stock by Tenure.	Wales and local authorities	2024
Welsh Government (2025d) Patients Registered at a GP Practice.	Wales and local authorities	2025

1515. No site-specific surveys are proposed to be undertaken as part of the Socio-economic assessment.

1516. Other data and information available to inform the EIA includes, but is not limited to:

- Offshore Renewable Energy Catapult (2021). Offshore Wind O&M;
- Offshore Wind Industry Council (OWIC) (2025) Wind Industry Skills Intelligence Report;
- Welsh Government (2023) Stronger, fairer, greener Wales: net-zero skills; and
- Welsh Government (2025e) Energy Generation in Wales 2023.

4.2.4 Approach to Impact Assessment

4.2.4.1 Economic Impacts

1517. The economic impacts which would be considered would be reported in terms of:

- Gross Value Added (GVA) - this is a measure of economic value added by an organisation or industry and is typically estimated by subtracting the non-staff operational costs from the revenues of an organisation;
- Years of Employment - this is a measure of employment which is equivalent to one person being employed for an entire year and is typically used when considering short term employment impacts, such as those associated with the construction stage of the Development; and
- Jobs - this is a measure of employment which considers the headcount employment in an organisation or industry. This measure is used when considering long term impacts such as the jobs supported during the O&M stage of a Development.

1518. The economic impacts associated with the supply chain would be assessed in line with the approach considered in the UK Offshore Wind Sector Deal (UK Government 2020). The focus of the assessments would be the direct and indirect (supply chain) effects. In addition to this, this assessment shall also consider the effects of staff spending and the economic impact that this subsequent increase in demand stimulates (the induced effect).

1519. It is acknowledged that at the time of writing, the exact levels of expenditure are unknown by the Applicant. This expenditure is what shall drive the positive economic impacts. The socio-economic assessment would therefore consider the worst case scenario of the lowest, realistic levels of expenditure associated with the Development. This value may change between the production of

the EIA and the construction of the Development to reflect any agreements reached between the Applicant and potential suppliers and any changes in the market that may impact prices.

1520. The analysis would cover the three stages of the Development, namely:

- Construction;
- O&M; and
- Decommissioning.

1521. The impacts during the construction stage would be a result of the expenditure required to successfully deliver this stage of the Development. In addition to the total impact over this stage, the assessment would also consider the timings of impacts to understand the peaks and troughs of the construction activity.

1522. The impacts during the O&M stage for the Development would be a result of the projected operational expenditure required to deliver this stage of the Development.

1523. It is assumed that the impacts during decommissioning would be similar, but of smaller magnitude, to those anticipated during the construction stage. The scale of the impact during the decommissioning stage is anticipated to be approximately one third of those experienced during construction, indicative of the level of expenditure associated with each stage of the Development (BVG Associates, 2023). In instances where the lifetime impact is considered, and impacts are expected to occur over a number of years, a discount rate would be applied. This allows impacts that occur sooner to be valued more highly than impacts that occur in the future, a concept known as time preference. In this instance, a discount rate of 3.5% would be chosen, which is in line with the UK Government's Green Book (UK Government 2026).

4.2.4.2 Social Impacts

1524. The social impacts assessment would follow on from the economic impact assessment, which would identify the resulting peak employment of the construction, O&M, and decommissioning stage of the Development. The social impact assessment would consider the worst case scenario in which a high proportion of the workforce would be transient.

1525. The assessment would then consider the capacity of the socio-economic study area and the UK, and the service provision within these economies to accommodate the increase in population during each stage of the Development. In particular, it would consider:

- The likely demand for accommodation and the ability of the market to meet this demand; and
- The demand for services such as health and education, and the ability of the local providers to meet this demand.

1526. The change in demand as a result of the Development would be assessed against the baseline demand for these services in the study areas. This would allow the magnitude of impact and sensitivity of each receptor to be identified. The significance of each impact would then be assessed in line with the general approach outlined in **Section 1.8 EIA Methodology**.

1527. The impact on community infrastructure as a result of environmental factors, such as noise or transport, shall be considered within the relevant topic EIA sections.

1528. The assessment would only consider the change in demographics due to transient labour or permanent migration during the construction stage, as the activity during the O&M, and decommissioning stages would be of a smaller magnitude.

4.2.4.3 Receptors

1529. The following receptors may be sensitive to changes in employment, GVA, and demographics:

- Socio-economic Study Area; and
- UK economy.

4.2.5 Potential Impacts

4.2.5.1 Potential Impacts During the Construction Stage

1530. The construction of OWF projects can have beneficial socio-economic effects in terms of providing employment and continuing to develop and support the UK wind energy supply chain.

1531. The EIA would consider the direct economic benefits of the supply chain expenditure required to deliver this stage of the Development spent in businesses in the Socio-economic Study Area and the UK.

1532. Increased employment, as well as potential changes to demographics due to national migration and immigration, would be assessed. The skill level and occupational splits of the employment opportunities would be put in the context of the local area to identify overlaps, gaps and opportunities.

1533. Impacts on onshore and offshore activities which contribute to the existing social and economic characteristics of the Socio-economic Study Area would also be considered and assessed. This may include disturbance as a result of potential air quality, noise, visual and traffic impacts on social infrastructure, where these might arise at a material scale.

1534. As such the following potential construction related impacts are **scoped in** to the EIA:

- Direct economic benefit (supply chain);
- Increased employment;
- Increased skills and training;
- Change in demographics due to immigration;
- Loss of, disruption to or pressure on local infrastructure and services;
- Impacts to Welsh language; and
- Disturbance (noise, air, visual and traffic) to social infrastructure including the Welsh language and culture.

4.2.5.2 Potential Impacts During the O&M Stage

1535. The impacts assessed for the O&M stage of the Development would be as described above for construction. However, it is anticipated that any impacts on the local economy would be most significant during the construction stage, with fewer impacts being predicted on the local economy during the O&M stage.

1536. The impact of economic benefits, increased employment and changes in demographic due to immigration during O&M are **scoped in** to the EIA.
1537. If significant effects are identified on other sectors in other sections of the EIA, such as **Commercial Fisheries** and **Tourism and Recreation**, these would be quantified and included in the socio-economic impact assessment as part of the net economic effects.
1538. The impacts associated with the loss of, disruption to or pressure on local services and offshore activities, disturbance to social infrastructure and impacts to the Welsh language during O&M would be negligible and are therefore **scoped out** of the EIA.
- 4.2.5.3 Potential Impacts During the Decommissioning Stage
1539. Impacts during decommissioning are expected to be similar, but of smaller magnitude, to those anticipated during construction.
1540. The same potential impacts noted for construction are therefore **scoped in** for decommissioning.
- 4.2.5.4 Potential Inter-relationship Impacts
1541. The EIA would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts are **scoped in** to the EIA.
- 4.2.5.5 Potential Cumulative Impacts
1542. Cumulative impacts would be considered as set out in **Section 1.8 EIA Methodology**. Potential cumulative impacts related to Socio-economics include cumulative effects with other offshore wind development in the region to potentially boost the local skill base. Conversely, there is also potential to cumulatively impact other industries negatively as a result of the displacement of workers currently employed in other industries. It is therefore proposed that cumulative impacts are **scoped in** to the EIA.
- 4.2.5.6 Potential Transboundary Impacts
1543. The transboundary impacts assessment considers the potential for socio-economic effects to occur outside of the UK as a result of activities associated with the construction, O&M, and decommissioning of the Development.
1544. The impacts associated with spending on imports from outside of the UK are expected to be positive and negligible and are therefore **scoped out** of the EIA.
- 4.2.5.7 Summary of Potential Impacts
1545. **Table 4.2.2** outlines the impacts which are proposed to be **scoped in (✓)** and / or **out (x)** of the EIA. This may be refined as additional information and data become available.

Table 4.2.2 Summary of Impacts Proposed to be Scoped In (✓) and Out (x) of the Socio-economic Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Direct economic benefit (supply chain)	✓	✓	✓
Increased employment	✓	✓	✓
Increased skills and training	✓	✓	✓
Change in demographics due to transient labour or permanent migration	✓	✓	✓
Loss of, disruption to, or pressure on local infrastructure and services	✓	x	✓
Impacts to Welsh language	✓	x	✓
Disturbance (noise, air, visual and traffic) to social infrastructure	✓	x	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	x	x	x

4.2.6 Potential Mitigation Measures

1546. A number of embedded mitigation measures relevant to the Socio-economic assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.

1547. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to Socio-economic impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.

1548. As part of the development and design process, the Applicant has identified measures to mitigate against adverse socio-economic effects and to enhance any beneficial effects, in particular those associated with the supply chain. These are outlined below.

4.2.6.1 Supply Chain Enhancement Measures

1549. As part of the Celtic Sea LR5, the Applicant provided a comprehensive Supply Chain Investment Plan which outlines their anticipated level of supply chain content to be secured within Wales and the UK. To enhance the beneficial effects associated with the supply chain, the Applicant placed a strong focus on supply chain engagement and skills development to build the capacity.

- 1550. The Crown Estate placed a strong emphasis on social value as part of the Celtic Sea LR5, requiring the Applicant to submit plans for creating new opportunities for jobs, economic regeneration, and working with ports. Additional mitigation measures are therefore likely to focus on additional steps the Applicant could take to enhance the positive effects of the Development.
- 1551. The Applicant would also develop an Outline Skills and Employment Strategy to be submitted with the DCO and ML application. The Strategy would be drafted to consider the Applicant's wider social value obligations and commitments, including those set out within the AfL and, ultimately, the Lease(s). It would provide an initial framework that can be developed further in collaboration with relevant key consultees into a Skills and Employment Strategy, facilitating positive and meaningful commitments and activities across the south-west of England and south Wales region.
- 1552. Requirements for any additional mitigation measures would be determined through the EIA.
- 1553. Mitigation measures would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.




4.3 Tourism and Recreation

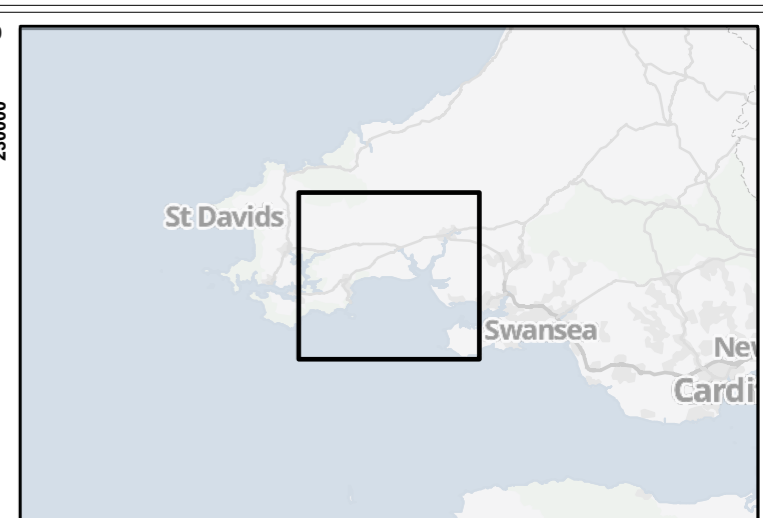
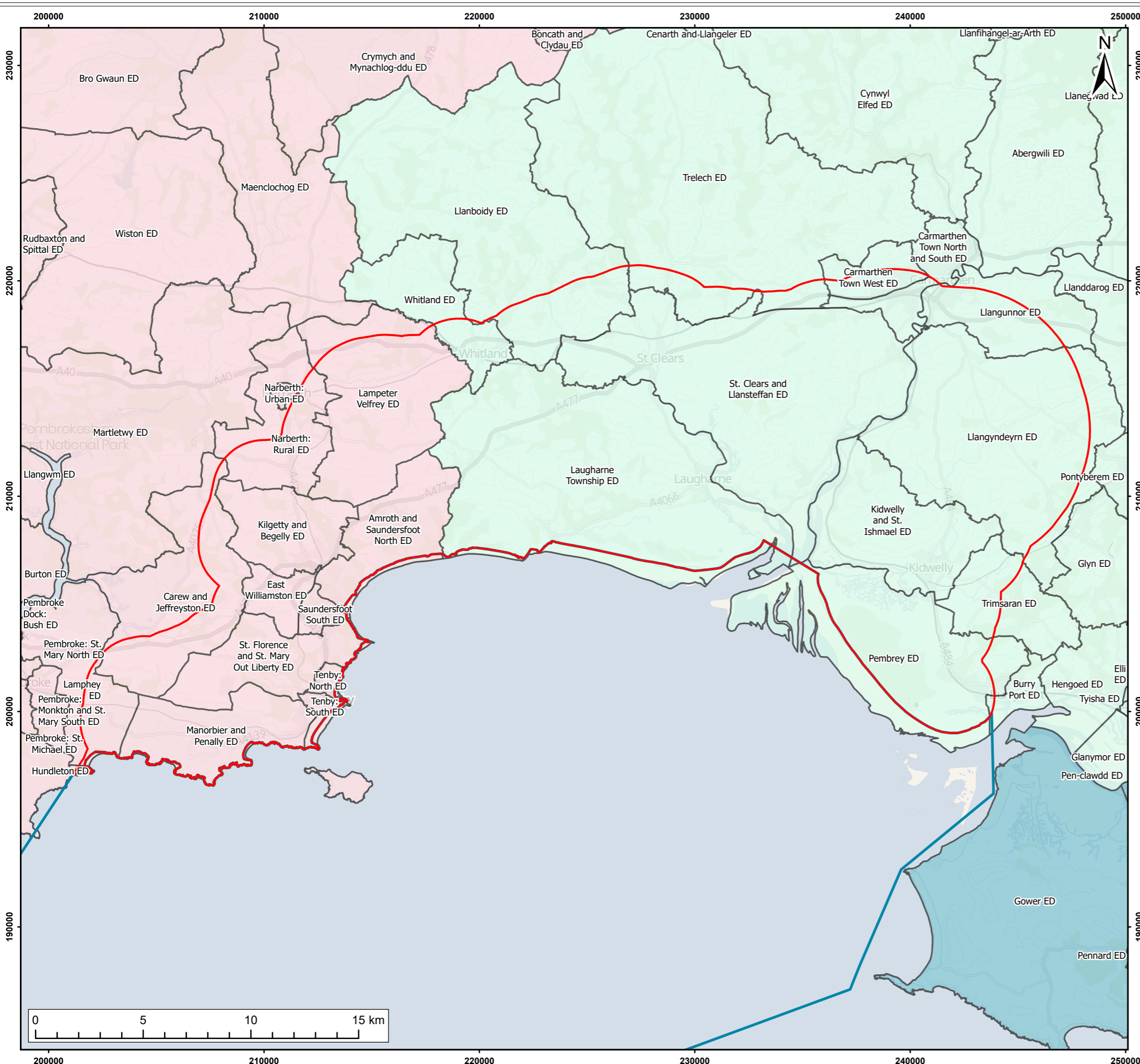
1554. This section of the Scoping Report considers the scope of potential impacts of the construction, O&M, and decommissioning stages of the Development on Tourism and Recreation.
1555. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on Tourism and Recreation receptors in the Development's ES.
1556. The Tourism and Recreation assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the ES:
- **Section 1.5 Project Description;**
 - **Section 2.7 Shipping and Navigation;**
 - **Section 2.9 Other Infrastructure and Users;**
 - **Section 2.10 Offshore Archaeology and Cultural Heritage;**
 - **Section 3.4 Land Use;**
 - **Section 3.6 LVIA;**
 - **Section 3.7 Traffic and Transport;**
 - **Section 3.8 Noise and Vibration;**
 - **Section 3.9 Air Quality;** and
 - **Section 4.2 Socio-economics.**

The following questions are posed to consultees to help them frame and focus their response to the Tourism and Recreation scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed Tourism and Recreation study area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on the Tourism and Recreation resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

4.3.1 Study Area

1557. The Tourism and Recreation Study Area is the area for the assessment of potential disturbance to the tourism industry and recreational activities. It would consist of an Onshore Study Area, an Offshore Study Area and a Direct Assessment Area.
1558. For the purposes of scoping, the Tourism and Recreation Study Area consists of the Onshore Scoping Boundary, as shown in **Figure 4.3.1**. The Tourism and Recreation Study Area in the EIA would be refined to the Onshore Development Area once the locations of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are selected.
1559. The Onshore Study Area for the assessment of impacts on the tourism economy in the EIA would include all tourism markets that are within the Onshore Development Area, defined as the boundary within which all onshore infrastructure required for the Development would be located.
1560. To ensure the Onshore Study Area accounts for geographies that are familiar and relatable to the communities living within them, it has been defined using local authorities. The Onshore Study Area therefore comprises of the following local authorities which are within the Onshore Scoping Boundary, as shown on **Figure 4.3.1**:
-  Carmarthenshire;
 -  Pembrokeshire; and
 -  Swansea.
1561. As the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall site selection process progresses beyond scoping, the Onshore Development Area is likely to reduce in size.
1562. All onshore Tourism and Recreation receptors considered in this scoping section are located in the Onshore Scoping Boundary. However, to ensure a targeted assessment for the EIA, the analysis would focus on those receptors within 1km of the Onshore Export Cable Corridor and 5km from the Onshore Transmission Station(s) Zone, once these locations are identified for the EIA. This is based on the anticipated range of other environmental effects which are likely to impact on sensitive Tourism and Recreation receptors, such as noise and visual impacts. Where traffic impacts have a bearing on Tourism and Recreation receptors outside this buffer, they have also been included in the analysis. This is the Direct Assessment Area for the EIA.
1563. The Tourism and Recreation Study Area would also consider the area used for offshore recreational activities, including recreational angling and wildlife tours, within the Offshore Study Area as defined in **Section 2.9 Infrastructure and Other Users**.
1564. The Tourism and Recreation Study Area for the EIA would therefore consist of an Onshore Study Area, a Direct Assessment Area and an Offshore Study Area. This would be identified for the EIA once the Onshore and Offshore Development Areas have been identified.



Legend:

- Onshore Scoping Boundary / Tourism and Recreation Study Area
- Offshore Export Cable Scoping Boundary

Local Authority

- Swansea
- Pembrokeshire
- Carmarthenshire

Source: © Haskoning UK Ltd, 2026
 Base map: Contains OS data © Crown Copyright and database right 2026. Contains data from OS Zoomstack

Project:
Gwynt Glas Offshore Wind Farm Scoping Report

Title:
Tourism and Recreation Study Area and Local Authorities

Figure: 4.3.1 Drawing No: PC6850-HAS-ZZ-ON-DR-GS-0101

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	07/04/2026	GC	KD	A3	1:175,000

Co-ordinate system: OSGB 1936 British National Grid




4.3.2 Baseline Environment

4.3.2.1 Tourism and Recreation Study Area

1565. The tourism baseline would include the local Tourism and Recreation assets, accommodation providers, recreational trails and core paths (including the Wales Coast Path) within the Tourism and Recreation Study Area.

4.3.3 Data Sources

1566. **Table 4.3.1** outlines existing primary data that has been used to inform this section. The EIA would also be informed by, but not limited to, these data sources.

Table 4.3.1 Data Sources to Inform the Tourism and Recreation Assessment

DATA SET	SPATIAL COVERAGE	SURVEY YEAR / TIMINGS
Kantar TNS (2025a) Great Britain (GB) Day Visitor 2024 report.	UK, Wales and selected regions	2024
Kantar TNS (2025b) GB Tourist 2024 report, domestic overnight trips.	UK, Wales and selected regions	2024
Visit Britain (2025) Annual Inbound Update GB Nations and Regions.	UK, Wales and selected regions	2025
ONS (2025a) Business Register and Employment Survey.	UK, Wales and local authorities	2024
Welsh Government (2024) Resident Survey Pilon: Gwynedd, Pembrokeshire, and Vale of Glamorgan.	Selected Welsh local authorities	2024
Welsh Government (2025f) Domestic GB Tourism Statistics (overnight trips in Wales): 2024.	Wales	2024

1567. The existing tourism data available is sufficient for the tourism assessment, and therefore, no site-specific surveys are proposed to be undertaken as part of the Tourism and Recreation assessment.

4.3.4 Approach to Impact Assessment

1568. There is no formal legislation or guidance on the methods that should be used to assess the effects that wind farm developments may have on tourism. The link between energy infrastructure and the tourism sector is a well-researched subject. BiGGAR Economics' most recent research found no pattern or evidence suggesting any link between the performance of the general tourism economy and wind farm developments (BiGGAR Economics 2021). Similarly, a study carried out by ERM and Ipsos MORI on behalf of National Grid found that the majority of businesses and recreational users did not perceive there to be an impact from National Grid projects on either their own business or their personal behaviour (ERM and Ipsos MORI, 2014).

1569. The tourism and recreation assessment shall consider the key drivers of tourism in the Tourism and Recreation Study Area, and consider how the Development would affect these drivers.
1570. The assessment would consider the significant effects identified in **Section 3.7 Traffic and Transport, Section 3.4 Land Use, Section 3.8 Noise and Vibration, and Section 2.11 SLVIA and Section 3.6 LVIA** on specific Tourism and Recreation assets, accommodation providers, and recreational trails and core paths, within the Tourism and Recreation Study Area. The assessment of the magnitude of the impacts, both positive and negative, would build on the evidence available on behaviour changes as a result of similar developments.
1571. The assessment of marine recreational boating, sailing and recreational fishing would also comply with the following guidance documents where they are specific to this topic:
- Welsh Government (2020);
 - WNMP Implementation Guidance; and
 - The Planning Inspectorate's advice notes.
- 4.3.4.1 Receptors
1572. The following receptors may be sensitive to significant effects identified in **Section 2.9 Infrastructure and Other Users, Section 3.7 Traffic and Transport, Section 3.4 Land Use, Section 3.8 Noise and Vibration, and Section 2.11 SLVIA and Section 3.6 LVIA**.
1573. Receptors would be categorised as:
- Tourism and Recreation assets within the Onshore Study Area and Offshore Study Area;
 - Accommodation providers within the Onshore Study Area; and
 - Recreational trails and core paths within the Onshore Study Area.
- 4.3.5 Potential Impacts
- 4.3.5.1 Potential Impacts During the Construction Stage
1574. The construction of OWF projects can have potential adverse impacts on Tourism and Recreation receptors unless they are identified and mitigation measures are applied.
1575. As such the following potential construction related impacts are **scoped in** to the EIA:
- Disruption to recreational activities onshore and offshore; and
 - Disruption to the tourism industry onshore and offshore.
- 4.3.5.2 Potential Impacts During the O&M Stage
1576. It is anticipated that any impacts to tourism and recreation would be most significant during the construction stage, with fewer impacts being predicted during the O&M stage due to the nature of the buried Onshore Export Cable and activity associated with the Offshore Export Cable being lower. The Onshore Transmission Station(s) are likely to be located at a relative distance from sensitive receptors.
1577. The impacts associated with Tourism and Recreation during O&M would be negligible and are therefore **scoped out** of the EIA.

4.3.5.3 Potential Impacts During the Decommissioning Stage

1578. Impacts during decommissioning are expected to be similar, but of smaller magnitude, to those anticipated during construction.
1579. The same potential impacts noted for construction are therefore expected to be **scoped in** for decommissioning.

4.3.5.4 Potential Inter-relationship Impacts

1580. The EIA would consider the inter-relationship of impacts on individual receptors in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where the accumulation of residual impacts on a single receptor and the relationship between those impacts, gives rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts are **scoped in** to the EIA.

4.3.5.5 Potential Cumulative Impacts

1581. The assessment would consider the significant cumulative effects identified in **Section 2.9 Infrastructure and Other Users, Section 3.7 Traffic and Transport, Section 3.4 Land Use, Section 3.8 Noise and Vibration**, and **Section 2.11 SLVIA** and **Section 3.6 LVIA** on specific Tourism and Recreation assets, accommodation providers, and recreational trails and core paths in the Tourism and Recreation Study Area.
1582. It is not anticipated that any significant cumulative effects on Tourism and Recreation receptors would be identified in **Section 2.9 Infrastructure and Other Users, Section 3.7 Traffic and Transport, Section 3.4 Land Use, Section 3.8 Noise and Vibration**, and **Section 2.11 SLVIA** and **Section 3.6 LVIA**. The cumulative impacts associated with Tourism and Recreation during O&M would therefore be negligible and **scoped out** of the EIA but cumulative impacts associated with Tourism and Recreation during construction would be **scoped in** to the EIA.
1583. Impacts during decommissioning are expected to be similar to those identified during the construction stage and therefore **scoped in** to the EIA.

4.3.5.6 Potential Transboundary Impacts

1584. The transboundary impacts assessment considers the potential for Tourism and Recreation effects to occur outside of the UK as a result of activities associated with the construction, O&M, and decommissioning of the Development.
1585. The impacts on Tourism and Recreation assets, accommodation providers, and recreational trails and core paths outside of the Tourism and Recreation Study Area are expected to be negligible and are therefore **scoped out** of the EIA.

4.3.5.7 Summary of Potential Impacts

1586. **Table 4.3.2** outlines the impacts which are proposed to be **scoped in** (✓) and / or **out** (x) of the EIA. This may be refined as additional information and data become available.

Table 4.3.2 Summary of Impacts Proposed to be Scoped In (✓) and Out (x) of the Tourism and Recreation Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Disruption to recreational activities	✓	x	✓
Disruption to the tourism industry	✓	x	✓
Inter-relationship Impacts	✓	x	✓
Cumulative Impacts	✓	x	✓
Transboundary Impacts	x	x	x

4.3.6 Potential Mitigation Measures

1587. A number of embedded mitigation measures relevant to the Tourism and Recreation assessment, which are proposed to be incorporated into the design of the Development or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.
1588. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to tourism and recreation impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.
1589. Requirements for any additional mitigation measures would be determined through the EIA.
1590. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

4.4 Climate Change Resilience

1591. Climate change was included as a required EIA topic in the EIA Directive 2014/52/EU, which was transposed into UK Infrastructure Planning (EIA) Regulations in 2017. Consideration of climate change in EIA comprises two separate assessments, the Greenhouse Gas (GHG) assessment and the CCR assessment, to determine the Development’s impacts on climate change and the impacts of climate change on the Development respectively. This section describes the proposed scope of work for the CCR assessment. The scoping exercise for the GHG emissions assessment is presented in **Section 4.5 Greenhouse Gas Emissions**.
1592. This section of the Scoping Report considers the scope of potential impacts of climate change on the construction, O&M, and decommissioning stages of the Development through a CCRA.
1593. The Development may be exposed to a range of climate hazards, defined as extreme weather events and chronic climatic changes which have the potential to harm human, environmental or infrastructure receptors. Exposure to climate hazards may lead to climate change impacts on the Development’s receptors i.e. infrastructure and associated activities. The nature of the climate change impact would depend on the type of climate hazard and receptor, but may include impacts such as physical damage, loss or deterioration of infrastructure and other assets, disruptions to activities resulting in delays, decline in performance of infrastructure and other assets, adverse working conditions posing health and safety risks, and cost implications.
1594. Therefore, the purpose of the CCRA is to identify and evaluate the vulnerability of the Development and its associated activities to the projected effects of climate change during the construction, O&M, and decommissioning stages. Unlike other scoping sections (and future EIA sections), this section does not aim to determine the significance of impacts in terms of magnitude. Instead, it focuses on identifying potential climate-related risks, assessing their implications, and recommending appropriate measures to reduce these risks and enhance the overall resilience of the Development to a changing climate.
1595. For the purpose of the CCRA, the following key terms (in line with terminology used in CCRA Framework for Public Services Boards (NRW, 2023c)) would be adopted:
- Climate Resilience: Climate resilience refers to the ability of a system, community, or asset to anticipate, prepare for, respond to, and recover from significant climate-related threats with minimal damage to social well-being, the economy, and the environment.
 - Receptor: An entity or system with potential to be affected by climate hazards and therefore which is vulnerable to experiencing climate change impacts, such as infrastructure (turbines affected by extreme weather conditions like high winds and storms; operational disruptions) and site personnel (personnel working on the Development face risks such as increased frequency and intensity of storms and heatwaves).
 - Climate variable: A measurable, monitorable aspect of the weather or climate conditions such as temperature and wind speed.
 - Climate hazard (hereafter referred as hazard): A climate or weather-related event or trend in climate conditions, which has potential to do harm to receptors such as increased precipitation or storms.
 - Acute Hazard: Acute hazards are sudden-onset, event-driven and high-intensity incidents that arise from extreme weather events, such as floods, wildfires, cyclones or heatwaves,

which occur rapidly and can cause immediate and severe impacts on assets, people and operations.

- **Chronic Hazard:** Chronic hazards are longer-term, slow-onset weather-related changes resulting from gradual shifts in climate patterns, such as sustained temperature increases, rising sea levels, or long-term changes in precipitation, which can progressively erode the performance, resilience and viability of systems, assets and environments over time.
- **Climate change impact:** The resulting impact from a climate hazard which affects the ability of the receptor to achieve or maintain its functions or purpose.
- **Risk:** The potential for adverse consequences resulting from the interaction of climate Hazards with exposed and vulnerable systems.

$$\text{Risk} = \text{Hazard} \times \text{Exposure} \times \text{Vulnerability}$$

- **Exposure:** The presence of people, assets, systems, or services in locations that could be affected by climate hazards.
- **Vulnerability:** The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Adaptive Capacity}$$

- **Sensitivity:** The degree to which a receptor is affected when it experiences a climate hazard.
- **Adaptive Capacity:** The ability of a system, organisation, or asset to adjust to climate impacts, reduce damage, and recover effectively.

1596. The CCR assessment is likely to have key inter-relationships with the following topics, which would be considered appropriately where relevant in the EIA:

- **Section 1.5 Project Description;**
- **Section 2.1 Marine Physical Environment;**
- **Section 2.3 Fish and Shellfish Ecology;**
- **Section 2.6 Commercial Fisheries;**
- **Section 2.7 Shipping and Navigation;**
- **Section 2.9 Infrastructure and Other Users;**
- **Section 3.2 Geology and Land Quality;**
- **Section 3.3 Flood Risk and Hydrology;**
- **Section 4.1 Population and Human Health; and**
- **Section 4.3 Tourism and Recreation**

1597. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects of climate change on the Development's receptors in the Development's ES.

The following questions are posed to consultees to help them frame and focus their response to the CCR scoping exercise which would in turn inform the Scoping Opinion:

- Do you agree with the proposed CCR study area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on the Development resulting from Climate Change been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

4.4.1 Study Area

1598. The spatial scope of the assessment reflects the status of the Development design and consenting process. Given that the locations of the Onshore Transmission Station(s), Onshore Export Cable Corridor and Landfall are not yet confirmed, this topic section considers both the Offshore and Onshore Scoping Boundaries, including search areas for infrastructure, as shown by the Development Scoping Boundaries on **Figure 1.1.1**. The temporal boundary of the CCRA would be defined by the stages of the Development. A combined assessment of the construction, O&M and decommissioning stages of the Development activities is also provided. This approach would provide a comprehensive assessment of the Development for its full life cycle.

4.4.2 Baseline Environment

1599. Existing climate data for the 1991 to 2020 period has also been obtained from the Tenby and Pembrey Sands meteorological recording stations, which are in close proximity to the CCR Study Area. Climate data for the Tenby station, England and the UK are provided in **Table 4.4.1** and for Pembrey Sands in **Table 4.4.2**.

Gwynt Glas Offshore Wind Farm Scoping Report

Table 4.4.1 Location-Specific Long-Term Averages for Tenby (min 2020a)

CLIMATE VARIABLE	STATION: TENBY	DISTRICT: ENGLAND SW AND WALES S	REGION: WALES	UK
Maximum temperature (°C)	13.9	13.7	12.9	12.8
Minimum temperature (°C)	7.5	6.5	5.9	5.5
Days of air frost (days)	25.0	37.2	44.9	53.4
Sunshine (hours)	1666.1	1530.7	1407.5	1402.6
Rainfall (mm)	1136.0	1277.4	1464.8	1162.7
Days of rainfall >1 mm (days)	153.8	160.4	173.1	159.1
Monthly mean wind speed at 10 m (m/s)	-	4.8	5.0	4.8

Table 4.4.2 Location-Specific Long-Term Averages for Pembrey Sands (Met Office 2020b)

CLIMATE VARIABLE	STATION: PEMBREY SANDS	DISTRICT: ENGLAND SW AND WALES S	REGION: WALES	UK
Maximum temperature (°C)	13.9	13.7	12.9	12.8
Minimum temperature (°C)	7.1	6.5	5.9	5.5
Days of air frost (days)	41	37.2	44.9	53.4
Sunshine (hours)	-	1530.7	1407.5	1402.6
Rainfall (mm)	1102.5	1277.4	1464.8	1162.7
Days of rainfall >1 mm (days)	157.3	160.4	173.1	159.1
Monthly mean wind speed at 10 m (m/s)	6.2	4.8	5.0	4.8

4.4.2.1 Impact of Climate Change on the Baseline Environment

1600. Climate change projection data are available from the UKCP18 database (Met Office, 2019), which would be used to understand the likely changes to key climate parameters within the CCR Study Area. South-west Wales is expected to experience warmer, wetter winters and hotter, drier summers over the next few decades, consistent with the UKCP18 database and headline findings. Projections indicate a continued shift toward higher mean temperatures year-round, aligning with the UK-wide trend of warming under both moderate and high-emission futures. Winters are likely to become slightly wetter, while summers may see notable drying. These changes also accompany a rise in the frequency of extreme heat events and a growing likelihood of intense, localised rainfall.

1601. The following climate hazards in **Table 4.4.3** are **scoped in** to the EIA.

Table 4.4.3 Climate Hazards Scoped in to the CCRA

CLIMATE HAZARD	TYPE OF CLIMATE HAZARD	RATIONALE
Heatwaves	Acute	Extreme high temperatures, particularly in summer, can lead to increased frequency and severity of heatwaves, impacting health of workers, and causing damage or affecting the condition or performance of assets.
Warming	Chronic	Increase in average temperatures can warm ambient environments, impact health of workers, and affect the condition and performance of assets.
Dry Spells	Chronic	Combined changes in environmental conditions, e.g. dry spells (low precipitation) and extreme high temperatures, can result in wildfires, subsidence and dust creation risks and affect vegetation health.
Oceanic Stressors	Chronic	Combined change in environmental conditions, e.g. increase in average sea surface temperatures, strong waves and increasing sea salinity can increase corrosion risks.
Extreme Weather Events	Acute	Increased frequency and / or severity of all types of extreme weather event or climate hazard.
Fluvial Flooding	Acute	Extreme precipitation leading to extreme river flows and levels (fluvial flooding).
Pluvial Flooding	Acute	Extreme precipitation leading to extreme surface water flows and levels (pluvial flooding). Onshore Transmission Station(s) at risk of damage / failure from water ingress and compromised condition of assets due to repeated exposure to flood water.

CLIMATE HAZARD	TYPE OF CLIMATE HAZARD	RATIONALE
Extreme Precipitation Events	Acute	Increased frequency and intensity of extreme precipitation events can cause harm to workforce (increased slips and falls) and deterioration in the condition of assets (due to increased exposure to water).
Landslides	Chronic	Landslides induced by increased precipitation which can increase the likelihood of ground instability in already susceptible areas, posing a credible risk to the integrity, operability, and longevity of the substation and underground cable assets over the wind farm's lifecycle.
Extreme storms	Acute	Increase in storm intensity (wind speed) can impact the Development infrastructure and workforce. Increase in frequency of storm conditions can impact electricity generation, operational ability and revenue. Back-to-back events causing damage to assets can compromise structural integrity if timely repairs are not undertaken. Change in storm patterns, e.g. wind direction can impact maintenance schedules and asset performance.
Lightning	Acute	Increase in the frequency of lightning events can cause damage to wind turbines and onshore substations.

4.4.3 Data Sources

1602. **Table 4.4.4** outlines existing key data and information sources that would be used to inform the EIA.

Table 4.4.4 Key Data and Information Sources for the CCR Section

DATASET	YEAR(S)	DESCRIPTION
Met Office UK Climate Projection (UKCP18) Database and supporting reports	Various	Climate change projection data and summaries for the UK for various climate variables such as air temperature and precipitation. Note: UKCP data is most applicable to onshore and coastal areas. '18' refers to the year that the data was first approved and published, although enhancements to the data have been published since 2018. This data is considered to be applicable to this CCRA.
Met Office's UK Climate Averages and Regional Climate Summaries	Various	Historical climate observations and current climate conditions for the UK.
Intergovernmental Panel on Climate Change Sixth Assessment Report	Various	Current global state of knowledge on climate science and possible climate futures.

DATASET	YEAR(S)	DESCRIPTION
		Provides the most up-to-date and comprehensive assessment of the global state of scientific knowledge on climate change, including observed and projected climate impacts, risks, mitigation pathways, and adaptation options under a range of future climate scenarios.
Marine Climate Change Impacts Partnership Reports	Various	A collection of evidence reviews and summary reports on climate change effects in the marine environment.
Offshore Wind Climate Adaptation and Resiliency Study (New York State Energy Research and Development authority, 2021)	2021	Review of key climate factors to the offshore wind sector and opportunities for climate resilience.
Department for Business, Energy and Industrial Strategy's Offshore Energy Strategic Environment Assessment 4	2022	Observed meteorological conditions at seas around the UK.
Intergovernmental Panel on Climate Change Fifth Assessment Report	2014	This report defines a range of Representative Concentration Pathways (RCP)17, which are different possible trajectories of atmospheric concentrations of GHG, based on socio-economic and policy assumptions used in climate change projection modelling. These are used to predict future climate conditions.

1603. It is important to present the assumptions and limitations of the assessment because it defines the boundaries and reliability of the climate risk assessment. Climate projections are inherently uncertain, depend on scenario choices, and vary across spatial and temporal scales, so this additional information ensures transparency in how conclusions are drawn. It allows readers to understand the basis on which future climate risks are evaluated, recognise where supplementary evidence has been used, and interpret results appropriately. Ultimately, this strengthens the robustness and credibility of the assessment by showing that uncertainties have been acknowledged, justified, and carefully managed rather than ignored. These are set out in **Table 4.4.5**.

¹⁷ The RCP scenarios are related to the concentrations of GHG that would result in target amounts of radiative forcing (measured in watts per square meter (W/m²)) at the top of the atmosphere by 2100, relative to pre-industrial levels. Radiative forcing is a measure of the influence of factors (like GHG) on the energy balance of the Earth's atmosphere.

Table 4.4.5 Data Limitations and Assumptions

ASSUMPTION / LIMITATION	FURTHER DETAIL / DISCUSSION
<p>Climate Change Projections</p>	<p>A key assumption of the climate change projection data from UKCP18 is that the model is strongly dependent on the future global GHG atmospheric concentrations and emission trajectories. The RCP scenarios considered by UKCP18 cover a recent set of assumptions based on future population dynamics, economic development, and account for international targets on reducing GHG emissions. Each RCP scenario has a different climate outcome, given that they are based upon a different set of assumptions.</p> <p>Noting that the UKCP18 guidance cautions against reliably placing probabilities on which scenario of GHG emissions is most likely, two RCP scenarios (RCP4.5 and RCP8.5) have been selected due to their relevance in presenting a range of possible outcomes over the operation and decommissioning stages of the Development.</p> <p>Due to the intrinsic uncertainty within climate change projection data, the UKCP18 data is based upon probabilistic projections, generating a normally distributed model per output. The model outputs values for the 10th, 50th and 90th percentiles, which represents the range of uncertainty, and is therefore presented in this CCR assessment.</p> <p>In addition, UKCP18 data do not cover all climate variables which may be relevant to the windfarm development area. Where information gaps exist, these are supplemented with other available literature sources, and it is considered that sufficient information is available upon which to base the assessment of the Development’s vulnerability to climate change.</p>
<p>Spatial Resolution of the Climate Baseline</p>	<p>Climate change projection data are provided for defined grid cells in the UKCP18 database. The size of the grid cell determines the spatial resolution of the projection data and how it corresponds to the Development. It is considered that the climate baseline across the Development would be adequately described by grid cells selected at the EIA stage.</p> <p>It should be noted that limited quantitative climate data is available for offshore locations and therefore the most appropriate onshore data would be used. The selected grid cell would be within reasonable proximity of the Development.</p> <p>The grid cells used for the UKCP18 land-based projections and wind projections would be shown.</p>
<p>Temporal Resolution of the Climate Baseline</p>	<p>Climate change projection data from UKCP18 are provided as a time series. The data is summarised, and average values are presented by 20-year time slices, which can be selected based on the stages of development. These time slices would be representative of current and future conditions within the life cycle of the Development and provide sufficient temporal coverage.</p> <p>Three different temporal scales would be considered, one for each stage – Construction (Short Term), Operation (Medium Term) and Decommissioning (Long Term).</p>

4.4.4 Approach to Impact Assessment

1604. The CCRA and subsequent resilience assessment would use sector-specific guidance and literature to determine the likely climate hazards, considering data included in the UKCP18 climate database. The CCRA would use the output from other topics, such as the Flood Consequence Assessment, to provide an assessment of the vulnerability of the Development to climate change.
1605. The methodology for the assessment would be informed by IEMA guidance, EIA Guide to: CCR and Adaptation (IEMA 2020, now known as ISEP) and the NRW guidance, CCRA Framework for Public Services Boards (NRW, 2023c). As the CCRA considers climate change impacts on the Development, as opposed to the impacts of the Development on other receptors, the assessment methodology differs from the general EIA approach presented in **Section 1.8 EIA Methodology**.
1606. A three-step methodology is adopted for the CCRA in line with industry good practice for assessments of climate change risks.
- First, relevant future climate hazards are identified using historic climate data and climate change projections, and the exposure of the Development is assessed for the construction, O&M and decommissioning stages.
 - Second, the vulnerability of Development receptors is evaluated by considering their sensitivity to climate hazards and their adaptive capacity, taking account of embedded design and management measures.
 - Finally, exposure and vulnerability are combined to determine the climate-related risks and to confirm whether additional adaptation measures are required.
1607. The step-by-step approach undertaken for the CCRA is set out in **Plate 4.4.1**.

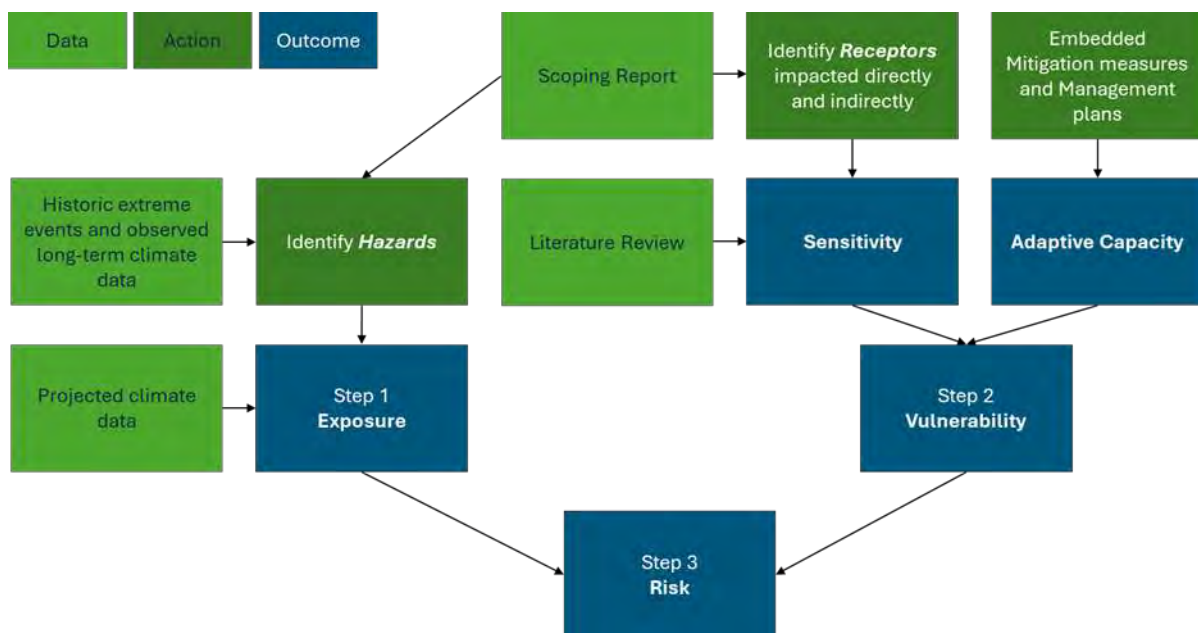









Plate 4.4.1 Three-step CCRA Methodology

Gwynt Glas Offshore Wind Farm Scoping Report

4.4.4.1 Receptors

1608. The following receptors as described in **Table 4.4.6** have been identified to have the potential to be affected by climate change for the following stages; construction, O&M and decommissioning.

Table 4.4.6 Relevant Receptors for the CCR Section

RECEPTOR TYPE	RECEPTOR DESCRIPTION	PROJECT STAGE
Human	Landfall and Onshore substation - Site personnel	Construction
	Offshore - Site personnel	Operation Decommissioning
Infrastructure (Temporary)	Landfall and Onshore Substation - Temporary assets such as compounds, accesses and plant and equipment	Construction Decommissioning
	Offshore - Temporary assets such as marine vessels and plant and equipment	
Infrastructure (Permanent)	Landfall and Onshore Substation - Condition and performance of permanent infrastructure, including: TJB and associated link boxes at landfall; Onshore export cables, jointing bays and associated link boxes; and Onshore Transmission Station(s)	Construction Operation
	Offshore - Condition and performance of permanent infrastructure, including: <ul style="list-style-type: none">  Wind turbines (including SKS and FSS, or innovative deepwater solutions);  Offshore Transmission Station(s);  Inter-Array Cables and Offshore Export Cables;  Subsea Power Collector(s);  Midpoint Compensation Reactor(s);  Subsea Transmission Station(s); and  Cable and scour protection. 	

4.4.5 Potential Impacts

4.4.5.1 Potential Impacts During the Construction Stage

1609. During construction, workers may experience heat-related illness during heatwaves. They may also face unsafe conditions during extreme storms, especially when working at height. Storms can generate wind-blown debris, which creates additional hazards. Wet weather and flooding can increase the likelihood of slips and trips. Combined or consecutive extreme weather events can

- delay programmes and increase workers' exposure to safety risks. During dry spells, construction activity can generate significant dust, which affects health, particularly for onshore crews.
1610. Temporary compounds, storage areas, drainage systems and access roads can experience water ingress during extreme rainfall. Heavy precipitation can overwhelm drainage systems, causing local flooding. Flooding can also block access routes needed for construction. High winds pose risks to plant, equipment and temporary facilities, potentially causing damage. Dry spells increase dust levels, which can degrade equipment and reduce operational efficiency.
1611. As a result, the following impacts are **scoped in** to the EIA for construction:
- Climate change impacts from marine climate hazards – offshore human, infrastructure and environmental receptors
 - Climate change impacts from land-based climate hazards – onshore human, infrastructure and environmental receptors
- 4.4.5.2 Potential Impacts During the O&M Stage
1612. Offshore and onshore O&M teams face heightened heat-stress during heatwaves and unsafe working conditions during extreme storms, which can force work stoppages and disrupt maintenance windows, elevating operational risk.
1613. Onshore assets (Onshore Converter Station, link boxes, Jointing Bays, Onshore Export Cables, TJB) may experience:
- Overheating of electrical equipment in heatwaves;
 - Subsidence risks to buried infrastructure during dry spells;
 - Vegetation encroachment with warming;
 - Wildfire exposure;
 - Water ingress and access loss from fluvial / pluvial flooding;
 - Increased wind loading on buildings / equipment;
 - Lightning-related surges and fire;
 - Coastal erosion / tidal flooding at landfall; and
 - Potential ground / slope instability under future extreme precipitation.
1614. Together these impacts result in outages, performance decline and higher O&M needs.
1615. Offshore infrastructure such as Offshore Transmission Station(s), wind turbines (including SKS and FSS and/or innovative deepwater solutions), Inter-Array Cables and Offshore Export Cables, Subsea Power Collector(s), Midpoint Compensation Reactor(s), Subsea Transmission Station(s) and scour protection are exposed to oceanic stressors (waves, salinity, temperature, sea-level rise, precipitation, severe storms) that could:
- Accelerate corrosion and deterioration;
 - Overheat platform electricals;
 - Contribute to blade edge erosion; and

- Cause major damage, outages and knock-on grid effects, necessitating more repairs and replacements.

1616. As a result, the following impacts are **scoped in** to the EIA for O&M:

- Climate change impacts from marine climate hazards – offshore human, infrastructure and environmental receptors
- Climate change impacts from land-based climate hazards – onshore human, infrastructure and environmental receptors

4.4.5.3 Potential Impacts During the Decommissioning Stage

1617. During onshore decommissioning, dry spells elevate dust and wildfire risks that can harm personnel and damage plant / equipment and temporary facilities; flooding can cause access loss and water ingress, while overwhelmed drainage can inundate sites; extreme storms can physically damage temporary facilities and equipment; and broader extreme-weather disruption can delay programmes and increase costs.

1618. Offshore decommissioning faces heat-stress risks to crews, physical damage to vessels and equipment from extreme storms, unsafe sea states that halt work, and broader extreme-weather disruption that triggers schedule delays and cost impacts across the decommissioning programme.

1619. The same potential impacts noted for construction are expected to be **scoped in** to the EIA for decommissioning.

4.4.5.4 Potential Inter-Relationship Impacts

1620. The impact assessment would consider the inter-relationship of impacts of climate change on individual receptors (for that topic) in accordance with the methodology outlined in **Section 1.8 EIA Methodology**. The objective would be to identify where climate change can accelerate or adversely influence the impacts on the environment and the relationship between those impacts, and whether this would give rise to a need for additional mitigation. It is therefore proposed that inter-relationship impacts of climate change on other environmental topic receptors / assets are **scoped in** to the EIA.

4.4.5.5 Potential Cumulative Impacts

1621. It is highly unlikely that the CCRA of the Development would be affected by neighbouring projects as the Development is considered isolated from other infrastructure projects in that other projects would not impact the climate within the region. The cumulation of several infrastructure projects in the same geographical area would not impact the climate related risks posed to those infrastructure projects. As such the operational systems and maintenance protocols of the Development would be designed to function independently of other infrastructure projects. This autonomy further reduces the likelihood of significant impacts from neighbouring developments. Therefore, cumulative effects are **scoped out** of the EIA.

4.4.5.6 Potential Transboundary Impacts

1622. It is not relevant to assess transboundary effects relating to CCRA, as the assessment focusses on the effects of climate change on the Development receptors only. Therefore, transboundary effects are **scoped out** of the EIA.

4.4.5.7 Summary of Impacts

1623. Table **Table 4.4.7** outlines the impacts which are proposed to be **scoped in** to and / or **out** of the EIA. This may be refined as additional information and data become available.

Table 4.4.7 Summary of Impacts Proposed to be Scoped In (✓) and Out (x) of the CCR Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Climate change impacts from marine climate hazards – offshore human, infrastructure and environmental receptors	✓	✓	✓
Climate change impacts from land-based climate hazards – onshore human, infrastructure and environmental receptors	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	x	x	x
Transboundary Impacts	x	x	x

4.4.6 Potential Mitigation Measures

1624. A number of embedded mitigation measures relevant to CCR, which are proposed to be incorporated into the design of the Development, proposed to reduce the potential for impacts of climate change on the Development, or constitutes standard mitigation measures for this topic, would follow the mitigation hierarchy outlined in **Section 1.8 EIA Methodology**.

1625. These measures typically include those that have been identified as good or standard practice and include actions that should be undertaken to meet existing legislation requirements. Embedded mitigation measures relating to CCR impacts are detailed in **Table 1.8.2 (Section 1.8 EIA Methodology)**.

1626. Requirements for any additional mitigation measures would be determined through the EIA.

1627. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders and would be fed iteratively into the design and assessment process. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

4.5 Greenhouse Gas Emissions

1628. Climate change was included as a required EIA topic in the EIA Directive 2014/52/EU, which was transposed into UK Infrastructure Planning (EIA) Regulations in 2017. Consideration of climate change in EIA comprises two separate assessments, the GHG emissions assessment and the CCR assessment, to determine the Development’s impacts on climate change and the impacts of climate change on the Development respectively. This section describes the proposed scope of work for the GHG emissions assessment. The scoping exercise for the CCR assessment is presented in **Section 4.4 CCR**.
1629. This section of the Scoping Report considers the scope of potential impacts of the pre-construction, construction, O&M, and decommissioning stages of the Development on GHG Emissions.
1630. This section provides an overview of the baseline environment and sets out the proposed methodology and approach to assessing effects on GHG emissions in the Development’s ES.
1631. One of the principal aims of the Development is to contribute to climate change mitigation by generating secure, low-carbon renewable energy, enabling the decarbonisation of the power sector and other sectors in the UK and progress towards achieving the UK and Welsh Government’s net zero targets. Refer to **Section 1.1.1** for further background on the need for the Development.
1632. The GHG Emissions assessment should be read in conjunction with **Section 1.5 Project Description**.

The following questions are posed to consultees to help them frame and focus their response to the scoping exercise for the GHG emissions assessment which would in turn inform the Scoping Opinion:

- Do you agree with the proposed GHG Emissions Study Area and that it is sufficient to capture the relevant impacts?
- Do you agree with the characterisation of the baseline environment?
- Have all the relevant data sources been identified in the Scoping Report?
- Have all the potential impacts on GHG emissions resulting from the Development been identified in the Scoping Report?
- Do you agree with the impacts that have been scoped in (or scoped out) of further assessment?
- Do you agree with the proposed approach to assessment?

4.5.1 Study Area

1633. All GHG emissions would affect the same receptor, the global atmosphere, as opposed to directly affecting any specific local receptor. Emissions which are released or avoided due to the

Development would have the same effect on atmospheric GHG concentrations, and its net effect on the climate regardless of where they occur. Therefore, the GHG Emissions Study Area is not geographically defined.

1634. The scope of the GHG emissions assessment would include quantifying direct and indirect GHG emissions arising from the Development over its whole lifecycle: pre-construction, construction, O&M and decommissioning. The GHG Emissions Study Area would include activities resulting in GHG emissions within geographically defined areas such as the use of construction plant and equipment, and those with no definable geographical boundary such as upstream raw material extraction and manufacturing processes in the supply chain of infrastructure components. Emission sources to be included in the GHG emissions assessment are presented in **Section 4.5.5**.
1635. In addition, the GHG emissions assessment would also consider avoided emissions enabled from the Development’s supply of renewable energy to the UK electricity transmission network, and the carbon benefits beyond the infrastructure system.

4.5.2 Baseline Environment

1636. The GHG emissions assessment evaluates the effect significance of GHG emissions, either released or avoided by a development, based on alignment with the decarbonisation trajectory compatible with the UK and Welsh Government’s net zero targets. Therefore, the existing and emerging regulatory landscape surrounding renewable energy and GHG emissions would be described to contextualise the assessment. The UK and Welsh Carbon Budgets (where available), other relevant national policies and targets on GHG emission reduction and offshore wind energy, and industry best practice would be reviewed and compared against the Development’s impacts on GHG emissions.
1637. To determine avoided emissions from the supply of renewable energy during the Development’s operations, an alternative baseline (i.e. “Do Nothing” scenario) would be defined, which assumes that the Development is not constructed, and the UK electricity grid mix remains business-as-usual.
1638. The UK electricity transmission network is currently supplied by several different forms of electricity generation with varying GHG intensities such as fossil fuels, nuclear and renewables. Latest available statistics on the UK grid electricity mix and GHG intensity at the time of writing the EIA would be used to summarise the current baseline. The Development’s supply of renewable energy to the UK electricity transmission network would contribute to the reduction of its operational GHG intensity in the long run.
1639. To derive avoided emissions during the Development’s operational lifetime, it is assumed that electricity generated by the Development would displace an equivalent amount of electricity that would have otherwise been generated using alternative forms of electricity generation. However, there is no standardised approach in the renewables sector on how avoided emissions from renewable energy developments should be derived, and there are uncertainties regarding which form of electricity generation would be displaced by any given renewable energy development and to what extent it would be displaced.
1640. For assessment purposes, the GHG emissions assessment would assume that the alternative form of electricity generation that would be displaced by the Development would be from natural gas using unabated Combined Cycle Gas Turbine. This is the most common form of new fossil fuel combustion plant and remains the current primary marginal source of generation in the UK (i.e.

the last dispatchable power that would increase or decrease supply to meet changes in electricity demand). This scenario is also in line with national climate and energy policies such as NPS EN-1 (DESNZ, 2025a) and the Clean Power 2030 Action Plan (NESO, 2024), which support the growth of renewable energy coupled with a transition away from fossil fuel-based electricity generation. Moreover, this scenario is aligned with the approach adopted in the UK Wind Energy Database (RenewableUK, no date).

1641. In addition, a sensitivity analysis would also be presented in the GHG emissions assessment to compare the natural gas scenario against reasonable alternative scenarios to provide a range of potential avoided emission estimates.

4.5.3 Data Sources

1642. **Table 4.5.1** outlines existing primary data that have been used to inform this section and would also be used to inform the EIA. No site-specific surveys are proposed for the GHG emissions assessment.

Table 4.5.1 Data Sources to Inform the Greenhouse Gas Emissions Assessment

DATA SET	SPATIAL COVERAGE	TEMPORAL COVERAGE
DESNZ GHG Reporting Conversion Factors Emission factors for various UK-based activities such as fuel consumption	UK	Latest available year at the time of assessment
DESNZ Digest of UK Energy Statistics Up-to-date statistics for the UK power sector, including the operational GHG intensity of each form of electricity generation	UK	Latest available year at the time of assessment
DESNZ Treasury Green Book Supplementary Guidance: Valuation of Energy Use and GHG Emissions for Appraisal Projected grid-average and long run marginal operational GHG intensity of the UK electricity transmission network up to 2100	UK	2023
NESO Future Energy Scenarios: Pathways to Net Zero Projected statistics for the UK power sector based on various future scenarios of energy demand and supply	UK	2025
Climate Change Committee Reducing the UK Carbon Footprint Lifecycle GHG intensities of various forms of electricity generation	UK	2013
CCC Progress Report to Parliament and Carbon Budgets Up-to-date information on the status of the UK and Wales's progress in reducing their GHG emissions and meeting its Carbon Budgets leading up to their net zero targets by 2050	UK	Various

DATA SET	SPATIAL COVERAGE	TEMPORAL COVERAGE
Inventory of Carbon and Energy Database Emission factors for embodied carbon in materials	International	2024

4.5.4 Approach to Impact Assessment

1643. The approach to the GHG emissions assessment would be based on the following guidance documents:

- Assessing GHG Emissions and Evaluating their Significance (ISEP, 2022b);
- Offshore Wind Industry Product Carbon Footprinting Guidance (The Carbon Trust, 2024);
- Port Emissions Toolkit No. 1 (GLoMEEP, 2018); and
- PAS2080 Carbon Management in Buildings and Infrastructure (BSI, 2023).

4.5.4.1 Emission Calculation Methodology

1644. GHG emissions would be estimated for each emission source **scoped in** to the EIA, as presented in **Section 4.5.5**. This would be undertaken using a calculation-based methodology, which involves multiplying development-specific activity data with representative emission factors, and where applicable, calorific, load and global warming potential (GWP) factors. Industry benchmarks and assumptions based on professional judgement would be used where data gaps exist.

1645. Subject to information availability, end-of-life emissions during decommissioning and embodied carbon from spare parts during repair and replacement events may be estimated using benchmarks from GHG assessments of previous offshore wind projects.

1646. Avoided emissions from the supply of renewable energy would be estimated based on comparison to the “Do Nothing” scenario, as set out in **Section 4.5.2**. This would be undertaken by multiplying the Development’s forecasted annual and lifetime electricity output with the operational GHG intensity of the alternative form(s) of electricity generation assumed to be displaced by the Development.

4.5.4.2 Impact Assessment Criteria and Receptors

1647. The impact assessment criteria for the GHG emissions assessment would be derived from the ISEP guidance (2022) and differs from the overall EIA methodology described in **Section 1.8 EIA Methodology**.

1648. The receptor for the GHG emissions assessment is defined as the global atmosphere. The receptor sensitivity would be characterised as high, given that it is cumulatively affected by all global sources of GHG emissions and the severe consequences of climate change.

1649. The magnitude of impact is not defined, as the effect significance in the GHG emissions assessment is not determined by the magnitude of GHG emissions alone (ISEP, 2022b). However, GHG emissions released and avoided by the Development would be calculated and reported in tonnes of carbon dioxide equivalent (CO₂e), a common unit used to account for differences in

- GWP between GHG. GHG emissions would be presented by emission source, stages and combined over the whole lifecycle.
1650. The effect significance criteria would be adapted from the ISEP guidance (2022), which recognises that: *“when evaluating significance, all new GHG emissions contribute to a negative environmental effect. However, some projects will replace existing development or baseline activity that have higher GHG profiles. The significance of a project’s emissions should therefore be based on its net impacts, which may be positive, negative or negligible”*.
1651. The ISEP guidance (2022) provides five distinct levels of significance (i.e. major adverse, moderate adverse, minor adverse, negligible and beneficial) to assist assessments of GHG emissions in an EIA context. These criteria are not based solely on whether a development emits GHG emissions but rather on how it makes a relative contribution towards achieving a net zero compatible trajectory and the scale of mitigation efforts. Major adverse, moderate adverse and beneficial effects are considered to be significant in EIA terms.
1652. The effect significance of the Development’s GHG emissions would be evaluated for each stage, and the overall significance would be evaluated based on the net emissions, determined by the whole lifecycle emissions minus the avoided emissions.
1653. Comparisons to the UK and Welsh Government’s Carbon Budgets (where available) would be undertaken for each relevant budget period to determine the effect of the Development’s GHG emissions on the ability to meet the relevant Carbon Budgets, and by proxy, the emission reduction needed to achieve and maintain net zero targets in the long-term. To assist with evaluating effect significance, the Development’s operational and lifetime GHG intensity per unit of electricity would also be calculated to allow like-for-like comparisons with the UK electricity grid mix and alternative forms of electricity generation.

4.5.5 Potential Impacts

1654. Potential impacts considered in the GHG emissions assessment include direct and indirect emission sources resulting from activities associated with the Development’s pre-construction, construction, O&M and decommissioning stages. Avoided emissions from the supply of renewable energy to the UK electricity transmission network during the Development’s operations would also be considered.
1655. GHG emissions released or avoided by the Development may occur outside the Onshore Development Area, Offshore Development Area and the UK’s territorial boundary such as upstream supply chain emissions. Therefore, given that GHG emissions affect the climate wherever they occur and the need to avoid “carbon leakage” overseas when reducing UK territorial emissions, such emissions are included in the GHG emissions assessment for completeness.
1656. **Table 4.5.2** identifies emission sources over the Development’s whole lifecycle which are proposed to be included / excluded from the GHG emissions assessment and the rationale. Emission sources in the scoping exercise are presented for the following stages and lifecycle modules adapted from the PAS2080 guidance (BSI, 2023) and The Carbon Trust guidance (2024), which advocate for a modular approach to GHG emission calculations. The scope of the assessment would be revisited at later stages to align with the most up-to-date design of the Development and is subject to the availability of information.

Table 4.5.2 Emission Sources Proposed to be Scoped In (✓) and Out (x) of the Greenhouse Gas Emissions Assessment

STAGE	PAS2080 LIFECYCLE MODULE	EMISSION SOURCES	RATIONALE FOR SCOPING IN OR OUT
Pre-construction	A0: Preliminary Studies, Design and Engineering	Design, engineering and other pre-construction activities	<p>✓</p> <p>Emissions from design, engineering and other pre-construction activities are unlikely to be significant, as it is anticipated that most works would be office-based. These emission sources are, therefore, excluded from the GHG emissions assessment.</p> <p>However, emissions from fuel and electricity consumption during pre-construction surveys and site preparation activities (e.g. geotechnical surveys and seabed preparation) and embodied carbon in materials used in pre-construction equipment (e.g. met masts) would be considered where information is available.</p>
Construction	A1: Raw Materials Supply A2: Transport to Manufacturing Facility A3: Manufacturing	Embodied carbon in materials used to construct the Development (e.g. wind turbines and floating foundations)	<p>✓</p> <p>This is likely to be a key emission source due to the use of materials with high embodied carbon content such as concrete and steel and materials with used in high quantities such as aggregates.</p>
	A4: Transport to / from Construction Site	Fuel and electricity consumption from the movement of materials, plant and equipment, waste and personnel to / from site using marine vessels, road vehicles and helicopters	<p>✓</p> <p>This is likely to be a key emission source due to the large number of transport movements likely to be required during construction.</p>

Gwynt Glas Offshore Wind Farm Scoping Report

STAGE	PAS2080 LIFECYCLE MODULE	EMISSION SOURCES	RATIONALE FOR SCOPING IN OR OUT	
	A5: Construction	Fuel and electricity consumption associated with plant and equipment use	✓	This is likely to be a key emission source due to the scale of on-site activities required during construction such as for the installation of infrastructure.
		Land use change emissions from temporary habitat disturbance	✓	Should habitats with high carbon storage and sequestration potential be identified (e.g. peatlands) within the Onshore Development Area from ecology surveys, there is potential for construction activities to result in land use change emissions.
O&M	B1: Use	Leakage of sulphur hexafluoride (SF ₆) used in electrical equipment	✓	This is likely to be a contributing emission source due to the high GWP of SF ₆ and is aligned with the requirements in NPS EN-5 (DESNZ, 2025c) for transmission infrastructure.
		Ongoing land use change emissions from long-term habitat loss and habitats created or enhanced by the Development	✓	Should habitats with high carbon storage and sequestration potential be identified (e.g. peatlands) within the Onshore Development Area from ecology surveys, there is potential for the presence of infrastructure to result in ongoing land use change emissions over the Development's operational lifetime.

Gwynt Glas Offshore Wind Farm Scoping Report

STAGE	PAS2080 LIFECYCLE MODULE	EMISSION SOURCES	RATIONALE FOR SCOPING IN OR OUT	
				In addition, created or enhanced habitats (e.g. landscaping) would also result in ongoing beneficial impact on carbon sequestration and storage over the Development's operational lifetime.
	B2: Maintenance B3: Repair B4: Replacement	Fuel and electricity consumption associated with transport and use of plant and equipment during maintenance, repair and replacement events	✓	These are likely to be contributing emission sources due to O&M requirements of infrastructure over the Development's operational lifetime.
		Embodied carbon in materials used in spare parts during repair and replacement events	✓	
	B5: Refurbishment	No emission sources have been identified, as these are proposed to be scoped out from the GHG emissions assessment.	x	The Development is unlikely to undergo refurbishment during its operational lifetime; therefore, this emission source is not relevant.
	B6: Operational Energy Use B7: Operational Water Use B8: Other Operational Processes		x	The Development's operational energy requirements are likely to be minimal and are assumed to likely be delivered by its own electricity generation. Operational water demand is likely to be negligible, as the infrastructure would be unattended assets. Emissions from other operational processes (e.g. waste management) are also likely to be negligible.

Gwynt Glas Offshore Wind Farm Scoping Report

STAGE	PAS2080 LIFECYCLE MODULE	EMISSION SOURCES	RATIONALE FOR SCOPING IN OR OUT	
	B9: User's Utilisation of Infrastructure		x	<p>Although end users would use the renewable energy supplied by the Development, they would not directly interact with the infrastructure. Therefore, this emission source is not relevant.</p> <p>It is not relevant to assess downstream emissions from the end uses of electricity because the operational GHG intensity of renewable energy is zero.</p>
	D: Benefits and Loads beyond the Infrastructure System	Avoided emissions from the supply of renewable energy to the UK electricity transmission network	✓	This is likely to be a key emission source, as it represents the Development's carbon benefits and demonstrates the need for the Development.
		Reductions in electricity output of the Development and neighbouring offshore wind farm(s) due to potential inter-array wake effects	✓	<p>Potential impacts on GHG emissions from wake effects would be considered in alignment with NPS EN-3 (DESNZ, 2025b) subject to availability of modelling results and discussions with other developer(s).</p> <p>A sensitivity analysis would be undertaken to determine the net effect on total avoided emissions of the Development and neighbouring offshore wind farm(s) from potential inter-array wake effects.</p>

STAGE	PAS2080 LIFECYCLE MODULE	EMISSION SOURCES	RATIONALE FOR SCOPING IN OR OUT	
Decommissioning	C1: Deconstruction C2: Transport to / from Decommissioning Site C3: Waste Processing for Recovery C4: Disposal	Fuel and electricity consumption from deinstallation of infrastructure and transport to landfill or other end-of-life destinations Fuel and electricity consumption and process emissions during the treatment and processing of waste for reuse, recycling or disposal	✓	The Development’s final decommissioning strategy would only be confirmed closer to the time of decommissioning. However, this is likely to be a contributing emission source due to the scale of on-site activities and downstream end-of-life activities required during decommissioning.
Whole Lifecycle	All lifecycle modules scoped in to the GHG emissions assessment.	All emission sources scoped in to the GHG emissions assessment.	✓	Whole lifecycle emissions are determined based on the Development’s total construction, O&M and decommissioning emissions minus its avoided emissions (including any reductions from potential inter-array wake effects to be considered in the sensitivity analysis). This represents the Development’s net impact on GHG emissions.

4.5.5.1 Potential Inter-Relationship Impacts

1657. As the receptor for the GHG emissions assessment is the global atmosphere, there are no other EIA topics which directly affect this receptor. Therefore, there are no inter-relationship impacts to consider with respect to GHG emissions, this is therefore **scoped out** of the EIA.

4.5.5.2 Potential Cumulative Impacts

1658. All developments which emit, avoid or sequester GHG emissions affect global atmospheric concentrations irrespective of their location. Therefore, the impacts of the Development’s GHG emissions are global and cumulative by nature. This would be taken into account in defining the receptor sensitivity of the global atmosphere as high.

1659. The ISEP guidance (2022) states that the cumulative effects of GHG emissions from other plans and projects should therefore not be individually assessed, as there is no basis for selecting which plan or project to assess cumulatively over any other. The GHG emissions assessment is considered to be inherently cumulative, and no additional consideration of cumulative effects is required. This is therefore **scoped out** of the EIA.

4.5.5.3 Potential Transboundary Impacts

1660. As the receptor for the GHG emissions assessment is the global atmosphere, the Development’s GHG emissions have potential for an indirect transboundary impact. As GHG emissions are evaluated in the context of the UK and Welsh Government’s Carbon Budgets (where available) and long-term net zero targets, the Development’s impacts on the emission reduction efforts required by international climate commitments are inherently considered in the GHG emissions assessment. Therefore, transboundary effects are **scoped out** of the Development GHG emissions assessment.

4.5.5.4 Summary of Potential Impacts

1661. **Table 4.5.3** outlines the impacts which are proposed to be **scoped in** to and / or out of the EIA. This may be refined as additional information and data become available. Specific emission sources to be considered in the GHG emissions assessment for each stage are detailed in **Table 4.5.2**.

Table 4.5.3 Summary of Impacts Proposed to be Scoped In (✓) and Out (x) of the Greenhouse Gas Emissions Assessment

POTENTIAL IMPACT	CONSTRUCTION	O&M	DECOMMISSIONING
Whole lifecycle GHG emissions	✓	✓	✓
Avoided emissions from the supply of renewable energy to the UK electricity transmission net work	x	✓	x
Net contribution to the UK and Welsh Government’s decarbonisation trajectory compatible with the net zero targets	✓	✓	✓
Inter-relationship Impacts	x	x	x
Cumulative Impacts	x	x	x
Transboundary Impacts	x	x	x

4.5.6 Potential Mitigation Measures

1662. Mitigation measures, if required, would evolve as the EIA progresses and in response to consultation with the relevant stakeholders. All of the proposed mitigation measures would comply with regulatory requirements and good practice.

1663. The ISEP guidance (2022) and PAS2080 guidance (BSI, 2023) recognises the importance of mitigation measures to minimise GHG emissions from a development. The GHG emissions assessment would consider emission reduction measures embedded through the design process and regulatory requirements and identify opportunities for further emission reductions where practicable. Principles and best practices for management of whole lifecycle emissions would also be outlined based on the PAS2080 guidance (BSI, 2023) for further consideration. This is in line

with NPS EN-1 (DESNZ, 2025a), which require that energy infrastructure developments should reduce GHG emissions at every stage of development and ensure that emissions are minimised as far as possible.

- 1664. The suitability of potential emission reduction measures would depend on various factors such as technical feasibility, supply chain constraints and cost. Potential measures may include optimising the efficiency of vessel activities to minimise fuel consumption and reducing embodied carbon through resource efficiency and procurement measures.
- 1665. In addition, the GHG emissions assessment would be informed by sustainability requirements from the Development's AfL obligations with The Crown Estate. This includes the requirement for regular reporting of GHG emissions from activities throughout the lifecycle of the Development.

4.6 Major Accidents and Disasters

1666. Following guidance to be published by the OWEKH, it is proposed that consideration of MADs within the EIA process for the Development is based on assessments conducted within individual technical sections where this can be adequately covered by the scope of these sections.

1667. The OWEKH guidance on this approach to Major Accidents and Disasters (MADS) is outline below.

“Evidence from 33 UK OWF EIAs completed since 2017 demonstrates that the expected effects arising from the vulnerability of the proposed Development to major accidents or disasters (MADs) are not likely to be significant. All assessments reviewed either scoped out impacts relating to workplace accidents, natural disasters or climate risks, or did not identify any impacts of significance.

Potential accident risks are appropriately addressed through topic-specific risk assessments within the relevant technical Sections. This includes, but is not limited to, navigational risk assessments (**Section 2.7 Shipping and Navigation**), UXO risk assessments (**Section 1.5.4**), pollution prevention and spill control measures (**Section 1.8.5**), aviation and radar safeguarding assessments (**Section 2.8 Aviation and Radar**), climate change risk assessments (**Section 4.4 CCR**), and geotechnical and ground condition investigations (**Section 3.2 Geology and Land Quality**).

Health and safety risks are managed separately under relevant legislation and regulatory regimes, as they are primarily addressed outside the scope of EIA.

In line with this established evidence base and regulatory precedent, Offshore MADs are therefore proposed to be scoped out of further assessment as a proportionate approach and relevant assessment being provided in the specific topic chapters as outlined above. T

1668. Following a review of the potential accident risks, the following technical sections of the DCO submission would adequately address any potential accidents risks and topic-specific risk assessments:

- Coastal erosion, climate change and flood risk (considered within the ‘Marine Geology, Oceanography and Physical Processes including Water Quality’, ‘Flood Risk and Hydrology’ and ‘GHG Emissions Assessment’ EIA sections);
- Accidental spills of hazardous material (considered within the ‘Marine Geology, Oceanography and Physical Processes including Water Quality, and ‘Human Health’ EIA sections);
- Extreme temperature and weather events (considered within the CCR EIA sections);
 - Vessel collision through navigational risks (considered within the ‘Shipping and Navigation’ EIA section);
 - UXO risk (considered in ‘Marine Mammals and Marine Turtles’ and ‘Marine Geology, Oceanography and Physical Processes including Water Quality’ EIA sections, geophysical and geotechnical investigations); and
 - Exposed cables leading to vessel snagging (considered within the ‘Shipping and Navigation’ and ‘Commercial Fisheries’ EIA sections).

1669. As a result, a separate MADS ES section would not be produced for the DCO submission and is effectively **scoped out** for the EIA.

5 Conclusion

1670. **Section 2, 3 and 4** of this Scoping Report identify the Development's potential impacts based on an understanding of the environmental conditions likely to be encountered in the relevant study areas, utilising publicly available data sources. Where potential impacts have been scoped out, justification has been provided in the relevant subsections of this report.

1671. Consultees are invited to consider all of the information provided in this Scoping Report and provide comments on the proposed approach and in particular whether they agree with the conclusions. Topic specific questions for consultees are provided at the beginning of each technical section, designed to focus the review on the key elements of each technical topic in this Scoping Report.

5.1 Summary

1672. **Table 5.1.1** summarises the impacts which have been scoped in and out of further assessment.

Table 5.1.1 Summary of Impacts Proposed to be Scoped In (✓) or Scoped Out (X) of Further Assessment.

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Offshore			
2.1 Marine Geology, Oceanography and Physical Processes including Water Quality			
Impacts on waves and tidal currents	×	✓	×
Impacts on sediment transport processes and morphological change of the seabed	✓	✓	✓
Impacts on sediment transport processes and morphological change at the coastline	✓	✓	✓
Impacts on SSCs and seabed morphology due to resuspended sediment	✓	✓	✓
Impacts on contaminant concentrations due to changes in SSCs	✓	×	✓
Impacts on water column stratification influencing nutrient fluxes and primary production	×	✓	×
Indentations on the seabed due to installation, O&M and decommissioning vessels	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Cumulative impacts	✓	✓	✓
Transboundary impacts	×	×	×
2.2 Benthic Habitat			
Temporary physical disturbance	✓	✓	✓
Permanent habitat loss	×	✓	×
Increased SSCs and sediment deposition	✓	✓	✓
Remobilisation of contaminated sediments	✓	✓	✓
Pollution events resulting from the accidental release of pollutants	×	×	×
Introduction of marine INNS	×	×	×
Colonisation of introduced substrate	×	✓	×
Disturbance from noise and vibration	×	×	×
Interactions of EMFs	×	✓	×
Sediment heating from subsea cables	×	×	×

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	×	×	×
2.3 Fish and Shellfish Ecology			
Temporary habitat loss and physical disturbance	✓	✓	✓
Permanent habitat loss	×	✓	×
Increased SSCs	✓	✓	✓
Remobilisation of contaminated sediments	✓	✓	✓
Underwater noise and vibration	✓	✓ ¹⁸	✓
Barrier effects	✓	✓	✓
Introduction of hard substrate	×	✓	×

¹⁸ For behavioural disturbances only.

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Changes in fishing activity	✓	✓	✓
Heat impacts from cables	×	×	×
EMF impacts from cables	×	✓	×
Inter-relationship impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	×	×	×
2.4 Marine Mammals			
Auditory injury resulting from underwater noise	✓	×	✓
Behavioural and disturbance impacts resulting from underwater noise (including from vessels)	✓	✓	✓
Barrier effects from underwater noise	×	×	×
Disturbance at seal haul-out sites	✓	×	✓
Vessel interaction (increase in risk of collision)	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Secondary entanglement	×	✓	×
Changes to prey resource	✓	✓	✓
Changes to water quality	×	×	×
Barrier effects from the physical presence of the wind farm	×	×	×
Effects from EMFs	×	×	×
Inter-relationship impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
2.5 Offshore Ornithology			
Direct disturbance impacts due to presence and movement of vessels and other plant	✓	✓	✓
Disturbance and / or phototaxis impacts due to artificial lighting	✓	✓	✓
Disturbance and displacement impacts due to presence of wind turbines	×	✓	×

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Barrier effects due to presence of wind turbines	×	✓	×
Collision impacts with turbines	×	✓	×
Combined collision and displacement impacts due to turbine presence (Gannet only)	×	✓	×
Indirect impacts on ornithological features due to impacts on prey species and habitats	✓	✓	✓
Entanglement	×	✓	×
Inter-relationship Impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	×	✓	×
2.6 Commercial Fisheries			
Reduction in access to, or exclusion from established fishing grounds within the Array Scoping Boundary	✓	✓	✓
Reduction in access to, or exclusion from established fishing grounds within the Offshore Export Cable Scoping Boundary	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Displacement leading to gear conflict and increased fishing pressure on adjacent grounds	✓	✓	✓
Disturbance of commercially important fish and shellfish resources leading to displacement or disruption of fishing activity	✓	✓	✓
Increased vessel traffic associated with the Development within fishing grounds leading to interference with fishing activity	✓	✓	✓
Additional steaming to alternative fishing grounds for vessels that would otherwise fish within the Development	✓	✓	✓
Physical presence of infrastructure and potential exposure of that infrastructure leading to gear snagging	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
2.7 Shipping and Navigation			
Impact on vessel routeing	✓	✓	✓
Increased collision risk	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Increased contact / allision risk	✓	✓	✓
Increased grounding risk and reduction in under keel clearance due to subsurface infrastructure	✓	✓	✓
Risk of breakout / loss of station, tow or wind turbines	✓	✓	✓
Snagging of anchors and fishing gear	✓	✓	✓
Impact to emergency response and SAR capability	✓	✓	✓
Interference with radar, communications and positioning systems	✓	✓	✓
Impact on wet storage / marshalling areas	✓	✓	✓
Impact on port / harbours and nearshore operations	✓	✓	✓
Inter-relationship impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	✓	✓	✓
2.8 Civil and Military Aviation and Radar			

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Creation of an aviation obstacle environment for civil and military aircraft	✓	✓	✓
Increased air traffic in the area in relation to wind farm activities	✓	✓	✓
Impact to civil and military PSRs	✓	✓	×
Inter-relationship Impacts	✓	✓	✓
Cumulative impact to military and civil PSRs	×	✓	×
Cumulative creation of an aviation obstacle environment	✓	✓	✓
Cumulative increased air traffic in the area in relation to wind farm activities	✓	✓	✓
Transboundary Impacts	✓	✓	✓
2.9 Infrastructure and Other Users			
Impacts on other marine renewable energy developments / activities	✓	✓	✓
Impacts on subsea cables and pipelines	✓	✓	✓
Impacts on MoD activities	✓	✓	✓

Gwynt Glas Offshore Wind Farm Scoping Report

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Impacts on marine disposal and aggregate sites	✓	✓	✓
Impacts on aquaculture	✓	✓	✓
Impacts on offshore tourism and recreation	✓	✓	✓
Impacts on offshore oil and gas operations	×	×	×
Impacts on carbon capture and storage	×	×	×
Inter-relationship impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	×	×	×
2.10 Offshore Archaeology and Cultural Heritage			
Direct impacts on the cultural significance of known heritage assets	✓	×	×
Direct impacts on the cultural significance of potential heritage assets	✓	×	×
Indirect impact to heritage assets from changes to physical processes	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Direct impacts on the cultural significance of heritage assets outside the defined project or application boundary	×	×	×
Impacts on the cultural significance of heritage assets resulting from changes to their setting	×	×	×
Inter-relationship impacts	✓	✓	✓
Cumulative impacts	✓	✓	✓
Transboundary impacts	×	×	×
2.11 SLVIA			
Potential impact on landscape character resulting from the Offshore Export Cable Scoping Boundary	✓	×	✓
Potential impact on landscape character resulting from the offshore wind turbines, Offshore Transmission Station(s) and Midpoint Compensation Reactor(s)	✓	✓	✓
Potential impact on the special qualities of landscape designations resulting from the offshore cable corridor	✓	×	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Potential impact on the special qualities of landscape designations resulting from the offshore wind turbines and Offshore Transmission Station(s) and Midpoint Compensation Reactor (s)	✓	✓	✓
Potential impact on views experienced by visual receptors resulting from the offshore cable corridor	✓	×	✓
Potential impact on views experienced by visual receptors resulting from the offshore wind turbines, Offshore Transmission Station(s) and Midpoint Compensation Reactor(s)	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	×	×	×
Onshore			
3.1 Terrestrial Ecology and Onshore Ornithology			
Impacts to statutory and non-statutory designated sites.	✓	✓	✓
Permanent and temporary loss of terrestrial habitats.	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Habitat fragmentation and species isolation.	✓	✓	✓
Impacts on protected species and / or their resting / breeding sites.	✓	✓	✓
Spread of INNS	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
3.2 Geology and Land Quality			
Impacts to human health both on and off site from contamination sources	✓	✓	✓
Direct impacts on groundwater quality and groundwater resources from contamination sources and construction methods	✓	✓ (Onshore Transmission Station(s))	✓
Impacts on surface water quality and the ecological habitats they support, from contamination	✓	✓ (Onshore Transmission Station(s))	✓
Physical impacts on geologically designated sites	✓	× For operation and ✓	✓

Gwynt Glas Offshore Wind Farm Scoping Report

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
		for maintenance	
Loss, damage or sterilisation of mineral resources	✓	✓	✓
Impacts to human health, controlled waters, land stability, buildings and infrastructure from historical mining	✓	×	✓
Impacts to the built environment	✓	×	✓
Impacts to agricultural land	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
3.3 Flood Risk and Hydrology			
Direct disturbance of surface water bodies	✓	×	✓
Increased sediment supply	✓	×	✓
Supply of contaminants to surface and groundwater	✓	✓	✓
Changes to surface and groundwater flows and flood risk	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Cumulative impacts	✓	✓	✓
3.4 Land Use			
Agricultural drainage	✓	✓	✓
Agricultural productivity (overground infrastructure) - (temporary and permanent loss of agricultural land)	✓ (Temporary)	✓ (Permanent)	✓ (Temporary)
Agricultural productivity (buried infrastructure) - (temporary and permanent loss of agricultural land)	✓ (Temporary)	✓	✓ (Temporary)
Soil degradation and erosion	✓	×	✓
Impacts to soil characteristics and productivity as a result of cable heat emission	×	×	×
Sustainable Farming Scheme areas	✓	✓ (Onshore Transmission Station(s))	✓
Disruption to existing utilities	✓	×	✓
Disruption to PRoW and cycle routes	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M (Onshore Transmission Station(s))	DECOMMISSIONING
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
3.5 Onshore Archaeology and Cultural Heritage			
Physical impacts to designated historic assets	✓	×	×
Physical impacts to known and unknown non-designated historic assets	✓	×	×
Changes to the setting of designated historic assets, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Changes to the setting of non- designated historic assets, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Change to the setting of historic landscapes, which could affect their heritage significance.	✓	✓ (Onshore Transmission Station(s))	✓
Inter-relationship Impacts	✓	✓ (Onshore Transmission Station(s))	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Cumulative Impacts	✓	✓ (Onshore Transmission Station(s))	✓
3.6 LVIA			
Potential physical effects on existing landscape elements of the Landfall, Onshore Export Cable Corridor	✓	×	✓
Potential impact on landscape character resulting from the Landfall and Onshore Export Cable Corridor	✓	×	✓
Potential physical effects on existing landscape elements of the Onshore Transmission Station(s)	✓	✓	✓
Potential impact on landscape character resulting from the Onshore Transmission Station(s)	✓	✓	✓
Potential impact on the special qualities of landscape designations resulting from the Landfall and Onshore Export Cable Corridor	✓	×	✓
Potential impact on the special qualities of landscape designations resulting from the Onshore Transmission Station (s)	✓	✓	✓
Potential impact on views experienced by visual receptors resulting from the Landfall and Onshore Export Cable Corridor	✓	×	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Potential impact on views experienced by visual receptors resulting from the Onshore Transmission Station(s)	✓	✓	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative LVIAs	✓	✓	✓
3.7 Traffic and Transport			
Pedestrian Severance and Delay	✓	×	✓
Amenity	✓	×	✓
Fear and Intimidation	✓	×	✓
Road safety (including consideration of hazardous loads)	✓	×	✓
Driver delay (capacity)	✓	×	✓
Driver delay (highway constraints)	✓	×	✓
Driver delay (road closures)	✓	×	✓
Abnormal loads	✓	×	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	×	✓
3.8 Noise and Vibration			
Noise affecting human NVSRs	✓	✓	✓
Vibration affecting human NVSRs	✓	×	✓
Road traffic noise affecting human NVSRs	✓	×	✓
Road traffic vibration affecting human NVSRs	×	×	×
Offshore infrastructure airborne noise	✓ (Only if midpoint compensation is required)	×	✓ (Only if midpoint compensation is required)
Inter-relationship Impacts	✓	✓ (Noise only)	✓
Cumulative Impacts	✓	✓	✓
3.9 Air Quality			

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Impacts of emissions from dust from earthworks and construction on human and ecological receptors	✓	×	✓
Impacts of emissions from plant and machinery on human health	✓	×	✓
Impacts of emissions from road traffic on human health and ecological sites	✓	×	✓
Impacts of odours on human receptors	✓	×	✓
Inter-relationship Impacts	✓	×	✓
Cumulative Impacts	✓	×	✓
Project Wide Aspects			
4.1 Population and Human Health			
Physical activity	✓	×	✓
Risk taking behaviour	✓	×	✓
Diet and nutrition	×	×	×
Housing	✓	×	✓

Gwynt Glas Offshore Wind Farm Scoping Report

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Relocation	×	×	×
Open space, leisure and play	✓	×	✓
Transport modes, access and connections	✓	×	✓
Community safety	×	×	×
Community identity, culture, resilience and influence	×	×	×
Social participation, interaction and support	×	×	×
Education and training	×	×	×
Employment and income	✓	✓	✓
Climate change mitigation and adaptation	×	✓	×
Air quality	✓	×	✓
Water quality or availability	×	×	×
Land quality	×	×	×
Noise and vibration	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Radiation	×	×	×
Health and social care services	✓	×	✓
Built environment	×	×	×
Wider societal infrastructure and resources	×	×	×
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	×	×	×
4.2 Socio-economics			
Direct economic benefit (supply chain)	✓	✓	✓
Increased employment	✓	✓	✓
Increased skills and training	✓	✓	✓
Change in demographics due to transient labour or permanent migration	✓	✓	✓

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Loss of, disruption to, or pressure on local infrastructure and services	✓	×	✓
Impacts to Welsh language	✓	×	✓
Disturbance (noise, air, visual and traffic) to social infrastructure	✓	×	✓
Inter-relationship Impacts	✓	✓	✓
Cumulative Impacts	✓	✓	✓
Transboundary Impacts	×	×	×
4.3 Tourism and Recreation			
Disruption to recreational activities	✓	×	✓
Disruption to the tourism industry	✓	×	✓
Inter-relationship Impacts	✓	×	✓
Cumulative Impacts	✓	×	✓
Transboundary Impacts	×	×	×
4.4 CCR			

POTENTIAL IMPACT	SCOPED IN (OR OUT)		
	CONSTRUCTION	O&M	DECOMMISSIONING
Climate change impacts from marine climate hazards – offshore human, infrastructure and environmental receptors	✓	✓	✓
Climate change impacts from land-based climate hazards – onshore human, infrastructure and environmental receptors	✓	✓	✓
Cumulative Impacts	×	×	×
Transboundary Impacts	×	×	×
4.5 Greenhouse Gas Assessment			
Whole lifecycle GHG emissions	✓	✓	✓
Avoided emissions from the supply of renewable energy to the UK electricity transmission net work	×	✓	×
Net contribution to the UK and Welsh Government’s decarbonisation trajectory compatible with the net zero targets	✓	✓	✓
Inter-relationship Impacts	×	×	×
Cumulative Impacts	×	×	×
Transboundary Impacts	×	×	×

6 References

- ABP South Wales (2025). East Wales Pilotage Barry, Cardiff, And Newport And The River Usk, Pilotage Act 1987, Sections 7 And 8 Pilotage Directions 2025. Available at: <https://www.southwalesports.co.uk/Admin/content/files/Pilotage%20Directions%20-%20ABP%20East%20Wales%20and%20River%20Usk.pdf> (Accessed 18 February 2026). [https://www.southwalesports.co.uk/Admin/content/files/Pilotage Directions - ABP East Wales and River Usk.pdf](https://www.southwalesports.co.uk/Admin/content/files/Pilotage%20Directions%20-%20ABP%20East%20Wales%20and%20River%20Usk.pdf)
- ABPmer (2003). *Investigation of possible impacts of offshore wind farms on sediment transport*. Report to the Department of Trade and Industry (DTI), London.
- ABPmer (2008). *Review of Round 1 OWF data: Sediment processes and scour*. Report to COWRIE Ltd, London
- ABPmer (2018). *SEASTATES*. Available at: <https://www.seastates.net/explore-data/>. (Accessed: January 2026).
- Admiralty (2025a). *Sailing Directions NP 37*.
- Admiralty (2025b). *Nautical Charts 1121 and 1123*.
- Awel y Môr OWF (2022). Environmental Statement and Technical Supporting Documents. RWE Renewables.
- Baker, J., Beebee, T., Buckley, J., Gent, T. and Orchard, D. (2011) *The amphibian habitat management handbook*.
- Barker, J., Seymour, A., Mowat, S. and Debney, A. (2014). *Thames harbour seal conservation project*. Report for the UK & Europe Conservation Programme, Zoological Society of London.
- BERR (2008). *Atlas of UK Marine Renewable Energy Resources: Atlas Pages*. A Strategic Environmental Assessment Report, March 2008, 19pp
- BGS (no date). *BGS Geology Viewer*. Available at: <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/> (Accessed: June 2026).
- BiGGAR Economics (2021). *Wind Farms and Tourism Trends in Scotland: Evidence from 44 Wind Farms*.
- Bird Survey & Assessment Steering Group. (2025). *Bird Survey Guidelines for assessing ecological impacts*, <https://birdsurveyguidelines.org> (Accessed: March 2026)
- Bird Survey Guidelines (2026a; 2026b) *Non-breeding and breeding bird survey methodologies*.
- Blue Gem Wind (2022). *Project Erebus Environmental Statement Chapter 7: Marine Sediment and Water Quality*. Available at: [ORML2170 - Erebus ES Vol 1 Chapter 7 Marine Seabed and Water Quality final \(1\).pdf](#)
- Blue Gem Wind Ltd (2019) *Simply Blue Energy 1 Floating Offshore Wind Farm: Environmental Impact Assessment Scoping Report (Project Erebus, v1.3)*. Available at: <https://www.bluegemwind.com/wp-content/uploads/2020/07/SC1905-EIA-Scoping-Report-Project-Erebus-v1-3.pdf> (Accessed: February 2026)
- Blue Gem Wind Ltd (2020) *Erebus Environmental Statement*. Available at: <https://www.bluegemwind.com/planning/documents/> (Accessed: February 2026)
- Blue Gem Wind Ltd (2021). *Project Erebus Environmental Statement Chapter 11: Offshore Ornithology*.

Blue Gem Wind Ltd. (2021). Project Erebus Environmental Statement. Chapter 12: Marine Mammals.

Bradbury G., Trinder M., Furness B., Banks A.N., Caldow R.W.G., Hume, D. (2014). Mapping Seabird Sensitivity to Offshore Wind farms. PLoS ONE, 9(9), e106366. doi:10.1371/journal.pone.0106366. Note: 2017 correction to data availability statement is available.

British Geological Survey (BGS) (2020). Onshore Geoindex Viewer. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>. (Accessed February 2026)

British Geological Survey (2026). Groundwater vulnerability data for Wales. Available at: https://mapapps2.bgs.ac.uk/geoindex/home.html?_ga=2.218749913.1551308496.1773391203-1533697608.1773391203 . (Accessed March 2026)

British Society of Soil Science (2021) *Guidance Document 3: Working with soil – benefitting from soil management in development and construction*. British Society of Soil Science.

British Standards Institution (1991) BS 7445-2: *Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use*. London: BSI.

British Standards Institution (2003) BS 7445-1: *Description and measurement of environmental noise. Guide to quantities and procedures*. London: BSI.

British Standards Institution (2009a) BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*. London: BSI.

British Standards Institution (2009b) BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*. London: BSI.

British Standards Institution (2013) *Guidance on investigations for ground gas – Permanent gases and volatile organic compounds (BS 8576:2013)*.

British Standards Institution (2014a) BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. London: BSI.

British Standards Institution (2014b) BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings*. London: BSI.

British Standards Institution (2019). Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings. BS8485:2015+A1:2019.

British Standards Institution (2020). Code of Practice for Ground Investigations, BS 5930:2020

British Standards Institution (2023) PAS 2080:2023 Carbon management in buildings and infrastructure

British Standards Institution (2026). Investigation of Potentially Contaminated Sites – Code of Practice, BS EN 10175:2026

British Trust for Ornithology (BTO) (2026) Wetland Bird Survey data. Available at: <https://www.bto.org/our-science/projects/wetland-bird-survey>. (Accessed February 2026)

Buckingham, L., Bogdanova, M.I., Green, J.A., Dunn, R.E., Wanless, S., Bennett, S., Bevan, R.M., Call, A., Canham, M., Corse, C.J., Harris, M.P., Heward, C.J., Jardine, D.C., Lennon, J., Parnaby, D., Redfern, C.P.F., Scott, L., Swann, R.L., Ward, R.M., Weston, E.D., Furness, R.W., Daunt, F. (2022). Interspecific variation in non-breeding aggregation: a multi-colony tracking study of two sympatric seabirds. *Marine Ecology Progress Series*. 684: 181-197.

Bull JC, Börger L, Banga R, Franconi N, Lock KM, Morris CW, Newman PB, Stringell TB. (2017). Temporal trends and phenology in grey seal (*Halichoerus grypus*) pup counts at Marloes Peninsula, Wales. NRW Evidence Report No: 155, 23pp, Natural Resources Wales, Bangor.

Burnell, D., Perkins, A.J., Newton, S.F., Bolton, M., Tierney, T.D. and Dunn, T.E. (2023). Seabirds Count: a census of breeding seabirds in Britain and Ireland (2015-2021). Lynx Nature Books, Barcelona.

BVG Associates (2023). Guide to a Floating OWF [online] Available at: <https://guidetofloatingoffshorewind.com/wp-content/uploads/2023/10/BVGA-16444-Floating-Guide-r2.pdf> (Accessed: February 2026).

CAA (2019). CAP 670: Air Traffic Services Safety Requirements. Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-670/>

CAA (2021). CAP 774: UK Flight Information Services. <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-774/>

CAA (2025a). CAP 1616: Airspace change: Guidance on the regulatory process for changing the notified airspace design and planned and permanent redistribution of air traffic, and on providing airspace information. Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap1616/>

CAA (2025b). CAP 764: CAA Policy and Guidelines on Wind Turbines, 6th Edition December 2025. Available at: <https://www.caa.co.uk/publication/download/14561>

CAA (2025c). CAP: 168: Licensing of Aerodromes. Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-168/>

CAA (2026a). Air Navigation Order 2016/765. Available at: <https://www.legislation.gov.uk/uksi/2016/765>

CAA (2026b). CAP 032: UK Aeronautical Information Publication. Available at: <https://nats-uk.ead-it.com/cms-nats/opencms/en/Publications/AIP/>

CAA (2026c). CAP 437: Standards for Offshore Helicopter Landing Areas. Available at: <https://www.caa.co.uk/data-and-publications/publications/documents/content/cap-437/>

Cadw (1999) *Caring for Coastal Heritage*. Cardiff: Cadw: Welsh Historic Monuments. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Caring_for_Coastal_Heritage_EN_CY.pdf

Cadw (2011) *Conservation Principles for the Sustainable Management of the Historic Environment in Wales*. Cardiff: Welsh Government. Available at: https://cadw.gov.wales/sites/default/files/2019-05/Conservation_Principles%20for%20the%20sustainable%20managment%20of%20the%20historic%20environment%20of%20Wales.pdf

Cadw. (2017). Managing – Heritage Impact Assessment in Wales. [Online] Available at: <https://cadw.gov.wales/sites/default/files/2019-05/20170531Heritage%20Impact%20Assessment%20in%20Wales%2026917%20EN.pdf>.

Cadw. (2020). Managing the Marine Historic Environment of Wales. [Online] Available at: <https://cadw.gov.wales/sites/default/files/2020-03/39705%20Managing%20Marine%20E%20WEB.pdf>.

Caneco (2022). Graphical User Interface (GUI) developed for a stochastic avian Collision Risk Model (CRM). Available at: <https://dmpstats.shinyapps.io/sCRM/>

Carbon Trust (2015). Cable Burial Risk Assessment (CBRA) Methodology: Guidance for the Preparation of Cable Burial Depth of Lowering Specification (CTC835). London: Carbon Trust. Available at:

<https://www.carbontrust.com/sites/default/files/documents/resource/public/cable-burial-risk-assessment-guidance.pdf> (Accessed: 22 May 2026)

Carmarthenshire County Council (2014). Carmarthenshire Local Development Plan.

Carmarthenshire County Council (2018). Carmarthenshire Solar PV Development – Landscape Sensitivity and Capacity Study. Available at: Microsoft Word - 1. Solar contents Final issue 230117 . (Accessed February 2026)

Carmarthenshire County Council (2020). Local Development Plan (LDP) 2018-2033. Available at: Carmarthenshire County Council / Cyngor Sir Gâr - Deposit LDP

Carmarthenshire County Council (2023) *Air Quality Progress Report Carmarthenshire 2023*

Carmarthenshire County Council (2025a) Landscape Character Assessment for Carmarthenshire (Supplementary Planning Guidance, draft approved 31 March 2025, awaiting publication).

Carmarthenshire County Council (2025b). Contaminated Land Inspection Strategy.

Carmarthenshire County Council, Burry Port Masterplan. Available at:

<https://www.carmarthenshire.gov.wales/business/development-and-investment/burry-port/> (Accessed February 2026).

Carter MID, Boehme L, Cronin MA, Duck CD, Grecian WJ, Hastie GD, Jessopp M, Matthiopoulos J, McConnell BJ, Miller DL, Morris CD, Moss SEW, Thompson D, Thompson PM and Russell DJF. (2022). Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. *Front. Mar. Sci.* 9:875869. doi: 10.3389/fmars.2022.875869

Carter, M.I., Aarts, G., Van Beest, F.M., Bivins, M., Brasseur, S.M., Dietz, R., Duck, C.D., Galatius, A., Gilles, A., Haelters, J. and Hastie, G.D. (2025). At-sea distribution of seals on the Northwest European Shelf: Towards transboundary conservation and management. *Journal of Applied Ecology*, 63(1), p.e70236.

Cefas (1999). Cefas Data Portal; Bass Nursery Areas Maps 1999. [online] Cefas.co.uk. Available at: <https://data.cefas.co.uk/view/3452> (Accessed February 2026).

Cefas (2004). Offshore Wind Farms: Guidance Note for Environmental Impact Assessment in respect of Food and Environmental Protection Act and CPA requirements. Available at: <https://www.cefas.co.uk/publications/files/windfarm-guidance.pdf>

Cefas (2006). Scroby Sands OWF – Coastal Processes Monitoring. Final report (AE0262). Report to the Department of Trade and Industry (DTI) and Defra.

Cefas (2011). Guidelines for data acquisition to support marine environmental assessments of offshore renewable energy projects. Available at: https://tethys.pnnl.gov/sites/default/files/publications/CEFAS_2012_Environmenta_Assessment_Guidance.pdf

Cefas (2016). Suspended Sediment Climatologies around the UK.

Celtic Deep (2019). Celtic Deep. [online] Celtic Deep. Available at: <https://www.celticdeep.org/>.

Chanin, P. (2003) Monitoring the otter (or commonly cited as Ecology of the otter depending on your source version).

Chartered Institute for Archaeologists (CIfA) (2020a) Standard and guidance for historic environment desk-based assessment.

Chartered Institute for Archaeologists (CIfA) (2020b) Standard and guidance for archaeological geophysical survey.

Chartered Institute for Archaeologists (CIfA) (2023a) Universal guidance for archaeological field evaluation.

Chartered Institute for Archaeologists (CIfA) (2023b) Standard for archaeological field evaluation.

Chartered Institute of Ecology and Environmental Management (CIEEM) (2024) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal (Version 1.3).

Chartered Institute of Highways and Transportation (2010). Manual for Streets 2. Available at <https://www.ciht.org.uk/media/8722/manual-for-streets-2-ir-to-use-printable-version.pdf> (Accessed February 2026)

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal. Chartered Institute of Ecology and Environmental Management.

CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf>

City and County of Swansea (2017) Gower National Landscape Management Plan 2017.

CIfA (2020) Standard and Guidance for Historic Environment Desk-Based Assessments. [Online] Available at: <https://www.archaeologists.net/sites/default/files/2023-11/CIfA-SandG-DBA-2020.pdf>.

CIfA (2025) Code of Conduct: professional ethics in archaeology. [Online] Available at: https://archaeologists.net/sites/default/files/2025-10/Code-of-conduct_revOct-2025.pdf.

Contaminated Land: Applications in Real Environments (2012) Good practice for risk assessment for coal mine gas emissions. London: Contaminated Land: Applications in Real Environments.

Cleasby I.R., Owen E., Wilson L.J. and Bolton M. (2018). Combining habitat modelling and hotspot analysis to reveal the location of high density seabird areas across the UK: Technical Report. RSPB Research Report no. 63.

Collins, J. (ed.) (2023) Bat surveys for professional ecologists: Good practice guidelines. Bat Conservation Trust.

Collins, M.B. & Ferentinos, F. (1984). Residual circulation in the Bristol Channel, as suggested by Woodhead sea bed drifter recovery patterns. *Oceanologia Acta* 7, 33-42

Construction Industry Research and Information Association (2001) Contaminated Land Risk Assessment – A Guide to Good Practice, C552

Construction Industry Research and Information Association (2007) Assessing Risks Posed by Hazardous Ground Gases to Buildings, C665

Construction Industry Research and Information Association (2019) Abandoned Mine Workings Manual, C758D

Construction Industry Research and Information Association (2019) Unexploded Ordnance (UXO) Risk Management Guide for Land-based Projects, C785

Cook, A. (2026). Review of Aberdeen Bay Collision Risk Monitoring. The Biodiversity Consultancy.

- Cook, N (2006). Prehistoric Funerary and Ritual Sites Project: Ceredigion 2004-2006. Archaeoleg Cambria Archaeology.
- Coull, K.A., Johnstone, R. & Rogers, S.I. (1998). Fisheries Sensitivity Maps in British Waters. UKOOA, Aberdeen.
- Countryside Council for Wales, Cadw and ICOMOS UK (2007) Guide to good practice on using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process (2nd edn).
- Crashmap (2020) Crashmap: UK collision data. Available at: <https://www.crashmap.co.uk/> (Accessed: 2 June 2026).
- Davis, S. et al. (2023). Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Road Traffic and Movement (EATM). Institute of Environmental Management and Assessment
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The water vole mitigation handbook.
- DECC (2009). Offshore Oil and Gas Strategic Environmental Assessment 8 (SEA 8): Overall Report and associated specialist reports. Available at: <https://www.gov.uk/government/publications/strategic-environmental-assessment-8-supporting-documents> (Accessed: June 2026).
- DECC (2016) *UK Offshore Energy Strategic Environmental Assessment 3 (OESEA3): Environmental Report*. London: Department of Energy and Climate Change. Available at: <https://www.gov.uk/government/consultations/uk-offshore-energy-strategic-environmental-assessment-3-oesea3> (Accessed: June 2026)
- DECC (now Department for Energy Security and Net Zero) (2022). UK Offshore Energy Strategic Environmental Assessment 3 (OESEA4), Appendix 1a.8 Marine mammals.
- Defra (2018) *Construction code of practice for the sustainable use of soils on construction sites*. London: Department for Environment, Food and Rural Affairs.
- Defra (2025). Local Air Quality Management Technical Guidance (TG22). Department for Environment, Food and Rural Affairs. (Online) Available at: <https://laqm.defra.gov.uk/wp-content/uploads/2021/03/LAQM-TG22-May-25-v2.1.pdf> (Accessed February 2026)
- den Boon, J.H., Verhagen, H.J. and Sumer, B.M. (2004) Scour behaviour and scour protection for monopile foundations of offshore wind turbines.
- Department for Transport (2007). Manual for Streets. Available at: <https://assets.publishing.service.gov.uk/media/5a7e0035ed915d74e6223743/pdfmanforstreets.pdf> (Accessed: February 2026)
- Department for Transport (2009). Traffic Signs Manual Section 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations Part 1: Design. Available at: <https://assets.publishing.service.gov.uk/media/5a74adeaed915d7ab83b5ab2/traffic-signs-manual-chapter-08-part-01.pdf> (Accessed February 2026)
- Department for Transport (2024). Map: Count points. Available at: <https://roadtraffic.dft.gov.uk/count-points> (Accessed February 2026)
- Department of the Environment (1995). Industry Profiles for previously developed land
- Department of Transport and Welsh Office (1988) Calculation of Road Traffic Noise. London: H.M. Stationery Office. ISBN: 978-0115508479

Design Commission for Wales (2023). Designing for Renewable Energy in Wales, November 2023. Available at: Designing for Renewable Energy in Wales. (Accessed: February 2026)

Design Manual for Roads and Bridges (2020) LA 111 Noise and Vibration (Revision 2). Available at: <https://www.standardsforhighways.co.uk/>. (Accessed February 2026)

DESNZ (2025a). Overarching NPS for Energy (EN-1). [Online] Available at <https://assets.publishing.service.gov.uk/media/65bbfdbc709fe1000f637052/overarching-nps-for-energy-en1.pdf> (Accessed 16 November 2025)

DESNZ (2025b) National Policy Statement for Electricity Networks Infrastructure (EN-5).

DESNZ (2025c). NPS for Renewable Energy Infrastructure (EN-3). [Online] Available at <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/npsrenewable-energy-infrastructure-en3.pdf> (Accessed 16 November 2025)

DESNZ (2025d) National Policy Statement for Renewable Energy Infrastructure (EN-3)

DESNZ (2025e). NPS for Electricity Networks Infrastructure (EN5). [Online] Available at <https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/npselectricity-networks-infrastructure-en5.pdf> (Accessed 16 November 2025)

DESNZ (2025f). Proposed refinements for Allocation Round 8 and future rounds: consultation document. Available at: <https://assets.publishing.service.gov.uk/media/694018efcfacd5e888491fe0/ar8-scheme-changes-consultation.pdf> (Accessed: 25 May 2026).

DESNZ (2026a) DRAFT AR8 Contract Allocation Framework: List of Changes. Available at: https://assets.publishing.service.gov.uk/media/6a1d4cfd59fb7a60f827f556/AR8_CfD_List_of_changes.pdf

DESNZ (2026b) Consultation outcome. Government response to the proposed refinements for Allocation Round 8 and future allocation rounds (accessible webpage). Available at: <https://www.gov.uk/government/consultations/proposed-refinements-for-allocation-round-8-and-future-...>

Diederichs, A., Nehls, G., Dähne, M., Adler, S., Koschinski, S. and Verfuß, U. (2008). Methodologies for measuring and assessing potential changes in marine mammal behaviour, abundance or distribution arising from the construction, operation and decommissioning of offshore windfarms. Commissioned by COWRIE Ltd, 231.

Digital Health and Care Wales. (no date). Health Maps Wales. Retrieved from NHS Wales: <https://www.healthmapswales.wales.nhs.uk/>. (Accessed February 2026)

DNV (2004). Design of offshore wind turbine structures. Offshore Standard DNV-OS-J101. Oslo: DNV.

DTM (2024). EMODnet Digital Bathymetry Consortium. Available at: <https://doi.org/10.12770/cf51df64-56f9-4a99-b1aa-36b8d7b743a1> (Accessed February 2026)

Edgar, P., Foster, J. and Baker, J. (2010) The reptile habitat management handbook.

Ellis, J.R. (2010). Mapping spawning and nursery areas of species to be considered in Marine Protected Areas. CEFAS Report. Lowestoft: CEFAS.

Ellis, J.R., Milligan, S.P., Readdy, L., Taylor, N. & Brown, M. (2012). Spawning and nursery grounds of selected fish species in UK waters. CEFAS Science Series Technical Report 147. Lowestoft: CEFAS.

Emeana, C.J., Hughes, T.J., Dix, J.K., Gernon, T.M., Henstock, T.J., Thompson, C.E.L. and Pilgrim, J.A. (2016). The thermal regime around buried submarine high-voltage cables. *Geophysical Journal International*, 206(2), 1051–1064.

EMODnet (2019). EMODnet Biology data portal and associated data products for European marine species distribution. Available at: <https://www.emodnet-biology.eu> (Accessed: February 2026).

EMODnet (2022). European Marine Observation and Data Network Biology and Seabed Mapping datasets. Available at: Seabed Habitats | European Marine Observation and Data Network (EMODnet) (Accessed: February 2026).

EMODnet (2024). EMODnet Digital Bathymetry Consortium. Available at: <https://doi.org/10.12770/cf51df64-56f9-4a99-b1aa-36b8d7b743a1>

EMODnet (2025). EMODnet Human Activities: Vessel Density Map (AIS shipping data). Available at: <https://ows.emodnet-humanactivities.eu/geonetwork/srv/api/records/0f2f3ff1-30ef-49e1-96e7-8ca78d58a07c> (Accessed: 5 June 2026).

Environment Agency (2023) Approach to Groundwater Protection Position Statements (Excluding Position Statement J9)

Environment Agency (2025) Contaminated Land Special Sites. Available at: <https://www.data.gov.uk/dataset/e3770885-fc05-4813-9e60-42b03ec411cf/contaminated-land-special-sites> (Accessed February 2026)

Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM), (2017). Land-Use Planning and Development Control: Planning for Air Quality.

ERM and Ipsos MORI (2014). A Study into the Effect of National Grid Major Infrastructure Projects on Socio-economic Factors.

EUNIS (2022) *EUNIS Benthic Habitat Mapping*. European Nature Information System. Available at: <https://eunis.eea.europa.eu/habitats.jsp>

Evans, C.D.R. (1995a). Coastal geology. In Barne, J.H., Robson, C.F., Kaznowska, S.S. & Doody, J.P. (eds.) *Coasts and Seas of the United Kingdom. Region 12. Wales: Margam to Little Orme*. Coastal Directories Series, Joint Nature Conservation Committee, Peterborough, 23-28.

Evans, C.D.R. (1995b). Coastal landforms. In Barne, J.H., Robson, C.F., Kaznowska, S.S. & Doody, J.P. (eds.) *Coasts and Seas of the United Kingdom. Region 12. Wales: Margam to Little Orme*. Coastal Directories Series, Joint Nature Conservation Committee, Peterborough, 38-40.

Evans, P.G.H. and Waggitt, J.J. (2023). Modelled Distribution and Abundance of Cetaceans and Seabirds in Wales and Surrounding Waters. NRW Evidence Report, Report No: 646, 354 pp. Natural Resources Wales, Bangor.

First Bus Holdings Limited (2026). South and West Wales | First Bus. [online] www.firstbus.co.uk. Available at: <https://www.firstbus.co.uk/south-west-wales>. (Accessed February 2026)

Fitch, S. and Gaffney, V. (2011) *West Coast Palaeolandscapes Survey (WCPS) 2011*. Birmingham: Visual and Spatial Technology Centre, Institute of Archaeology and Antiquity, University of Birmingham. Available at: <https://heneb.org.uk/archive/dyfed/lostlandscapes/WCPSTEchnical.pdf>

FLOWW (2025). Best practice guidance for offshore renewable energy developments. Available at: <https://www.floww.org.uk> (Accessed: 25 May 2026).

- Forestry Commission (2022) National Forest Inventory Wales. Available at: <https://www.forestresearch.gov.uk/tools-and-resources/national-forest-inventory/> (Accessed: 3 June 2026).
- Furness, R.W. (2015). Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS). Natural England Commissioned Report 164.
- Furness, R.W. (2018). Consequences for birds of obstruction lighting on offshore wind turbines.
- Furness, R.W., Wade, H.M. and Masden, E.A. (2013). Assessing vulnerability of marine bird populations to offshore wind farms. *Journal of Environmental Management*, 119, 56-66.
- Gale, R. (1995) *A submerged forest at Whiteford Sands, Gower Peninsula*. *Proceedings of the Prehistoric Society*, 61, pp. 401–409
- Garthe, S. and Hüppop, O. (2004). Scaling Possible Adverse Effects of Marine Wind Farms on Seabirds: Developing and Applying a Vulnerability Index. *Journal of Applied Ecology*, 41, 724-734.
- Graham, E. (2011). GGAT103: Arfordir Coastal Heritage 2010-2011.
- Giles, N., Sands, T. and Fasham, M. (2005) Fish survey, evaluation and monitoring guidance.
- Gilles, A, Authier, M, Ramirez-Martinez, NC, Araújo, H, Blanchard, A, Carlström, J, Eira, C, Dorémus, G, Fernández-Maldonado, C, Geelhoed, SCV, Kyhn, L, Laran, S, Nachtsheim, D, Panigada, S, Pigeault, R, Sequeira, M, Sveegaard, S, Taylor, NL, Owen, K, Saavedra, C, Vázquez-Bonales, JA, Unger, B, Hammond, PS. (2023). Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys. Final report published 29 September 2023. 64 pp.
- Giralt Paradell, O., Cañadas, A., Bennison, A., Todd, N., Jessopp, M., Rogan, E. (2024). Aerial surveys of cetaceans and seabirds in Irish waters: Occurrence, distribution and abundance in 2021-2023. Department of the Environment, Climate & Communications and Department of Housing, Local Government & Heritage, Ireland. 260pp.
- Global Maritime Energy Efficiency Partnerships (GLoMEEP) (2018) Port emissions toolkit No. 1.
- Gov.UK (2024). Map Road traffic statistics - Road traffic statistics. [online] roadtraffic.dft.gov.uk. Available at: <https://roadtraffic.dft.gov.uk>.
- Gower Landscape Partnership on behalf of City and County of Swansea (2013). Gower Landscape Character Assessment, March 2013. Available at: [Gower_Landscape_Character_Assessment_2013\(2\).pdf](#). (Accessed: February 2026)
- Gwynt Glas OWF Limited (2026). Gwynt Glas OWF Marine Conservation Zone Assessment Screening Report.
- Gwynt Glas OWF Limited (2026). Gwynt Glas OWF Habitats Regulations Assessment Screening Report. June 2026.
- Hall, J. and Sambrook, P. (2010) *Saundersfoot HUB Heritage and Natural Environment Audit: Part A Saundersfoot Community Audit*. Llandeilo: Dyfed Archaeological Trust.
- Hamilton, D. (1973). The circulation of the Bristol Channel. *Journal of the Royal Astronomical Society* 32, 409-422.

Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Boerjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M., Scheidat, M. and Teilmann, J. (2021). Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen Marine Research.

Harris, S., Cresswell, P. and Jefferies, D.J. et al. (1989) Surveying badgers.

Heathershaw, A.D. & Hammond, F.D.C. (1980) Tidal currents and residual circulation in the Swansea Bay area of the Bristol Channel. In Collins, M.B., Banner, F.T., Tyler, P.A., Wakefield, S.J. & James, A.E. (eds.) Industrialised Embayments and Their Environmental Problems: A Case Study of Swansea Bay. Pergamon, Oxford, 123-156

Heinänen, S. and Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area, JNCC Report No.544 JNCC, Peterborough.

Heneb (2011), The Lost Lands of Our Ancestors. Available at: <https://heneb.org.uk/archive/dyfed/lostlandscapes/mesolithic.html> (Accessed February 2026)

Highways Agency (2020) *Design Manual for Roads and Bridges (DMRB): LA 112 Population and human health – Section 3 (Land use and accessibility)*. London: Highways Agency.

Historic England. (2025). Marine Geophysics - Data Acquisition, Processing, and Interpretation Guidance Notes (2nd Edition). <https://historicengland.org.uk/images-books/publications/marine-geophysics-data-acquisition-processing-interpretation/heag328-marine-geophysics-2nded/>.

HM Coastguard. (No date). Our locations. Available at: <https://hmcoastguard.uk/locations> (Accessed 18 February 2026).

ss, Energy and Industrial Strategy.

Horswill, C. and Robinson, R.A. (2015). Review of Seabird Demographic Rates and Density Dependence. JNCC Report no. 552.

HR Wallingford (2008). Scour and sediment processes around OWF foundations. Report to COWRIE Ltd.

HSE and MCA (2017). Regulatory expectations on moorings for floating wind and marine devices. Available at:

https://assets.publishing.service.gov.uk/media/5a822d33ed915d74e623631c/Regulatory_expectations_on_moorings_devices_from_HSE_and_MCA.PDF (Accessed: 25 May 2026)

HSE and MCA (2017). Regulatory expectations on moorings for floating wind and marine devices. <https://www.neathport.com/pilotage/pilotage-directions> (Accessed: February 2026).

Huckfield, P. (2016). GGAT140 From Forests to Firing Range, North Gower Coast Survey.

IAMMWG. (2023). Review of Management Unit boundaries for cetaceans in UK waters (2023). JNCC Report 734, JNCC, Peterborough, ISSN 0963-8091. <https://hub.jncc.gov.uk/assets/b48b8332-349f-4358-b080-b4506384f4f7>.

ICES (1977) ICES statistical rectangles. Available at: <https://www.ices.dk/data/maps/Pages/ICES-statistical-rectangles.aspx> (Accessed: 3 June 2026).

ICES (2019). International Bottom Trawl Survey (IBTS). ICES Database. Available at: <https://www.ices.dk> [Accessed: 5 February 2026].

ICES (2024). International Herring Larvae Surveys (IHLS). ICES Data Portal. Available at: <https://www.ices.dk> [Accessed: 5 February 2026].

- IEMA. (2022a). Effective Scoping of Human Health in Environmental Impact Assessments. Retrieved from IEMA (now known as Institute of Sustainability and Environmental Professionals - ISEP): <https://www.iema.net/media/s35fughe/iema-eia-guide-to-effective-scoping-of-human-health-nov-2022.pdf> (Accessed: February 2026)
- IEMA. (2022b). Determining Significance for Human Health in Environmental Impact Assessments. Retrieved from IEMA: <https://www.iema.net/resources/blog/2022/11/17/launch-of-the-eia-guidance-for-considering-impacts-on-human-health>. (Accessed February 2026)
- Institute of Air Quality Management (2020) *A guide to the assessment of air quality impacts on designated nature conservation sites*.
- Institute of Air Quality Management (2024) *Guidance on the assessment of dust from demolition and construction, January 2024 Version 2.2*.
- Institute of Air Quality Management (IAQM) (2018) *Guidance on the assessment of odour for planning*.
- Institute for Archaeologists Wales. (2022). A Research Framework for the Archaeology of Wales Version 04, August 2022 – Maritime. [Online] Available at <https://www.archaeolog.org.uk/pdf/review2024/VERSION%2004%20Maritime.pdf>.
- Institute of Environmental Management and Assessment (2014) *Guidelines for Environmental Noise Impact Assessment*.
- Institute of Environmental Management and Assessment (IEMA), (2020), *Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation*. Available at: <chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.iema.net/media/mabhqino/iema-eia-climate-change-resilience-june-2020.pdf>. (Accessed 17th February 2026).
- Institute of Environmental Management and Assessment (now Institute of Sustainability and Environmental Professionals (ISEP)) (2022a) *A New Perspective on Land and Soil in Environmental Impact Assessment*
- Institute of Environmental Management and Assessment, Institute of Historic Building Conservation and Chartered Institute for Archaeologists. (2021). *Principles of Cultural Heritage Impact Assessment in the UK*. [Online] Available at: <https://www.ihbc.org.uk/brighton2021/resources/Principles-of-CHIA-V2%5B4%5D.pdf>.
- Institute of Sustainability and Environmental Professionals (ISEP) (2022b) *Assessing greenhouse gas emissions and evaluating their significance*.
- Institute of Sustainability and Environmental Professionals (ISEP) (2025) **Soil health and environmental assessment**. Lincoln: Institute of Sustainability and Environmental Professionals.
- Institution of Environmental Sciences (2020) **Sustainable, healthy and resilient: practice-based approaches to land and soil management**. London: Institution of Environmental Sciences.
- International Association of Lighthouse Authorities (2025). *Guideline G1162, Ed1.0 - The marking of offshore man-made structures*.
- International Maritime Organisation (1972). *COLREGs*.
- International Maritime Organisation (1974). *International Convention for the Safety of Life at Sea (SOLAS)*.
- International Maritime Organisation's (2025). *Formal Safety Assessment (FSA)*.

Intertek (2018). Marine Ecology Baseline Review. Intertek Energy & Water Consultancy Services.

ISEP (2025). Delivering proportionality in impact assessment: ISEP's IA Outlook Journal Volume 24, Institute of Sustainability and Environmental Professionals (ISEP) blog, 27 March. Available at: <https://www.isepglobal.org/resources/blogs/2025/march/delivering-proportionality-in-impact-assessment-iseps-ia-outlook-journal-volume-24/> (Accessed: 25 May 2026).

JNCC (2025a). UK Atlas of Seabed Habitats | JNCC - Adviser to Government on Nature Conservation. [online] Jncc.gov.uk. Available at: <https://jncc.gov.uk/our-work/uk-atlas-of-seabed-habitats-ukash/>.

JNCC (2025b). Uk Protected Areas. Available at: UK Protected Areas | Advisor to Government on Nature Conservation | JNCC

JNCC and BTO (2025). Seabird Monitoring Programme Online Database. Available at: <https://app.bto.org/seabirds/public/index.jsp>

JNCC and Natural England (2011). General advice on assessing potential impacts of and mitigation for human activities on MCZ features, using existing regulation and legislation

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. and Burton, N.H.K. (2014a). Modelling flight heights of marine birds to more accurately assess collision risk with offshore wind turbines. *Journal of Applied Ecology*, 51. Doi: 10.1111/1365-2664.12191

Johnston, A., Cook, A.S.C.P., Wright, L.J., Humphreys, E.M. and Burton, N.H.K. (2014b). Corrigendum. *Journal of Applied Ecology*, 51. Doi: 10.1111/1365-2664.12260

Joint Nature Conservation Committee (JNCC) (2008) Common standards monitoring guidance for terrestrial and freshwater invertebrates.

Joint Nature Conservation Committee (JNCC). (2015). Pembrokeshire Marine/ Sir Benfro Forol SAC. STANDARD DATA FORM for sites within the 'UK national site network of European sites'.

Joint Nautical Archaeology Policy Committee (JNAPC) (2006) *JNAPC Code of Practice for Seabed Development*. Portsmouth: Joint Nautical Archaeology Policy Committee. Available at: https://www.historicenvironment.scot/media/2374/jnadc_brochure_may_2006.pdf

Kantar TNS (2025a). GB Day Visitor 2024 report, domestic day visits [online] Available at: <https://www.visitbritain.org/research-insights/great-britain-domestic-day-visits-latest-results> (Accessed: February 2026).

Kantar TNS (2025b). GB Tourist 2024 report, domestic overnight trips [online] Available at: <https://www.visitbritain.org/research-insights/great-britain-domestic-overnight-trips-latest-results> (Accessed: February 2026).

Kjelland, M.E., Woodley, C.M., Swannack, T.M. and Smith, D.L. (2015). A review of the potential effects of suspended sediment on fishes: potential dredging-related physiological, behavioral, and transgenerational implications. *Environment Systems and Decisions*, 35(3), pp.334–350. doi:<https://doi.org/10.1007/s10669-015-9557-2>.

Lambkin, D.O., Harris, J.M., Cooper, W.S. and Coates, T. (2009). Coastal Process Modelling for OWF Environmental Impact Assessment: Best Practice Guide. Report to COWRIE, September 2009.

Land Use Consultants (2018) on behalf of Marine Management Organisation (MMO). MMO 1134: Seascape Character Assessment for the Southwest Inshore and Offshore marine plan areas, September

2018. Available at: [South_West_-_Seascape_character_assessment_report.pdf](#)

Landscape Institute (2013). Guidelines for Landscape and Visual Assessment 3RD Edition (GLVIA3), including clarifications (Technical Guidance Note LITGN-2024-01 (August 2024). Available at: [LITGN-2024-01-GLVIA3-NC_Aug-2024.pdf](#). (Accessed: February 2026)

Landscape Institute (2019a). Technical Guidance Note 2/19 Residential Visual Amenity Assessment, March 2019. Available at: [tgn-02-2019-rvaa.pdf](#). (Accessed February 2026)

Landscape Institute (2019b). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19 (under review, January 2024). Available at: [TGN-06-19-Visual_Representation](#). (Accessed: February 2026)

Landscape Institute (2021). Technical Guidance Note 2/21 Assessing landscape value outside of national designations. Available at: [tgn-02-21-assessing-landscape-value-outside-national-designations.pdf](#). (Accessed: February 2026)

Landscape Institute and Institute of Environmental Management and Assessment (IEMA) (2013) Guidelines for LVIA (3rd edn), including 2024 clarifications.

Lewis, J. (2021) *Sustainable, Healthy and Resilient: Practice-Based Approaches to Land and Soil Management*. London: Institution of Environmental Sciences (IES). Available at: https://www.the-ies.org/sites/default/files/reports/ies_report_-_hq_for_website.pdf

Lindeboom, H.J., Kouwenhoven, H.J., Bergman, M.J.N., Bouma, S., Brasseur, S., Daan, Fijn, R.C., de Haan, D., Dirksen, S., van Hal, R, Hille Ris Lambers, R, ter Hofstede, Krijgsveld, R.K.L., Leopold, M. and Scheidat, M. (2011). Short-term ecological effects of an OWF in the Dutch coastal zone; a compilation. *Environ. Res. Lett.* 6 (3).

Llŷr Floating Wind Ltd (2022). *Llŷr Screening and Scoping Report: - Llŷr*. [online] Llŷr. Available at: <https://www.llyrwind.com/news/llyr-screening-and-scoping-report> (Accessed: June 2026).

Llŷr Floating Wind Ltd. (2024) *Llŷr Floating Offshore Wind Project: Environmental Statement*. Available at: <https://www.llyrwind.com/environment-statement> (Accessed: February 2026)

Lock K, Newman P, Burton M & Jones J, (2017). Skomer MCZ Grey Seal Survey, Marloes Peninsula 1992 – 2016. NRW Evidence Report 195.

Lohrengel, K., Evans, P.G.H., Lindenbaum, C.P., Morris, C.W., Stringell, T.B. (2018). Bottlenose Dolphin Monitoring in Cardigan Bay 2014 - 2016, NRW Evidence Report No: 191, 162pp, Natural Resources Wales, Bangor.

MAGIC (2026). Available at: <https://magic.defra.gov.uk/>. (Accessed March 2026)

MAIB (1997), Accident Investigation Report: Sea Empress

Manx Wildlife Trust (2024). Basking shark | Manx Wildlife Trust. [online] [Www.mwt.im](http://www.mwt.im). Available at: <https://www.mwt.im/wildlife-explorer/marine/fish-including-sharks-skates-and-rays/basking-shark> (Accessed: 19 March 2026).

Marine Environmental Data and Information Network (MEDIN) (2025). MEDIN data discovery portal. Available at: <https://portal.medin.org.uk/portal/start.php> (Accessed: June 2026).

Maritime Archaeology Ltd. (2025a). The Crown Estate Celtic Sea Floating Wind Project. Marine Archaeology Technical Report Project Development Area 1. Project number: 1911, June 2025.

Maritime Archaeology Ltd. (2025b). The Crown Estate Celtic Sea Floating Wind Project Archaeological assessment of geotechnical cores Phase 1 and 2. Project number: 1911, November 2025.

Maritime Archaeology Ltd. (2025c). The Crown Estate Celtic Sea Floating Wind Project Archaeological assessment of geotechnical cores Phase 3. Project number: 1911, November 2025.

Maxwell, S.M., Kershaw, F., Locke, C.C., Conners, M.G., Dawson, C., Aylesworth, S., Loomis, R. and Johnson, A.F. (2022) 'Potential impacts of floating wind turbine technology for marine species and habitats', *Journal of Environmental Management*, 307, 114577. Available at: <https://doi.org/10.1016/j.jenvman.2022.114577>

MMO (2026). Monthly UK Sea Fisheries Statistics (Landings Data). Available at: <https://www.gov.uk/government/collections/uk-sea-fisheries-annual-statistics> (Accessed: February 2026).

Marine Archaeology Limited (2025) Geophysical Survey Report, The Crown Estate. Not publicly available.

Marine Archaeology Limited (2025) Geotechnical Stage 1 and Stage 2 Survey Report, The Crown Estate. Not publicly available.

Marine Archaeology Limited (2025) Geotechnical Stage 3 Survey Report, The Crown Estate. Not publicly available.

Marine Scotland (2012). Marine Scotland Offshore Renewables Research: Work Package A3: Request for advice about the displacement of marine mammals around operational offshore windfarms. Available at: <http://www.gov.scot/Resource/0040/00404921.pdf>.

Maritime and Coastguard Agency (2021). Marine Guidance Note (MGN) 654 Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response (and its annexes).

Maritime and Coastguard Agency (2022). MGN 372 Amendment 1 Offshore Renewable Energy Installations (OREIs) - Guidance to Mariners operating in the vicinity of UK OREIs.

MarramWind (2026). Environmental Impact Assessment Report Volume 1, Chapter 13: Fish Ecology. [online] Marram Wind. Available at: https://www.marramwind.co.uk/userfiles/file/MarramWind_ (Accessed: February 2026).

MCA (2021). MGN 654 (M+F): Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response. Available at: <https://www.gov.uk> (Accessed: 25 May 2026)

MCA (2024). Offshore Renewable Energy Installations: Requirements, guidance and operational considerations for SAR and Emergency Response (MGN 654 Annex 5). Available at: https://assets.publishing.service.gov.uk/media/65a695fc640602000d3cb75d/OREI_SAR_Requirements_v4_.pdf

McConnell, B., Lonergan, M. and Dietz, R. (2012). Interactions between seals and offshore wind farms. The Crown Estate. ISBN: 978-1-906410-34-5.

MEDIN (2025). MEDIN Discovery Metadata Portal. [online] Medin.org.uk. Available at: <https://portal.medin.org.uk/portal/start.php>.

Merchant, N., Putland, R., Roberts, G., Veneruso, G. 2025. Welsh Acoustic Marine Mammal Survey Final Field Report and Data Analysis. NRW Evidence Report, Report No: 860, 74pp, Natural Resources Wales, Bangor.

Met Office (2018). UK Climate Projections 2018 (UKCP18). Exeter: Met Office Hadley Centre.

Met Office (2019) UK Climate Projections 2018 (UKCP18) data. Available at: <https://ukclimateprojections.metoffice.gov.uk/> (Accessed: 3 June 2026).

Met Office (2020a). *Location-specific long-term averages - Station: Tenby*. Available at: <https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-averages/gchtuvv5y>. (Accessed 17th February 2026).

Met Office, (2020b). *Location-specific long-term averages - Station: Pembrey Sands*. Available at: Pembrey Sands Location-specific long-term averages. (Accessed on 18th February 2026).

Milford Haven Port Authority (2016), About the Port of Milford Haven. Available at: https://www.mhpa.co.uk/about/?_gl=1*t99c1k*_up*MQ..*_ga*MTAzODkzOTMzMS4xNzcxNDk3MjY1*_ga_W8M7CQT6J1*cze3NzE0OTcxNjQkbzEkZzAkDE3NzE0OTcxNjQkajYwJGwwJGgw (Accessed 19 February 2026).

Mining Remediation Authority (2026) Map Viewer. Available at: <https://datamine-cauk.hub.arcgis.com/>

Ministry of Agriculture, Fisheries and Food (MAFF) (1988) *Agricultural land classification of England and Wales: guidelines and criteria for grading the quality of agricultural land*. Revised guidelines. London: MAFF.

MMO (2013). Marine conservation zones and marine licensing. [Online]. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/410273/Marine_conservation_zones_and_marine_licensing.pdf (Accessed January 2026)

MOD (2020). MOD Obstruction Lighting Guidance'. Available at: <https://www.contarnex.com/infrared-obstruction-lighting/MOD%20Obstruction%20Lighting%20Guidance%202020.pdf>

MOD (2026). UK Military Aeronautical Information Publication. Available at: <https://www.aidu.mod.uk/aip/index.html>

Mona Offshore Wind Limited (2024) Mona Offshore Wind Project Environmental Statement. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010137/documents> (Accessed: 18 June 2026).

Morgan LH, Morris CW, Stringell TB. (2018). Grey Seal Pupping Phenology on Ynys Dewi / Ramsey Island, Pembrokeshire. NRW Evidence Report No: 156, 22 pp, Natural Resources Wales, Bangor.

Morris, C.D, Riddoch, N.G., Duck, C.D., Waitland, S.A. & Russell, D.J.F. (2025). Aerial thermal-imaging survey of seals in Ireland in August 2024. Irish Wildlife Manuals, No. 158. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

National Assembly for Wales (2007) Part 2A Statutory Guidance on Contaminated Land

National Energy System Operator (NESO) (2024) Clean Power 2030 Action Plan.

National Highways (2021). CD 123 - Geometric design of at-grade priority and signal - controlled junctions. Design Manual for Roads and Bridges (DMRB). Available at: <https://www.standardsforhighways.co.uk/search/962a81c1-abda-4424-96c9-fe4c2287308c>. (Accessed February 2026)

National Highways (2024). *Design Manual for Roads and Bridges LA105 Air quality (vertical barriers)*. Available at: <https://standardsforhighways.co.uk/dmrb>. (Accessed February 2026)

NATS (2012). Self-assessment maps. Available at: <https://www.nats.aero/our-solutions/wind-farms/n/wind-farms-self-assessment-maps/>

Natural England (2012). *An Approach to Seascape Character Assessment*, October 2012. Available at: [seascape-character-assessment.pdf](#)

Natural England (2014). *National Landscape Character Assessment*. Available at: [National England - National Character Area Profiles - National Character Area Profiles](#)

Natural England (2018a). *Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations (NEA001)*

Natural England (2018b). *An Approach to Landscape Character Assessment*, October 2014. Available at: [landscape-character-assessment.pdf](#) (Accessed February 2026)

Natural England (2022a). *Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards: Phase I: Expectations for preapplication baseline data for designated nature conservation and landscape receptors to support offshore wind applications.*

Natural England (2022b). *Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards: Phase III: Expectations for data analysis and presentation at examination for offshore wind applications*

NatureScot (2017a). *Siting and Designing Windfarms in the Landscape (Version 3a)*, August 2017.

NatureScot (2017b). *Visual Representation of Wind Farms, Version 2.2*, February 2017. Available at: <https://www.nature.scot>

NatureScot (2020). *Guidance note 9 – Guidance to support offshore wind applications: seasonal periods for birds in the Scottish marine environment*. Available at: <https://www.nature.scot/doc/guidance-note-9-guidance-support-offshore-wind-applications-seasonal-periods-birds-scottish-marine>

NatureScot (2021). *Assessing the Cumulative Impact of Onshore Wind Energy Developments*, March 2021. Available at: <https://www.nature.scot/doc/guidance-assessing-cumulative-landscape-and-visual-impact-onshore-wind-energy-developments>

NatureScot (2024). *Guidance on Aviation Lighting Impact Assessment*, November 2024. Available at: [Guidance on Aviation Lighting Impact Assessment | NatureScot](#)

NatureScot (2025). *Guidance for Assessing the Effects on Special Landscape Qualities*, January 2025. Available at: [Special Landscape Qualities - Guidance on assessing effects | NatureScot](#) (Accessed February 2026)

NBN Atlas Wales (no date). *NBN Atlas Wales*. National Biodiversity Network Trust. Available at: <https://wales.nbnatlas.org/> (Accessed: February 2026)

Neath Port Authority (2022), *Pilotage Directions, Pilotage Act 1987 (sections 7 & 8)*. Available at [Neath Port Authority, Port Information \(2026\)](#). Available at: <https://www.neathport.com/port-information/general> (Accessed: February 2026).

NESO (2024). *Beyond 2030*. Available at: <https://www.neso.energy/publications/beyond-2030> (Accessed: 22 May 2026).

New York State Energy Research and Development Authority (NYSERDA) (2021) Study.

NIRAS (2023). MCZ Screening Principles. Available at: <https://experience.arcgis.com/experience/7fcae430c7f24b28b65a072065ef9d90/> (Accessed February 2026)

NIRAS (2024). Addendum to the Offshore Wind Leasing Round 5 RIAA. Available at: <https://experience.arcgis.com/experience/f28432d050ec466eb0041561351e2dea/page/Introduction/>

NPWS (2026). Protected sites in Ireland. Available at: Protected Sites in Ireland | National Parks and Wildlife Service

NRW (n.d.). Find protected areas of land and sea. Available at: <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/?lang=en> (Accessed: June 2026)

NRW (2015). National Seascape Assessment for Wales, Evidence Report No: 80, November 2015. Available at: National Seascape Assessment for Wales

NRW (2018). Marine Invasive Non-native Species Priority Monitoring and Surveillance List for Wales

NRW (2019a). South West Wales Area Statement. Available at: <https://naturalresources.wales/about-us/what-we-do/strategies-plans-and-policies/area-statements/south-west-wales-area-statement/?lang=en> (Accessed 01 December 2025)

NRW (2019b). Marine Area Statement. Available at: <https://naturalresources.wales/about-us/what-we-do/strategies-plans-and-policies/area-statements/marine-area-statement/?lang=en> (Accessed 01 December 2025)

NRW (2020) Flood Map for Planning. Available at: Flood Map for Planning. (Accessed April 2026)

NRW (2021a) Ancient Woodland Inventory (WOM21).

NRW (2021b). LANDMAP Guidance Note 46: Guidance for Wales, Using LANDMAP in Landscape and Visual Impact Assessments. Available at: NRW / Using LANDMAP in Landscape and Visual Impact Assessments GN46 (Accessed: February 2026)

NRW (2022). Western Wales River Basin Management Plan 2021 – 2027 Summary.

NRW (2023a). Guidance Note: At sea ornithological survey guidance. Marine Programme Planning and Delivery Group. Available at: <https://cdn.cyfoethnaturiol.cymru/695080/at-sea-ornithological-guidance-checked-accessible.pdf>

NRW (2023b) Development of Land Affected by Contamination: A Guide for Developers

NRW (2023c). *Climate Change Risk Assessment Framework for Public Services Boards*. Available at: 07b-Climate-Change-Risk-Assessment-Framework.pdf. (Accessed on 18th February 2026).

NRW (2024) Environment (Wales) Act Section 7 terrestrial habitats of principal importance. Available at: [URL] (Accessed: 3 June 2026).

NRW (2025). DataMapWales. Available at: <https://datamap.gov.wales/> (Accessed February 2026)

NRW (2025a). Guidance on best practice for marine and coastal physical processes baseline survey and monitoring requirements to inform EIA of major development projects. Evidence Report No. 243. Available at: <https://cdn.naturalresources.wales/689057/guidance-on-best-practice-for-marine-and->

coastal-physical-processes-baseline-survey-and-monitoring-requirements-to-inform-eia-of-major-development-projects.pdf>

NRW (2025b). Benthic habitat assessments for marine developments. Available at: <https://naturalresourceswales.gov.uk/guidance-and-advice/business-sectors/marine/benthic-habitat-assessments-for-marine-developments/?lang=en> (Accessed: February 2026)

NRW (2026a). Climate resilient fisheries: a strategy for the sustainable management of migratory and freshwater fishes and fisheries of Wales, 2026–2031. Natural Resources Wales.

NRW (2026b). *Guidance on Environmental Assessment*.

NRW (2026c). Source Protection Zones (SPZ) Merged
https://metadata.naturalresources.wales/geonetwork/srv/api/records/NRW_DS116230?language=eng. (Accessed February 2026)

NRW (no date (a)) LANDMAP: the Welsh landscape baseline.

NRW (no date (b)). Marine development. Available at: <https://naturalresources.wales/guidance-and-advice/business-sectors/marine/?lang=en> (Accessed: February 2026)

NRW (no date (c)). Marine licensing in Wales. Available at: <https://naturalresources.wales/permits-and-permissions/marine-licensing/marine-licensing-in-wales/?lang=en> (Accessed: June 2026).

NRW, NIEA, SEPA and the Oil Care Campaign (2022). Guidance for Pollution Prevention. Available at: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/> (Accessed: 16 February 2026)

NSTA (2025). NSTA Offshore Zipped Shapefiles ETRS89.
<https://www.arcgis.com/home/item.html?id=10bbf71d92d04b0d81a66b738cd4c18d>

Ocean Ecology (2025). SEAABEDD Initiative Seabed Environmental Assessments for Accelerating Blue Economy Developments & Decommissioning

Offshore Renewable Energy Catapult (2021). Offshore Wind Operations & Maintenance [online] Available at: https://cms.ore.catapult.org.uk/wp-content/uploads/2021/05/Catapult-Offshore-Wind-OM_final-050521.pdf (Accessed: February 2026).

Offshore Wind Evidence & Knowledge Hub (OWEKH) (2026). Evidence Review Note: Seascape, Landscape & Visual Impact. Available at: [2026 OWEKH Evidence Review Note_Seascape.pdf](#)

Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M. (2000) Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*). *Herpetological Journal*, 10, pp. 143–155.

ONS (2024). Population estimates – local authority based by single year of age [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates> (Accessed: February 2026).

ONS (2025a). Annual Survey of Hours and Earnings – resident analysis [online] Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/adhocs/2934annualsurveyofhoursandearningsestimatesofearningsofresidencebasedemployeesbycombinedauthorities> (Accessed: February 2026).

- ONS (2025b). Housing affordability in England and Wales: 2024 [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/bulletins/housingaffordabilityinenglandandwales/2024> (Accessed: February 2026).
- ONS (2025c). National population projections: 2022 -based [online] Available at: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections> (Accessed: February 2026).
- ONS (2025d). Business Register and Employment Survey [online] Available at: <https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/businessregisterandemploymentsurvey> (Accessed: February 2026).
- ONS (2025e). Annual Population Survey [online] Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/methodologies/annualpopulationsurveyapsqmi> (Accessed: February 2026).
- ORE Catapult (2025). At a Crosswind: Could hybrid substructures redefine ‘floating’ offshore wind in the UK?. Published 2 Sept 2025. Accessed 15 May 2026. Available from At a Crosswind: Could hybrid substructures redefine ‘floating’ offshore wind in the UK?
- OSPAR (2009). Assessment of the Environmental Impacts of Cables. OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. Available at: https://www.noaa.gov/sites/default/files/2025-07/p00437_Cables.pdf
- OSPAR Commission (2023). Quality Status Report 2023 – Synthesis Report. Available at: <https://oap.ospar.org/en/ospar-assessments/quality-status-reports/qsr-2023/synthesis-report/introduction/> (Accessed: November 2025).
- OWEKH. (2026a). Evidence Review Note: Marine Historic Environment. [Online] Available at: https://cms.owekh.com/media/Evidence%20Review%20Notes/2026%20OWEKH%20Evidence%20Review%20Note_Marine%20Historic%20Environment.pdf.
- OWEKH (2026b). Evidence Review Note: Shipping and Navigation. Available at: https://cms.owekh.com/media/Evidence%20Review%20Notes/2026%20OWEKH%20Evidence%20Review%20Note_Shipping%20and%20Navigation.pdf (Accessed: February 2026).
- OWIC (2025). Wind Industry Skills Intelligence Report [online] Available at: https://www.renewableuk.com/media/jvsdey0k/ruk-owic-offshore-wind-skills-report_2025.pdf (Accessed: February 2026).
- Oxford Archaeology. (2008). Guidance for the Assessment of Cumulative Impacts on the Historic Environment from Offshore Renewable Energy. Guidance prepared by Oxford Archaeology and issued by COWRIE. [Online] Available at: <http://www.biofund.org.mz/wp-content/uploads/2018/11/F1349.Cowrie-Ciarch-Web.pdf>.
- Parker, J., Banks, A., Fawcett, A., Axelsson, M., Rowell, H., Allen, S., Ludgate, C., Humphrey, O., Baker, A., Copley, V., Farmer, R. and Foote, Y. (2025a). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications. Natural England. Version 2. 79 pp.
- Parker, J., Fawcett, A., Banks, A., Rowson, T., Allen, S., Rowell, H., Harwood, A., Ludgate, C., Humphrey, O., Axelsson, M., Baker, A., Copley, V., Robertson, A., Hodgkiss, R., Berridge, R. and Farmer R. (2025b). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards.

Phase III: Expectations for data analysis and presentation at examination for offshore wind applications. Natural England. Version 2. 140 pp.

Paxton, C.G.M., Scott-Hayward, L., Mackenzie, M., Rexstad, E. and Thomas, L. (2016). Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resources with Advisory Note, JNCC Report 517, ISSN 0963-8091: <http://jncc.defra.gov.uk/page-7201>.

PCC (2013). Local Development Plan – Planning Pembrokeshire’s Future

PCC (2016). Contaminated Land Inspection Strategy.

PCC (2019). Landscape Character Assessment, Consultation Draft (July 2019). Available at: [Landscape Character Assessment July 2019 - PCC](#) (Accessed February 2026)

PCC (2025) *Pembrokeshire Council 2025 Air Quality Progress Report*

Peay, S. (2003) Monitoring the white-clawed crayfish.

Pembrokeshire Coast National Park (PCNP) (2018). Management Plan (2015-2019), Background Paper (Special Qualities of the PCNP) (March 2018). Available at: [Issues and Options for Renewable Energy](#) (Accessed: February 2026)

Pembrokeshire Coast National Park (PCNP) (2020). Local Development Plan 2. Available at: [Local Development Plan 2 - Pembrokeshire Coast National Park](#) (Accessed February 2026)

Pembrokeshire Coast National Park (PCNP) (2024). Partnership Plan 2025-2029. Available at: [Partnership Plan 2025-2029 - Pembrokeshire Coast National Park](#) (Accessed: February 2026)

Pembrokeshire Coast National Park Authority (2011). Landscape Character Assessment - Supplementary Planning Guidance (Working Draft, Adopted 22 June 2011). Available at: [LCAIntroFinal2011E.pdf](#) (Accessed: February 2026)

Pembrokeshire County Council (2019). Landscape Character Assessment, Consultation Draft (July 2019). Available at: [Landscape Character Assessment July 2019 - Pembrokeshire County Council](#)

Phillips, J.A., Banks, A.N., Bolton, M., Brereton, T., Cazenave, P., Gillies, N., Padget, O., van der Kooij, J., Waggitt, J. & Guilford, T. (2021). Consistent concentrations of critically endangered Balearic shearwaters in UK waters revealed by at-sea surveys. *Ecology and Evolution*, 11, pp.1544–1557. <https://doi.org/10.1002/ece3.7059>

Popper, A., Hawkins, A., Fay, R., Mann, D., Bartol, S., Carlson, T., Coombs, S., Ellison, W., Gentry, R., Halvorsen, M., Lokkeborg, S., Rogers, P., Southall, B., Zeddies, D., and Tavalga, W (2014). Sound exposure guidelines for fishes and sea turtles. Fisheries and Aquatic Biology Laboratory, University of Maryland.

Pye, K. & Blott, S.J. (2009) Coastal processes and shoreline behaviour of estuary dominated systems in Swansea Bay and Carmarthen Bay. Report prepared for Halcrow Group Ltd. Crowthorne: K. Pye Associates.

Research Framework for the Archaeological of Wales, (2016) The Palaeolithic and Mesolithic (250,000 BC - 4,000 BC) Available at: <https://archaeoleg.org.uk/pdf/paleolithic/KEY%20SITES%20SW%20WALES%20PALAEOLITHIC%20AND%20MESOLITHIC.pdf> [Accessed 10.02.2026]

Richie, M (2018). A Brief Introduction to Iron Age Settlement in Wales, *Internet Archaeology* 48. Available at: <https://intarch.ac.uk/journal/issue48/2/1.htmlv> (Accessed February 2026)

RNLI, Find my nearest lifeboat station. Available at: <https://rnli.org/find-my-nearest/lifeboat-stations> (Accessed: February 2026).

Rodwell, J.S. (1991–2000) British plant communities, Volumes 1–5. Cambridge University Press.

Rodwell, J.S. (2006) National Vegetation Classification users' handbook. Joint Nature Conservation Committee.

RPS (2019). Review of Cable Installation, Protection, Mitigation and Habitat Recoverability. The Crown Estate

Russell, D.J.F. and McConnell, B.J. (2014). Seal at-sea distribution, movements and behaviour. Report to DECC. URN: 14D/085. March 2014 (final revision).

RWE Renewables UK Swindon Limited. (2023). Awel y Môr Offshore Wind Farm. Category 6: Environmental Statement Volume 2, Chapter 7: Marine Mammals. Deadline 8. Date: 15 March 2023. Revision: D. Document Reference: 8.66.

S. Eisfeld-Pierantonio, V. James (Whale and Dolphin Conservation). (2018). Risso's dolphins of Ynys Enlli / Bardsey Island: Photo-ID catalogue. NRW Evidence Report No: 261, 17 pp, Natural Resources Wales, Bangor.

Scheidat, M., Tougaard, J., Brasseur, S., Carstensen, J., van Polanen Petel, T., Teilmann, J., and Reijnders, P. (2011). Harbour porpoise (*Phocoena phocoena*) and wind farms: a case study in the Dutch North Sea. Environ. Res. Lett. 6 (April-June 2011) 025102.

SCOS (2024). Scientific advice on matters related to the management of seal populations: 2024. Natural Environment Research Council Special Committee on Seals.

SCOS (2025). Scientific advice on matters related to the management of seal populations: 2025. Natural Environment Research Council Special Committee on Seals.

Searle, K., Mobbs, D., Daunt, F., and Butler, A. (2019). A Population Viability Analysis Modelling Tool for Seabird Species. Centre for Ecology and Hydrology report for Natural England. Natural England Commissioned Report NECR274.

Sharples R.J., Matthiopoulos, J. and Hammond, P.S. (2008). Distribution and movements of harbour seals around the coast of Britain: Outer Hebrides, Shetland, Orkney, the Moray Firth, St Andrews Bay, The Wash and the Thames, Report to DTI July 2008.

SIARC (2026). What is Project SIARC. [online] SIARC. Available at: <https://www.projectsarc.com/>.

Skov, H., Heinänen, S., Norman, T., Ward, R.M., Méndez-Roldán, S. and Ellis, I. (2018). ORJIP Bird Collision and Avoidance Study. Final report – April 2018. The Carbon Trust, United Kingdom.

Swansea and Carmarthen Bay Coastal Engineering Group (2012) Shoreline Management Plan 2 (Lavernock Point to St Ann's Head). Available at: <https://docslib.org/doc/7123911/sww03-shoreline-management-plan-2-main> (Accessed: 1 June 2026).

Swansea Council (2017). Gower Area of Outstanding Beauty (AONB) Management Plan 2017. Available at: Gower - managed in partnership - Swansea (Accessed: February 2026)

Swansea Council (2019). Local Development Plan (LDP) 2010-2025. Available at: Swansea Local Development Plan 2010-2025 (LDP) - Swansea (Accessed: February 2026)

Tappin, D R., Mason, T. and Rocks, K. (2007). DTI Strategic Environmental Assessment Area 8 Superficial Seabed Processes and Hydrocarbon Prospectivity. Available at: <https://nora.nerc.ac.uk/id/eprint/12464/1/CR07075N.pdf>

Teilmann, J., Carstensen, J., Dietz, R., Edrén, S. and Andersen, S. (2006). Final report on aerial monitoring of seals near Nysted OWF Technical report to Energi E2 A/S. Ministry of the Environment Denmark.

The Carbon Trust (2024) Offshore wind industry product carbon footprinting guidance.

The Crown Estate. (2021). Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects. [Online] Available at:

<https://assets.ctfassets.net/nv65su7t80y5/7JCHxvKXAQPiXI32NvDFbH/7fab6a01c19b37149355f80646562/eca/guide-to-archaeological-requirements-for-offshore-wind.pdf>.

The Crown Estate (2024a). Floating Offshore Wind Leasing Round 5. Available at:

<https://www.thecrownestate.co.uk/our-business/marine/round-5> (Accessed: 29 April 2026).

The Crown Estate (2024b). Round 5 Plan HRA, Appropriate Assessment. Available at:

<https://www.marinedataexchange.co.uk/details/TCE-3960/2024-the-crown-estate-habitats-regulations-assessment-hra-round-5-floating-offshore-wind>

The Crown Estate (2025). *FLOWERS: Floating Offshore Wind Environmental Response to Stressors*. Offshore Wind Evidence and Change Programme. (Accessed: May 2026).

The Planning Inspectorate (2016). Application by Vattenfall Wind Power Ltd for an Order Granting Development Consent for the Norfolk Vanguard OWF Issue of Scoping Opinion. Available at:

<https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010079/EN010079-001922-6.04%20Scoping%20Opinion.pdf>

The Planning Inspectorate (2017a). SCOPING OPINION; Proposed Norfolk Boreas Offshore Wind Farm.

Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-000860-6.5%20Scoping%20Opinion.pdf>

The Planning Inspectorate (2017b). SCOPING OPINION: Proposed East Anglia ONE North Offshore Windfarm. Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010077/EN010077-001006-6.5%20EA1N%20Scoping%20Opinion.pdf>

The Planning Inspectorate (2017c). SCOPING OPINION: Proposed East Anglia TWO Offshore Windfarm.

Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010078/EN010078-001616-6.5%20EA2%20Scoping%20Opinion.pdf>

The Planning Inspectorate (2017d). Advice Note Eighteen: The Water Framework Directive. Available online Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive - GOV.UK (Accessed February 2026)

The Planning Inspectorate (2019). SCOPING OPINION: Proposed Dudgeon and Sheringham Shoal OWF Extensions. Available at [https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000006-](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000006-EQNR_Scoping%20Opinion%202017%20EIA%20Regs.pdf)

[EQNR_Scoping%20Opinion%202017%20EIA%20Regs.pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010109/EN010109-000006-EQNR_Scoping%20Opinion%202017%20EIA%20Regs.pdf)

The Planning Inspectorate (2025). Advice Note Nine: Using the Rochdale Envelope (version 3). Available at: <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/05/Advice-note-9.-Rochdale-envelope-web.pdf>

The Planning Inspectorate (2025). Advice Note Seventeen: Cumulative Effects Assessment (version 2). Available at <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/Advice-note-17V4.pdf>

The Road Vehicles (Authorisation of Special Types) (General) Order (2003). Available at: <https://www.legislation.gov.uk/uksi/2003/1998/contents> (Accessed February 2026)

Thomas, S. A. (2025). Urbanism in Roman Wales: A New Look at Roman Carmarthen. *Theoretical Roman Archaeology Journal*, 8(1).

Thomson, D. (2025). Census of grey seals (*Halichoerus grypus*) around Wales during August 2023 using aerial survey. NRW Evidence Report Series Report No: 865, 28pp, Natural Resources Wales, Bangor.

Tjørnløv, R.S., Skov, H., Armitage, M., Barker, M., Cuttat, F., Thomas, K. (2021). Resolving Key Uncertainties of Seabird Flight and Avoidance Behaviours at Offshore Wind Farms: Annual report for April 2020 – October 2020 (Report for AOWFL).

Tougaard, J., Carstensen, J. and Teilmann, J. (2009a). Pile driving zone of responsiveness extends beyond 20km for harbour porpoises (*Phocoena (L.) (L.)*). *J. Acoust. Soc. Am.*, 126, pp. 11-14.

Tougaard, J., Carstensen, J., Wisch, M.S., Teilmann, J., Bech, N., Skov, H. and Henriksen, O.D. (2005). Harbour porpoises on Horns reef — effects of the Horns Reef Wind farm. Annual Status Report 2004 to Elsam. NERI, Roskilde (Also available at: www.hornsrev.dk).

Tougaard, J., Henriksen, O.D. and Miller, L.A. (2009b). Underwater noise from three types of offshore wind turbines: estimation of impact zones for harbour porpoise and harbour seals. *Journal of the Acoustic Society of America* 125(6): 3766.

Transport for Wales (2026). Homepage | Transport for Wales. [online] tfw.wales. Available at: <https://tfw.wales/>. (Accessed February 2026)

TURTLE Database (2011), the database can be viewed via the UK Cetacean Strandings Investigation Programme, <http://ukstrandings.org/>.

Tyler-Walters, H., Tillin, H.M., d'Avack, E.A.S., Perry, F., Stamp, T., 2018. Marine Evidence-based Sensitivity Assessment (MarESA) – A Guide. Marine Life Information Network (MarLIN). Marine Biological Association of the UK, Plymouth, pp. 91. Available from <https://www.marlin.ac.uk/publications> (Accessed: 16 February 2026)

UK Government (2016) Environment (Wales) Act 2016, Section 7: Habitats and species of principal importance. London: The Stationery Office.

UK Government (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. London: The Stationery Office.

UK Government (2025). Education and Training Statistics for the UK [online] Available at: <https://www.gov.uk/government/statistics/education-and-training-statistics-for-the-uk-2025> (Accessed: February 2026).

UK Government (2026). The Green Book: UK Government Guidance on Appraisal [online] Available at: <https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-government> (Accessed: February 2026).

UKRI / NERC (2026). *Enabling Sustainable Wind Energy Expansion in Seasonally Stratified Seas (eSWEETS3)*. Grant reference NE/X004953/1.

Uncles, R.J. (1982) Computed and observed residual currents in the Bristol Channel. *Oceanologia Acta* 5, 11-20

van der Tempel, J., Zaaier, M.B. and Subroto, H. (2004) The effects of scour on the design of offshore wind turbines. Delft: Delft University of Technology. Available at: https://www.ocw.tudelft.nl/wp-content/uploads/Scour___MAREC_2004.pdf (Accessed: 3 June 2026).

Vincent, C., Huon, M., Caurant, F., Dabin, W., Deniau, A., Dixneuf, S., Dupuis, L., Elder, J.F., Fremau, M.H., Hassani, S. and Hemon, A., (2017). Grey and harbour seals in France: Distribution at sea, connectivity and trends in abundance at haulout sites. *Deep Sea Research Part II: Topical Studies in Oceanography*, 141, pp.294-305.

Visit Britain (2025). Annual Inbound Update GB Nations and Regions [online] Available at: <https://www.visitbritain.org/research-insights/inbound-visits-and-spend-annual-regional> (Accessed: February 2026).

Vousden, N. A. (2021). Early Medieval Ecclesiastical Sites in the Landscape of South-West Wales. University of Exeter (United Kingdom).

Waggitt, J.J., Evans, P.G., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J. and Felce, T. (2019). Distribution maps of cetacean and seabird populations in the North-East Atlantic. *Journal of Applied Ecology*, 57(2), pp.253-269. <https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2664.13525>.

Wakefield, E.D., Owen, E., Baer, J., Carroll, M.J., Daunt, F., Dodd, S.G., Green, J.A., Guilford, T., Mavor, R.A., Miller, P.I., Newell, M.A., Newton, S.F., Robertson, G.S., Shoji, A., Soanes, L.M., Votier, S.C., Wanless, S., Bolton, M. (2017). Breeding density, fine-scale tracking, and large-scale modeling reveal the regional distribution of four seabird species. *Ecological Applications* 27, 2074–2091. <https://doi.org/10.1002/eap.1591>

Wales INNS Group (2019) INNS Priority Species for Action in Wales list.

Walk Wheel Cycle Trust (2026). The National Cycle Network. [online] Sustrans. Available at: <https://www.sustrans.org.uk/national-cycle-network>.

Walker, E. A. (2018). Paleolithic archaeology of Wales: overview. *Encyclopedia of Global Archaeology*, 1-6.

Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. <https://www.legislation.gov.uk/uksi/2017/407/contents> (Accessed February 2026)

Water Worlds (no date). Celtic Sea. Available at: <https://waterworlds.info/water-body/celtic-sea/> (Accessed 13/02/2025)

Wells, K., Chanin, P. and Gubert, L. (2025) The hazel dormouse mitigation handbook.

Welsh Government (2019). The Welsh National Marine Plan. Cardiff: Welsh Government. Available at: <https://gov.wales> [Accessed: 5 February 2026].

Welsh Government (2020). Welsh National Marine Plan Implementation Guidance [online] Available at: <https://www.gov.wales/sites/default/files/publications/2020-06/welsh-national-marine-plan-implementation-guidance.pdf> (Accessed: February 2026).

Welsh Government (2021). 2018-based local authority population projections for Wales, 2018 to 2043 [online] Available at: <https://statswales.gov.wales/Catalogue/Population-and->

Migration/Population/Projections/Local-Authority/2018-based/populationprojections-by-localauthority-year (Accessed: February 2026).

Welsh Government (2022). Net Zero Strategic Plan. Available at: <https://www.gov.wales/sites/default/files/publications/2022-12/welsh-government-net-zero-strategic-...> (Accessed: June 2026)

Welsh Government (2023). Stronger, fairer, greener Wales: net-zero skills [online] Available at: <https://www.gov.wales/stronger-fairer-greener-wales-net-zero-skills> (Accessed: February 2026).

Welsh Government (2024). Resident Survey Pilot: Gwynedd, Pembrokeshire, and Vale of Glamorgan [online] Available at: <https://www.gov.wales/resident-survey-pilot-gwynedd-pembrokeshire-and-vale-of-glamorgan> (Accessed: March 2026).

Welsh Government (2025a). Welsh Language Standards: communication and marketing guidelines. Available at: <https://www.gov.wales/welsh-language-standards-communication-and-marketing-guidelines> (Accessed: 25 May 2026)

Welsh Government (2025b). Reeling in the benefits off Wales' first Bluefin Tuna Fishery | GOV.WALES. [online] GOV.WALES. Available at: <https://www.gov.wales/reeling-benefits-wales-first-bluefin-tuna-fishery> (Accessed: February 2026).

Welsh Government (2025c). Dwelling Stock by Local Authority and Tenure [online] Available at: <https://statswales.gov.wales/Catalogue/Housing/Dwelling-Stock-Estimates/dwellingstockestimates-by-localauthority-tenure> (Accessed: February 2026).

Welsh Government (2025d). Patients Registered at a GP Practice [online] Available at: <https://statswales.gov.wales/Catalogue/Health-and-Social-Care/General-Medical-Services/General-practice-population/patients-registered-at-a-gp-practice> (Accessed: February 2026).

Welsh Government (2025e). Energy Generation in Wales 2023 [online] Available at: <https://www.gov.wales/sites/default/files/publications/2025-02/energy-generation-in-wales-2023.pdf> (Accessed: February 2026).

Welsh Government (2025f). Domestic GB Tourism Statistics (overnight trips in Wales): 2024 [online] Available at: <https://www.gov.wales/domestic-gb-tourism-statistics-overnight-trips-wales-2024-html> (Accessed: February 2026).

Welsh Government (2026) DataMapWales. Available at: <https://datamap.gov.wales/> (Accessed: June 2026).

Welsh Government (2026). Press Release: New deal to unlock full potential of renewable energy in Wales. Available at: [New deal to unlock full potential of renewable energy in Wales | GOV.WALES](#) (Accessed: June 2026)

Welsh Government. (2024). Planning Policy Wales. Retrieved from gov.wales: <https://www.gov.wales/sites/default/files/publications/2024-07/planning-policy-wales-edition-12.pdf>

Wernham, C.V., Toms, M. P., Marchant, J. H., Clark, J. A., Siriwardena, G. M., and Baillie, S. R. (eds.) (2002). The Migration Atlas: Movements of the Birds of Britain and Ireland. Poyser, London.

Wales Health Impact Assessment Support Unit (WHIASU) (2012). Health Impact Assessment: A practical guide. Retrieved from WHIASU: <https://phwwhocc.co.uk/wp-content/uploads/2020/07/Health-Impact-Assessment-A-Practical-guide.pdf>

White Cross Offshore Wind (2023a). Environmental Statement – Chapter 11: Fish and Shellfish. Available at: <https://whitecrossoffshorewind.com/documents/>

White Cross Offshore Wind (2023b) Environmental Statement. Chapter 12: Marine Mammal and Marine Turtle Ecology. Available at: <https://whitecrossoffshorewind.com/wp-content/uploads/2023/09/FLO-WHI-REP-0002-12-Chapter-12-Marine-Mammal-and-Marine-Turtle-Ecology.pdf> White, S., Michaels, S. and King, H. (2019) *Seascape and visual sensitivity to offshore wind farms in Wales: Strategic assessment and guidance. Stage 3 – Seascape and visual sensitivity assessment for offshore wind farms*. NRW Evidence Series Report No. 331. Bangor: Natural Resources Wales.

Whitehouse, R.J.S. (1998) *Scour at marine structures: A manual for practical applications*. London: Thomas Telford.

Whitehouse, Richard J. S.; Harris, John M.; Sutherland, James; Mundon, T. R. (2010): *Scour at Offshore Structures*. In: Burns, Susan E.; Bhatia, Shobha K.; Avila, Catherine M. C.; Hunt, Beatrice E. (Hg.): *Proceedings 5th International Conference on Scour and Erosion (ICSE-5)*, November 7-10, 2010, San Francisco, USA. Reston, Va.: American Society of Civil Engineers. S. 11-20.

Wilson, B., Batty, R.S., Daunt, F. and Carter, C. (2007) *Collision Risks Between Marine Renewable Energy Devices and Mammals, Fish and Diving Birds*. Report to the Scottish Executive. Oban: Scottish Association for Marine Science Woodward, I.D., Thaxter, C.B., Owen, E., Bolton, M., Ward, R.M. and Cook, S.C.P. (2024). *The value of seabird foraging ranges as a tool to investigate the potential interactions within offshore wind farms*. *Ocean and Coastal Management*, 254.

World Health Organisation (1999) *Guidelines for community noise*. [online] www.who.int. Available at: <https://www.who.int/publications/i/item/a68672>

World Health Organisation (2009) *Night noise guidelines for Europe*. [online] www.who.int. Available at: <https://www.who.int/europe/publications/i/item/9789289041737>

World Health Organization (2018) *Environmental noise guidelines for the European Region*. [online] www.who.int. Available at: <https://www.who.int/europe/publications/i/item/97892890535>

Appendix A – Designated Sites for Nature Conservation

Table A 1 Statutory designated sites for nature conservation within and up to 5 km from the Terrestrial Ecology and Onshore Ornithology Study Area.

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
International sites (Ramsar sites)				
Bury Inlet	Ramsar	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site qualifies under Ramsar Criterion 5 due to supporting an internationally important assemblage of 41,655 waterfowl (5-year peak mean 1998/99 – 2002/03) over winter.</p> <p>The site qualifies under Ramsar Criterion 6 as it supports the following species occurring at levels of international importance:</p> <ul style="list-style-type: none"> ➤ Redshank <i>Tringa totanus</i> (peak counts in spring/ summer: 857 individuals, representing 0.7% of the GB population; five-year peak mean 1998/99 – 2002/03) ➤ Northern pintail <i>Anas acuta</i> (peak counts in winter: 2,687 individuals, representing 4.4% of the population; five-year peak mean 1998/99 – 2002/03)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ Oystercatcher <i>Haematopus ostralegus</i> (peak counts in winter: 14,861 individuals representing 1.4% of the population; five-year peak mean 1998/99 – 2002/03) ➤ Red knot <i>Calidris canutus</i> (peak counts in winter: 3,618 individuals, representing 1.2% of the GB population; five-year peak mean 1998/99 – 2002/03)
European sites SACs and SPAs				
Pembrokeshire Marine / Sir Benfro Forol	SAC	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Estuaries (1130) ➤ Large shallow inlets and bays (1160) ➤ Reefs (1170) <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Sand banks which are slightly covered by sea water all the time (1110) ➤ Mudflats and sandflats not covered by seawater at low tide (1140) ➤ Coastal lagoons (1150) ➤ Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) (1330)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ Submerged or partially submerged sea caves (8330) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Grey seal <i>Halichoerus grypus</i> (1364) ➤ Shore dock <i>Rumex rupestris</i> (1441) <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> ➤ Sea lamprey <i>Petromyzon marinus</i> (1095) ➤ River lamprey <i>Lampetra fluviatilis</i> (1099) ➤ Allis shad <i>Alosa alosa</i> (1102) ➤ Twaite shad <i>A. fallax</i> (1103) ➤ Otter <i>Lutra lutra</i> (1355)
Bristol Channel Approaches / Dynesfeydd Môr Hafren	SAC	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Harbour porpoise <i>Phocoena phocoena</i> (1351)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Limestone Coast of South West Wales / Arfordir Calchfaen De Orllewin Cymru	SAC	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Vegetated sea cliffs of the Atlantic and Baltic coasts (1230) ➤ Fixed coastal dunes with herbaceous vegetation (“grey dunes”) (2130) <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ European dry heaths (4030) ➤ Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (important orchid sites) (6210) ➤ Caves not open to the public (8310) ➤ Submerged or partially submerged caves (8330) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Greater horseshoe bat <i>Rhinolophus ferrumequinum</i> (1304) ➤ Early gentian <i>Gentianella anglica</i> (1654) <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> ➤ Petalwort <i>Petalophyllum ralfsii</i> (1395)

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Carmarthen Bay Dunes / Twyni Bae Caerfyrddin	SAC	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Embryonic shifting dunes (2110) ➤ Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (“white dunes”) (2120) ➤ Fixed coastal dunes with herbaceous vegetation (“grey dunes”) (2130) ➤ Dunes with <i>Salix repens sp. argentea</i> (<i>Salicion arenariae</i>) ➤ Humid dune slack (2190) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Narrow-mouthed whorl snail <i>Vertigo angustior</i> (1014) ➤ Petalwort (1395) ➤ Fen orchid <i>Liparis loeselii</i> (1903)
Carmarthen Bay and Estuaries / Bae Caerfyrddin ac Aberoedd	SAC	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Sandbanks which are slightly covered by sea water all the time (1110) ➤ Estuaries (1130) ➤ Mudflats and sandflats not covered by seawater at low tide (1140) ➤ Large shallow inlets and bays (1160)

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ <i>Salicornia</i> and other annuals colonising mud and sand (1310) ➤ Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) (1330) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Twaite shad (1103) <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> ➤ Sea lamprey (1095) ➤ River lamprey (1099) ➤ Allis shad (1102) ➤ Otter (1355)
Bae Caerfyrddin / Carmarthen Bay	SPA	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	The site qualifies under Article 4.2 of the EU Birds Directive by supporting overwintering common scoter <i>Melanitta nigra</i> (1% of the biogeographic region population, five-year peak mean 1997/98 – 2001/02).
Afon Tywi / River Tywi	SAC	Within Terrestrial Ecology and Onshore	Figure 3.1.2	Annex II species that are a primary reason for selection of this site: <ul style="list-style-type: none"> ➤ Twaite shad (1103)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Ornithology Study Area		<ul style="list-style-type: none"> ➤ Otter (1355) <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> ➤ Sea lamprey (1095) ➤ Brook lamprey <i>Lampetra planeri</i> (1096) ➤ River lamprey (1099) ➤ Allis shad (1102) ➤ Bullhead <i>Cottus gobio</i> (1163)
Skomer, Skokholm and the Seas off Pembrokeshire	SPA	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting the following during breeding season:</p> <ul style="list-style-type: none"> ➤ Storm petrel <i>Hydrobates pelagicus</i> (3,500 pairs, representing 4.1% of the GB population; count as at 1995) ➤ Chough <i>Pyrhocorax pyrrhocorax</i> (four pairs, representing 1.2% of the GB population; count as at 1998) ➤ Short-eared owl <i>Asio flammeus</i> (six pairs, representing 0.6% of the GB population; count as at 1998) <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting the following during breeding season:</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ Manx shearwater <i>Puffinus puffinus</i> (150,968 pairs, representing 5.9% of the global breeding population; count as at late 1990s) ➤ Puffin <i>Fratercula arctica</i> (9,500 pairs, representing 1.1% of the global breeding population; count as at mid 1980s) ➤ Lesser black-backed gull <i>Larus fuscus</i> (20,300 pairs, representing 16.4% of the breeding biogeographic region population; four-year mean 1993-1997). ➤ The site regularly supports at least 394,260 individual seabirds during the breeding season
Castlemartin Coast	SPA	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	The site qualifies under Article 4.1 of the EU Birds Directive by supporting breeding Chough (representing 3.5% of the GB population; count as at 1998).
Bury Inlet	SPA	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting the following overwintering:</p> <ul style="list-style-type: none"> ➤ Northern pintail (representing 3% of the population; five-year peak mean 1991/92 – 1995/96)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ Northern shoveler <i>Anas clypeata</i> (representing 3.6% of the GB population; five-year peak mean 1991/92 – 1995/96) ➤ Eurasian teal <i>A. crecca</i> (representing 0.3% of the GB population; five-year peak mean 1991/92 – 1995/95) ➤ Wigeon <i>A. penelope</i> (representing 0.6% of the GB population; five-year peak mean 1991/92 – 1995/96) ➤ Dunlin <i>Calidris alpina alpina</i> (representing 1.2% of the GB population; five-year peak mean 1991/92 – 1995/96) ➤ Red knot (representing 0.6% of the population; five-year peak mean 1991/92 – 1995/96) ➤ Oystercatcher (representing 1.6% of the population; five-year peak mean 1991/92 – 1995/96) ➤ Curlew <i>Numenius arquata</i> (representing 1.1% of the GB population; five-year peak mean 1991/92 – 1995/96) ➤ Grey plover <i>Pluvialis squatarola</i> (representing 0.8% of the GB population; five-year peak mean 1991/92 – 1995/96) ➤ Shelduck <i>Tadorna tadorna</i> (representing 1.3% of the GB population; five-year peak mean 1991/92 – 1995/96)

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<ul style="list-style-type: none"> ➤ Redshank (representing 0.3% of the population; five-year peak mean 1991/92 – 1995/96) <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting 34,962 waterfowl (five-year peak mean 1991/92-1995/96) over winter.</p>
Afonydd Cleddau / Cleddau Rivers	SAC	0.49km west	Figure 3.1.2	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Water course of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Bacthrachion</i> vegetation (3260) ➤ Active raised bogs (7110) ➤ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Saclion albae</i>) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Brook lamprey (1096) ➤ River lamprey (1099) ➤ Bullhead (1163) ➤ Otter (1355)

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Yeberston Tops	SAC	1.24km west	Figure 3.1.2	<p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caerulea</i>) (6410) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Marsh fritillary butterfly <i>Euphydryas</i> (syn. <i>Eurodryas</i>, <i>Hypodryas</i>) <i>aurinia</i> (1065)
Pembrokeshire Bat Sites and Bosherton Lakes / Safleoedd Ystlum Sir Benfro a Llynnoedd Bosherton	SAC	1.31km northwest	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. (3140) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Greater horseshoe bat (1304) <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> ➤ Lesser horseshoe bat <i>Rhinolophus hipposideros</i> (1303) ➤ Otter (1355)

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Gower Commons / Tiroedd Comin Gwyr	SAC	2.68km east	Figure 3.1.2	<p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Northern Atlantic wet heaths with <i>Erica tetralix</i> (4010) ➤ European dry heaths (4030) ➤ <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caeruleae</i>) (6410) <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> ➤ Southern damselfly <i>Coenagrion mercurial</i> (1044) ➤ Marsh fritillary butterfly (1065)
National sites SSSI(s), LNR(s) and NNR(s)				
Freshwater East Cliffs to Skrinkle Haven	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site comprises a largely south-facing stretch of coastline hosting a diverse mosaic of habitat features including low cliffs, steep vegetated slopes, rocky platforms and sheltered sandy bays. The site's varied geology supports rich maritime heath and grassland, extensive crevice vegetation, and dune systems. A range of nationally scarce and Red Data Book (Shirt, 1987) plant species (yarrow broomrape <i>Phelipanche purpurea</i> and golden hair lichen <i>Teloschistes flavicans</i>), Red Data Book and notable invertebrates, protected and notable ornithological species, and protected and notable reptile species are associated with such habitats.</p>
	LNR		Figure 3.1.2	

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				For geological interest features of this SSSI, see Section 3.2.
Stackpole Quay - Trewent Point	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site comprises moderately sheltered sea-cliffs. Bracken <i>Pteridium aquilinum</i> and gorse <i>Ulex europaeus</i> dominated scrub is present on the upper cliffs, with maritime grassland, crevice communities and maritime heath on the lower cliffs and headlands. The Red Data Book plant small restharrow <i>Ononis reclinata</i> occurs on one limestone headland with the variety of habitats also encouraging an abundance of protected and notable invertebrate species and breeding birds (chough and peregrine <i>Falco peregrinus</i>).</p> <p>For geological interest features of this SSSI, see Section 3.2.</p>
Lydstep Head to Tenby Burrows	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site is of special interest for its sea-cliff vegetation and for its numerous rare and scarce plants including five nationally rare species. Cliff vegetation present is a classic zonation of maritime vegetation grading from rock with lichens to crevice communities, and on to a mosaic of maritime, calcareous and neutral grassland and cliff scrub. The limestone grassland has a rich invertebrate assemblage, including the locally notable <i>Helicella itala</i>, Mediterranean snail <i>Theba pisana</i>, the woodlouse <i>Metoponorthus cingendus</i> and breeding small blue butterfly <i>Cupido minimus</i>. Ornithological features present include chough, stonechat <i>Saxicola torquata</i>, whitethroat <i>Sylvia communis</i>, fulmar <i>Fulmarus glacialis</i>, razorbill <i>Alca torda</i>, puffin <i>Fratercula arctica</i> and guillemot <i>Uria aalge</i>.</p>

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Cors Penally (Penally Marsh)	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>The site is designated for its diverse fen assemblage enclosed by ridges of carboniferous limestone and sand dunes, as well as the presence of various scarce fen plant species. The site is dominated by tall-fen communities. Towards the centre of the fen, which is less calcareous, several scarce plants occur and the vegetation is considered a rich-fen example of the <i>Molinia/Myrica</i> community, a habitat rarely encountered in Britain. Approximately 140 different plant species are found in the marsh, and botanical records for the site are well documented for over 130 years.</p>
Little Hoyle and Hoyle's Mouth Caves & Woodlands	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>Hoyle's mouth cave is known to regularly support the rare greater horseshoe and lesser horseshoe bat species, as well as Natterer's bat <i>Myotis nattereri</i>. The smaller Little Hoyle or Longbury Bank cave is known to support hibernating both greater and lesser horseshoe, Natterer's bat, brown long-eared bat <i>Plecotus auritus</i> and Daubenton's bat <i>Myotis daubentonii</i>. Steep Carboniferous Limestone slopes surrounding the caves support ash woodland which are an uncommon habitat in Pembrokeshire, confined to such sheltered Carboniferous Limestone slopes. These ash woodlands are structurally diverse and host well established communities of vegetation in their canopy, understorey and ground flora.</p> <p>For geological interest features of this SSSI, see Section 3.2.</p>
Ritec Fen	SSSI	Within Terrestrial Ecology and	Figure 3.1.2	<p>The site is of special interest for its extensive area of valley and floodplain fen, stretching for 2km on the north side of the River Ritec. A mosaic of wetland</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Onshore Ornithology Study Area		habitats is present across this area consisting of swamp, tall-herb fen, alder <i>Alnus glutinosa</i> and willow carr and wet meadows. These habitats host nationally scarce plant species such as marsh fern <i>Thelypteris palustris</i> and brown sedge <i>Carex disticha</i> , as well as several notable fly species <i>Anatella dampfi</i> , <i>Leia longiseta</i> and <i>Mycomya britteni</i> .
Wyndrush Pastures	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	The site is of special interest for its extensive areas of neutral and marshy grassland communities, interspersed with areas of broadleaved woodland, scrub, dry acidic grassland and tall-herb fen. The variety of habitats is present due to the pastures sloping gently north to north-eastwards, resulting in variable soil and drainage conditions. The site supports a variety of notable plant species include petty whin <i>Genista anglica</i> and Dyer's greenweed <i>Genista tinctoria</i> within the purple moor-grass pasture; a diverse array of invertebrates such as the green hairstreak <i>Callophrys rubi</i> and the nationally scarce Devon carpet moth <i>Lampropteryx otregiata</i> ; and birds such as skylark <i>Alauda arvensis</i> , bullfinch <i>Pyrrhula pyrrhula</i> , lesser whitethroat <i>Sylvia curruca</i> , reed bunting <i>Emberiza schoeniclus</i> and barn owl <i>Tyto alba</i> .
Jeffreyston Pastures	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest as it has a diverse mix of grassland plants, conditions which are uncommon in Pembrokeshire which has few remaining unimproved neutral grassland fields. The site is horse-grazed and consists of a mixture of marshy grassland with occasional flushes and a drier ridge of neutral grassland in the centre. Notable species include nationally scarce wavy

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				St John's-wort <i>Hypericum undulatum</i> , locally notable dyer's greenweed <i>Genista tinctoria</i> , and the nationally rare butterfly marsh fritillary.
Milford Haven Waterway	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its geology, ancient oak-dominated woodland, a variety of saltmarsh communities, swamps, saline lagoons, rare and scarce plants and invertebrates, nationally important numbers of migratory waterfowl, greater and lesser horseshoe bats and otter. Three saline lagoons are present on the site, which support the nationally scarce tentacled lagoon worm <i>Alkmaria romijni</i> , the crustacean <i>Gammarus chevreuxi</i> and the lagoon cockle <i>Cerastoderma glaucum</i> . The saltmarsh and mudflats present support significant numbers of over-wintering wildfowl and waders, and nationally scarce invertebrate species. Broadleaved woodland, scrub, estuarine and grassland habitats that border the main channel and its various embayments and inlets, provide essential commuting and foraging habitat for bat species. The bat species of interest also have daytime, night-feeding and hibernation roosts in buildings and caves adjacent to and within the site throughout the year. For geological interest features of this SSSI, see Section 3.2 .
Tenby Cliffs and St. Catherine's Island	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for macroalgae and piddocks species present on lower middle shore soft rock and moderately exposed rock at the sub-tidal fringe, intertidal cave and overhang communities and its mixture of intertidal communities. The cliffs also support small areas of maritime cliff and crevice

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				vegetation and scrub. These cliffs also support a variety of nationally scarce plant species. For geological interest features of this SSSI, see Section 3.2.
Waterwynch Bay to Saundersfoot Harbour	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>This site is of special interest for its mixture of intertidal communities, specialised marine habitats (including rockpools, overhangs and cave communities), and mosaic of maritime rock crevice, grassland, heath and coastal scrub communities. Nationally scarce vascular plant species occur across the site including Portland spurge <i>Euphorbia portlandica</i>, ivy broomrape <i>Orobanche hederæ</i>, dotted sedge <i>Carex punctata</i> and royal fern <i>Osmunda regalis</i>. Two pairs of peregrine and small numbers of fulmar regularly nest and breed within the site.</p> <p>For geological interest features of this SSSI, see Section 3.2.</p>
Arfordir Saundersfoot - Telpyn / Saundersfoot - Telpyn Coast	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>This site is of special interest for its intertidal communities and geological exposures. Habitats present include sandy beaches interspersed with bedrock platforms, backed by soft cliffs, shingle and cobbles or artificial structures including sea walls and groynes. The nationally scarce plant species Portland spurge is also present on areas of cliff.</p> <p>For geological interest features of this SSSI, see Section 3.2.</p>
Rhosydd Yerboston / Yerboston Moors	SSSI	Within Terrestrial Ecology and Onshore	Figure 3.1.2	<p>This site is of special interest for its marshy grassland, neutral grassland and presence of the nationally scarce marsh fritillary butterfly. The site comprises a number of wet pastures, scattered across a farmed landscape. These pastures</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Ornithology Study Area		are good examples of the purple moor-grass pasture which were historically more prevalent across southern Pembrokeshire, and still support characteristic insect, plant and bird species associated with the habitat. For geological interest features of this SSSI, see Section 3.2.
Arfordir Marros-Pentywyn / Marros-Pendine Coast	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its geology, broadleaved woodland, maritime cliff and slope communities, grassland-heath mosaic, and intertidal habitats including mussel and piddock beds. The range of habitats on-site support various notable species including the nationally scarce hoverfly <i>Eumerus sabulonum</i> , nesting fulmar, raven and rock pipit and nationally scarce ferns. The limestone bed rock facilitates the presence of ash woodlands which are structurally diverse, hosting well established communities of vegetation in their canopy, understorey and ground flora. For geological interest features of this SSSI, see Section 3.2.
Pont y Fenni Quarry and Road Cutting	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Mylett Road Section	SSSI	Within Terrestrial Ecology and	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Onshore Ornithology Study Area		
Twyni Lacharn - Pentwyn / Laugharne - Pendine Burrows	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its intertidal sand and mud flats, its extensive dune system, dune woodland and wet woodland communities, fens, large standing water body (the Witchett Pool), fen orchid <i>Liparis loeselii</i> , dune gentian <i>Gentianella uliginosa</i> , dune associated invertebrate assemblage, breeding bird assemblage of lowland open water and margins, water vole <i>Arvicola terrestris</i> population and wintering population of the golden plover <i>Pluvialis apricaria</i> . habitats and species that also contribute to the special wildlife interest. The site also comprises areas of scrub, saltmarsh, marshy and semi-improved grassland, ditches and drains - habitats which contribute to the site's overall value and ability to support a wide range of species.
Aber Taf / Taf Estuary	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its saltmarsh habitat, allis shad <i>Alosa alosa</i> and twaite shad <i>Alosa fallax</i> . The sites saltmarsh is associated with extensive areas of intertidal mud, sand and the river channel. The saltmarsh present within the site represents several communities associated with zonation as a result of tidal inundation or grazing pressure. The estuary is valuable to both allis and twaite shad species as they gather there in spring, prior to migrating upstream to spawn in the Afon Tywi and Afon Taf. Otters are also known to be present on site and the wider catchment.

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Whitehill Down	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its species-rich grasslands, marsh grassland and the presence of green-winged orchid <i>Anacamptis morio</i> . Ground conditions and drainage vary across the site as it is sloped, creating a mosaic of different habitat types which host various species of botanical interest.
Afon Tywi	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its geology, saltmarsh, allis shad, twaite shad, otter, little ringed plover <i>Charadrius dubius</i> , sand martin <i>Riparia riparia</i> , club-tailed dragonfly <i>Gomphus vulgatissimus</i> and its community of beetles, flies and other invertebrates inhabiting the river shingle banks. The site is an actively eroding river meandering across a wide flood plain, resulting in extensive shingle banks being formed which are important for birds and invertebrates. Special interest for fish species and otters relate to river itself, with the lower reaches being of interest for saltmarsh vegetation communities. For geological interest features of this SSSI, see Section 3.2 .
Craig Ddu - Wharley Point Cliffs	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its semi-natural woodland, maritime cliff and rock, and coastal grasslands. The location of the site has resulted in species being present that require mild winter conditions, including the frost-tender maidenhair fern <i>Adiantum capillus-veneris</i> , sea spleenwort <i>Asplenium marinum</i> , madder <i>Rubia peregrina</i> , and the centipedes <i>Lithobius pilicornis</i> and <i>Hydroschendyla submarina</i> , and the snail <i>Pomatias elegans</i> . Ornithological

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				interest is also present on the site through a long-established heronry with approximately 20 breeding pairs and regular nesting peregrines.
Creigiau Llansteffan (Llanstephan Cliffs)	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Arfordir Pen-bre / Pembrey Coast	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site's habitats of special interest include the vegetational transitions between saltmarsh, sand dunes, wet woodland, neutral grassland as well as associated scrub and river and open channel habitats. Nationally important numbers of oystercatchers and sanderlings <i>Calidris alba</i> occur as well as an important assemblage of invertebrates, including rare species such as the ground beetle <i>Panagaeus cruxmajor</i> and the weevil <i>Datonychus arquatus</i> . Notable and scarce plant species are present within the site's dune slacks, namely the fen orchid, dune gentian <i>Gentianella uliginosa</i> and the fragrant orchid <i>Gymnadenia conopsea</i> .
Meidrim Road Section	SSSI	Within Terrestrial Ecology and Onshore	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Ornithology Study Area		
Cwm Crymlyn Road Section	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Beacon bog	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest due to it being a lowland raised bog, with approximately 2m of peat at its centre. The surface of the bog is typical of a lowland raised bog, with wet conditions and actively growing <i>Sphagnum</i> spp. Scarce plant species present also include bog rosemary <i>Andromeda polifolia</i> , royal fern, cranberry <i>Vaccinium oxycoccus</i> , petty whin and purple moor-grass <i>Molinia caerulea</i> towards the bog's drier edges.
Dan-Lan-Y-Castell Quarry	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Cors Goch, Llanllwch	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest as it is a lowland raised bog with peat up to 5m deep, the pools of which support the small red damselfly <i>Ceriagrion tenellum</i> and support bog bush cricket <i>Metrioptera brachyptera</i> across the wider site. The surface of the bog has steep-sided pools containing <i>Sphagnum</i> spp. as well as heather <i>Calluna vulgaris</i> , cross-leaved heather <i>Erica tetralix</i> and purple moor-grass at the peat's surface. The edges of the bog include small areas of alder carr and a small fen of common reed <i>Phragmites australis</i> . Other notable plant species present include sundews <i>Drosera</i> spp., lesser bladderwort <i>Utricularia minor</i> and bog rosemary.
	NNR		Figure 3.1.2	
Maesyrior	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Glan Pibwr Stream Section	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Allt Penyrcoed Stream Section	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Coed Gwempa	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its broadleaved semi-natural woodland. Three woodland types are present on the site: pedunculate oak <i>Quercus robur</i> - bracken woodland on the poorer, less base-rich ground which dominates the site; ash - rowan <i>Sorbus aucuparia</i> woodland on higher and less waterlogged areas; and small areas of alder woodland. The woodland types present are structurally diverse, hosting well established communities of vegetation in their canopy, understorey and ground flora.
Coedydd Capel Dyddgen	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest for its ash – hazel <i>Corylus avellana</i> woodland, neutral grassland, cave roosting greater horseshoe bats and hazel scrub supporting hazel dormice <i>Muscardinus avellanarius</i> . The woodland areas are dominated by ash and hazel, often with dense growths of blackthorn <i>Prunus spinosa</i> , hawthorn <i>Crataegus monogyna</i> and holly <i>Ilex aquifolium</i> at the woodland edges. Ground flora communities are also well established within the woodlands. The neutral grassland on site is the only known example of slightly calcicolous neutral grassland in Carmarthenshire. Calcicolous species such as marjoram <i>Origanum vulgare</i> , thyme <i>Thymus vulgaris</i> , and fairy flax

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<p><i>Linum catharticum</i> have colonised areas affected by previous quarrying. Several noteworthy invertebrates occur including the minute woodlouse <i>Metatrichoniscoides celticus</i>, the harvestman <i>Sabacon viscayanum</i>, ancient woodland snails <i>Acicula fusca</i> and <i>Ena montana</i>, and the calcareous grassland snail <i>Helicella itala</i>.</p>
Mynydd Llangydeyrn	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>This site is of special interest for its marshy grassland, wet heath and dry heath. The site comprises a mosaic of semi-natural grassland, dry heath, mire and rock outcrops, and is notable as one of the larger upland semi-natural areas left in south-west Wales. Ornithological interest includes breeding curlew, stonechat and grasshopper warbler <i>Locustella naevia</i>. Grassland areas host notable invertebrate communities, including the snail <i>Helicella itala</i>, the woodlouse <i>Armadillidium pulchellum</i> and the local ant, <i>Myrmica lobicornis</i>.</p>
Smarts quarry	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	<p>This SSSI is designated purely for geological interest features as described in Section 3.2.</p>
Cwm Clydach, Cydweli	SSSI	Within Terrestrial Ecology and Onshore	Figure 3.1.2	<p>This site is of special interest due to the presence of the lichen <i>Sticta sylvatica</i> and the hay-scented buckler fern <i>Dryopteris aemula</i>. The site comprises a deep ravine with more acidic conditions on the upper (northern) part of the gorge, dominated by oak <i>Quercus</i> spp. and ash on its lower slopes. Oak-</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Ornithology Study Area		dominated areas are characterised by a ground cover of bilberry <i>Vaccinium myrtillus</i> , wavy-hair grass <i>Deschampsia flexuosa</i> , greater wood rush <i>Luzula sylvatica</i> and broad buckler fern <i>Dryopteris dilatata</i> . The lower ash slopes comprise ground flora species including abundant wood anemone <i>Anemone nemorosa</i> , woodruff <i>Galium odoratum</i> , early dog violet <i>Viola reichenbachiana</i> , early purple orchid <i>Orchis mascula</i> and soft shield fern <i>Polystichum setiferum</i> . The site also supports a well-developed lower plant flora on shaded outcrops.
Gwel y Coed	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest due to the presence of Killarney fern <i>Trichomanes speciosum</i> , an internationally rare species. The site comprises a wooded stream valley with several short ravines, with ash and sycamore <i>Acer pseudoplatanus</i> abundant within the semi-natural woodland and hazel frequent in the shrub layer.
Gwernydd Penbre	SSSI	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is of special interest due to the presence of large reedbeds, marshy grasslands, willow carr, Cetti's warbler <i>Cettia cetti</i> and the sites invertebrate community. The reedbeds on site host variety of specialist birds and insects such as the reed warbler <i>Acrocephalus scirpaceus</i> and bittern <i>Botaurus stellaris</i> and several wainscots <i>Mythimna</i> spp. moths.
Burry Inlet and Loughor Estuary	SSSI	Within Terrestrial Ecology and Onshore	Figure 3.1.2	This site is of special interest due to its geomorphology, saltmarsh, brackish swamps, reedbeds and grasslands, important numbers of wildfowl and waders, and intertidal features. The extensive saltmarshes have varied geomorphological zones that illustrate key stages of marsh development and

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
		Ornithology Study Area		sediment dynamics. Its diverse vegetation ranges from pioneer species like <i>Salicornia</i> spp. to extensive mid and upper marsh communities of <i>Puccinellia</i> spp. and <i>Festuca</i> spp., as well as brackish swamps and reedbeds further inland. The inlet supports internationally and nationally significant bird populations, including high numbers of oystercatcher, wigeon, knot, pintail, golden plover and teal, along with important passage species such as terns and whimbrel.
Pembrey Burrows and Saltings	LNR	Within Terrestrial Ecology and Onshore Ornithology Study Area	Figure 3.1.2	This site is a large dune and saltmarsh system. The site has several stages of sand dune present including embryo dunes, semi-stable yellow dunes and mature grey dunes that form species-rich dune grassland. The site is renowned for its exceptional plant diversity, supporting rarities such as dune pansy <i>Viola tricolor subsp. curtisii</i> , sand catchfly <i>Silene conica</i> , bloody cranesbill <i>Geranium sanguineum</i> , fragrant evening primrose <i>Oenothera stricta</i> and kidney vetch <i>Anthyllis vulneraria</i> . Invertebrate interest species include the small blue and marbled white butterflies <i>Melanargia galathea</i> and numerous solitary bees and wasps.
Whiteford	NNR	0.14km east	Figure 3.1.2	This site has an extensive dune system as well as saltmarsh habitats which support large populations of wintering wildfowl and waders. Notable plant species include early marsh orchid <i>Dactylorhiza incarnata</i> , fen orchid and dune gentian.

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Afon Cleddau Dwyreiniol / Eastern Cleddau River	SSSI	0.15km west	Figure 3.1.2	This site is of special interest primarily for supporting important populations of otter, bullhead, river lamprey and brook lamprey. The Eastern Cleddau is a predominantly lowland river flowing through a varied landscape of marshy grassland, heath, woodland, fen and bog. Its moderately nutrient-rich lower sections support diverse aquatic and marginal plant communities, including notable mosses, liverworts and locally rare species. Its tributaries such as the Afon Wern, Llanycefn, Rhyd-afallen and the Afon Syfynwy contribute to the mosaic of habitats present including shaded gorges, gravel-bed channels and reservoirs hosting specialist aquatic flora. The river system supports rich riparian habitats of wet woodland, scrub and marshy grassland and is an important refuge for migratory fish species. The Eastern Cleddau is also one of Britain’s most significant otter rivers, offering abundant food and secure breeding sites. The site also supports a range of breeding birds and is an important foraging corridor for greater and lesser horseshoe bat populations.
Carew Castle	SSSI	0.16km north	Figure 3.1.2	This site is of special interest for the presence of greater horseshoe bats and the wider assemblage of other bat species. The castle and its surrounding habitats at the head of the Carew River estuary form an important seasonal roosting, feeding and transitional site for greater horseshoe bats, with up to 30–33 individuals regularly using the Castle in spring and many more passing through annually from nearby breeding roosts and hibernacula. The Castle’s extensive crevices, chimneys and underground structures provide ideal sheltered roosting spaces, while adjacent grassland, millpond and sheltered lanes offer rich insect-feeding habitat. Lesser horseshoe bats and several other

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<p>species (including common pipistrelle <i>Pipistrellus pipistrellus</i>, brown long-eared, Natterer's, Daubenton's, Brandt's <i>Myotis brandti</i> and whiskered bats <i>M. mystacinus</i>) also use the site for roosting and foraging. The limestone-rich walls and surrounding calcareous grassland support nationally rare and scarce plants such as compact brome <i>Bromus madritensis</i>, southern polypody <i>Polypodium cambricum</i> and lax-flowered sea-lavender <i>Limonium humile</i>. The site additionally supports birds including breeding barn, tawny <i>Strix aluco</i> and little owls <i>Athene noctua</i>, peregrine, and wintering waders such as dunlin, redshank and sandpipers <i>Actitis hypoleucos</i>.</p>
Ynys Uchaf	SSSI	0.36km east	Figure 3.1.2	<p>This site is of special interest for fen and semi-natural broadleaved woodland habitats. The site comprises a large floodplain mire, characterised by extensive fen vegetation and notable as the Borough's only site for tubular water-dropwort <i>Oenanthe croccata</i>. Small acidic patches of the site support species such as bladder-sedge <i>Carex vesicaria</i> and bogbean <i>Menyanthes trifoliata</i>. The southern margin of the site comprises alder, ash and willow carr. The site provides breeding habitat for water rail <i>Rallus aquaticus</i> and is frequented by teal, mallard <i>Anas platyrhynchos</i> and otters that use the dense vegetation for cover. Several notable invertebrates occur at the site, including the iridescent beetle <i>Pilemostoma fastuosa</i>, the beetle <i>Phyllobrotica quadrimaculata</i>, and the slender groundhopper <i>Tetrix subulata</i>.</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Gweunydd a Choed Pen-Ty (Pen-Ty Pastures & Wood)	SSSI	0.82km east	Figure 3.1.2	<p>This site is of special interest for its marshy grassland. The site is made up of two herb-rich unimproved grasslands linked by wet semi-natural woodland, creating a highly diverse habitat that supports many uncommon plants and invertebrates. The southern pasture is notable for its exceptionally large population of meadow thistle and other characteristic damp-pasture species. The northern pasture is a mesotrophic grassland rich in bird's-foot-trefoil <i>Lotus corniculatus</i>, knapweed <i>Centaurea nigra</i> and fine grasses. The northern pasture is especially important for invertebrates, with twenty-four butterfly species recorded, including marbled white, small blue, silver-washed fritillary <i>Argynnis paphia</i>, brown hairstreak <i>Thecla betulae</i>. The southern pasture also has invertebrate interest, with marsh fritillary, small pearl-bordered fritillary <i>Boloria selene</i> and the hoverfly <i>Arctophila fulva</i>. The connecting wet woodland, dominated by alder and ash provides valuable shelter and habitat continuity across the site.</p>
St. Margaret's Island	SSSI	0.86km south	Figure 3.1.2	<p>This site is of special interest for the presence of the largest cormorant <i>Phalacrocorax carbo</i> colony in Wales and amongst the largest in Britain, making up approximately 3% of the British population. The site is covered in maritime grassland, hosting notable coastal plants such as tree-mallow <i>Lavatera arborea</i>, golden-samphire <i>Inula crithmoides</i> and rock samphire <i>Crithmum maritimum</i>. The island's cliffs and stacks host a diverse seabird assemblage, and 1985 counts recorded 238 cormorant pairs alongside</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				substantial numbers of kittiwake <i>Rissa tridactyla</i> , razorbill, guillemot, various gulls and puffins.
Waun-fawr	SSSI	1.11km east	Figure 3.1.2	This site is of special interest for its marshy grassland. The site is a diverse example of the sedge-rich heathy grasslands characteristic of the Carmarthen Coalfield, occupying a peat-lined basin dominated in parts by purple moor-grass and rushes. Acidic flushes host specialist species including butterwort <i>Pinguicula vulgaris</i> , round-leaved sundew <i>Drosera rotundifolia</i> , spike-rush <i>Eleocharis multicaulis</i> , bog pimpernel <i>Anagallis tenella</i> , heather, cross-leaved heath and common cottongrass <i>Eriophorum angustifolium</i> . The site also has strong populations of notable invertebrates, including marbled white, marsh fritillary, and the scarlet tiger moth <i>Callimorpha dominula</i> .
Bishops Pond	SSSI	1.37km north	Figure 3.1.2	This site is of special interest for its open water and swamp areas. In summer, dense sweet-grass <i>Glyceria maxima</i> , bladder-sedge <i>Carex vesicaria</i> and bur-reed <i>Sparganium erectum</i> surround open pools dominated by yellow water-lily <i>Nuphar lutea</i> . The low summer water table create open edges with species such as water-pepper <i>Polygonum hydropiper</i> , northern yellow-cress <i>Rorippa islandica</i> and trifid bur-marigold <i>Bidens tripartita</i> . The lake is bordered by woodland and hedgerow trees, and in winter a large temporary island forms at its western end. The site also supports breeding birds such as mute swan <i>Cygnus olors</i> , mallard, and kingfisher <i>Alcedo atthis</i> , along with a range of coarse fish species, reflecting its history as a traditional stocked fishery.

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Twyni Chwitffordd, Morfa Landimor a Bae Brychdwn / Whiteford Burrows, Landimore Marsh and Broughton Bay	SSSI	1.41km south	Figure 3.1.2	<p>This site is of special interest for its geology and coastal habitats including mud and sandflats, grazed saltmarsh, calcareous dunes and dune slacks. The site supports diverse assemblages of flowering plants, fungi and invertebrates associated with the dune system, including the narrow-mouthed whorl snail <i>Vertigo angustior</i> and a nationally scarce polychaete worm <i>Ophelia bicornis</i>. The site contributes to the internationally important overwintering bird populations of the Burry Inlet.</p> <p>For geological interest features of this SSSI, see Section 3.2.</p>
Ashpits Pond – Pwll	LNR	2.21km east	Figure 3.1.2	<p>The site is an important site for breeding wetland birds, with the surrounding reedbeds offering valuable cover for nesting as well as safe resting places. A range of waterbirds, including mute swan, mallard, tufted duck <i>Aythya fuligula</i>, little grebe <i>Tachybaptus ruficollis</i>, great crested grebe <i>Podiceps cristatus</i>, coot <i>Fulica atra</i> and moorhen <i>Gallinula chloropus</i>, all nest around the pond. The reedbeds also support breeding populations of reed warbler, sedge warbler <i>Acrocephalus schoenobaenus</i> and reed bunting, while the rare Cetti's warbler is found in the nearby willow carr. During winter, species such as water rail and pochard <i>Aythya ferina</i> make regular use of the site.</p>
Coedydd y Garn	SSSI	2.22km east	Figure 3.1.2	<p>This site is of special interest for its semi-natural broadleaved woodland, acidic grassland and neutral grassland. The site is an example of ash and oak dominated woodland on the Carboniferous Limestone surrounding the South Wales Coalfield. The ground flora is diverse, with species such as wood</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<p>anemone, early dog-violet, lesser celandine <i>Ranunculus ficaria</i> and early purple orchid. Exposed outcrops host dry-loving herbs and a characteristic assemblage of calcicolous molluscs, while north-facing slopes contain alder and oak filled flushes that vary from calcareous to acidic. The site's abundant dead wood and sunny woodland edges support a rich invertebrate fauna, including the uncommon bee chafer <i>Trichius fasciatus</i>, glow worm <i>Lampyrus noctiluca</i>, brown and yellow robber-fly <i>Asilus crabroniformis</i>. The woods also host a variety of breeding birds, including pied flycatcher <i>Ficedula hypoleuca</i> and redstart <i>Phoenicurus phoenicurus</i>.</p>
Pembroke Mill Ponds	LNR	2.39km west	Figure 3.1.2	<p>This site contains a mix of estuarine and freshwater habitats including open water, reedbeds, fen and wet woodland. This variety of habitats attracts a diverse bird community, including waterbirds like little grebe, mute swan, mallard, teal, and kingfisher, along with woodland species. The site also supports a wide range of aquatic invertebrates. Three-spined stickleback <i>Gasterosteus aculeatus</i>, European eel and brown/ sea trout occur on the site. Otters also regularly use the ponds and reedbeds.</p>
Llanfallteg Track Section	SSSI	2.64km north	Figure 3.1.2	<p>This SSSI is designated purely for geological interest features as described in Section 3.2.</p>
Stackpole	NNR	2.81km southwest	Figure 3.1.2	<p>This site comprises a diverse landscape includes the shallow freshwater Bosherton lakes, woodlands, dunes, limestone cliffs and beaches. The site is a stronghold for greater horseshoes bats. The lakes support otters, water birds</p>

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				and dragonflies. The limestone cliffs, dunes and maritime grassland support several notable plant and animal species, including diminutive soil and rock lichens, flowering plants, scarce insects and breeding populations of chough and colonial seabirds.
Pwll lagoon	SSSI	2.93km east	Figure 3.1.2	This site is notable for the presence of swamps and fen woodland. The site is a former pulverised fuel ash (PFA) settling lagoon which has resulted in unique conditions created by weathered pulverised fuel ash. The alkaline, nutrient-poor PFA has developed into calcareous silt with a hard pan beneath, enabling rare combinations of fen vegetation, sedge-rich communities, open calcareous patches and acid-tolerant species to coexist. The eastern third is an open wet fen dominated by common reed. Areas of bare silt support notable invertebrates including the scarce blue-tailed damselfly <i>Ischnura pumilio</i> , keeled skimmer <i>Orthetrum coerulescens</i> and the soldier-flies <i>Stratiomys potamida</i> and <i>Odontomyia viridula</i> . The western two-thirds form hummocky birch <i>Betula</i> spp.-willow <i>Salix</i> spp. woodland with acidophile species such as royal fern and bog mosses. The lagoon also supports reed buntings, sedge warblers, and wintering snipe <i>Gallinago gallinago</i> .
Robeston Wathen Quarries	SSSI	3.29km northwest	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
Cwm yr Abbey Stream Section	SSSI	3.82km northeast	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Minwear Wood	SSSI	3.92km northwest	Figure 3.1.2	This site is of special interest for its ancient semi-natural broadleaved woodland. The site is dominated by sessile oak <i>Quercus petraea</i> with holly, rowan and hazel understoreys. The woodland also includes areas of birch, willow and alder in younger coppiced sections, with ash and non-native beech on the estuary slopes. Its ground flora is diverse, with around 120 higher plant species recorded, including the scarce hay-scented buckler-fern and wood spurge <i>Euphorbia amygdaloides</i> . The site also supports around 70 species of epiphytic lichens and 85 mosses and liverworts. The combination of abundant deadwood and varied microhabitats also supports a wide range of woodland birds.
Wernbongam Stream Section and Quarry	SSSI	4.54km northeast	Figure 3.1.2	This SSSI is designated purely for geological interest features as described in Section 3.2.
Waun Las	NNR	4.49km northeast	Figure 3.1.2	The site is a large area of countryside, managed as an organic farm to encourage biodiversity, comprising a mosaic of lakes, streams, marsh, semi-natural woodland, meadows and formal gardens. The site supports many invertebrate species, including over 600 types of butterflies and moth, 70 species of bees and 80 species of hoverflies. Over 500 native plant species are also present on site. Herpetofaunal interest species present include common

Gwynt Glas Offshore Wind Farm Scoping Report

SITE NAME	DESIGNATION	DISTANCE FROM TERRESTRIAL ECOLOGY AND ONSHORE ORNITHOLOGY STUDY AREA	FIGURE REFERENCE	QUALIFYING FEATURE(S)/ REASON FOR NOTIFICATION
				<p>frogs <i>Rana temporaria</i>, common toads <i>Bufo bufo</i> and palmate newts <i>Lissotriton helveticus</i>, common lizards <i>Zootoca viviparus</i>, grass snakes <i>Natrix helvetica</i> and slow worms <i>Anguis fragilis</i>. Notable mammals present hazel dormice, otters and bats.</p>