

ABWP Phase I Decommissioning

Summary of Mitigation, Residual Effects and Monitoring

Volume 2, Chapter 11



Project name ABWP Phase I Decommissioning

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Statement of Authority

Author	Qualifications	Relevant Experience
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Matt Royall	BSc (Hons) Natural Environmental Science (Earth Sciences), University of Sheffield (UK) MSc Environmental Pollution Control, University of Leeds (UK) Chartered Environmentalist (CEnv)	Over 25 years' experience of environmental impact assessment for a wide range of sectors, including windfarms. Experience is across a number of geographies including Ireland, UK, Poland, Lithuania and Romania.
Kim Bridge	Master of Oceanography (MOcean), University of Southampton (UK)	Over 13 years' experience in permitting, consenting and environmental assessment for a wide range of coastal and marine projects including offshore wind farms, subsea cables, ports and harbours and coastal development in geographies of UK and Ireland.

Glossary

Term	Meaning
Arklow Bank Wind Park (ABWP) Phase I	Arklow Bank Wind Park (ABWP) Phase I comprises: - Offshore infrastructure seaward of High Water Mark (HWM), including: - Seven Wind Turbine Generators (WTG) with a combined capacity of 25.2 MW; - One meteorological (met) mast; - Inter-array cables connecting the WTGs and met mast; and - One offshore export cable connecting WTG T4 with landfall at HWM; - Onshore infrastructure landward of HWM including:

Term	Meaning
	– One onshore cable connecting landfall at HWM with the onshore substation; and – One onshore substation compound, where the onshore substation and ancillary infrastructure are located.
Additional mitigation	Actions that will be required to reduce the significance of environmental effects of the Proposed Works, which will be dependent on the significance of effects assessed in the EIAR. Also referred to as secondary mitigation in Institute of Environmental Management and Assessment (IEMA) (2024). IEMA is now the Institute of Sustainability and Environmental Professionals (ISEP).
Arklow Energy	Arklow Energy Limited, the entity seeking planning permission for the Proposed Works, i.e. the applicant.
Decommissioning	The final closing down and putting into a state of safety of a development, project or process when it has come to the end of its useful life (EPA, 2022).
Detailed Lighting and Marking Plan (LMP)	The contractor-developed version of the Outline LMP (see Volume 3, Appendix 3.7), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Offshore Decommissioning Environmental Management Plan (DEMP)	The contractor-developed version of the Outline Offshore DEMP (see Volume 3, Appendix 3.4), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Offshore Waste Management Plan (WMP)	The contractor-developed version of the Outline Offshore WMP (see Volume 3, Appendix 3.8), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Detailed Vessel Management Plan (VMP)	The contractor-developed version of the Outline VMP (see Volume 3, Appendix 3.5), to be prepared before Proposed Works Offshore commence and maintained as a live document until completion.
Dredged material	Seabed material arising from localised dredging potentially required to facilitate safe vessel access during Proposed Works Offshore, and / or extraction of seabed material located inside monopile (MP) foundations, as part of MP decommissioning.
Effect	The consequence of an impact on a receptor. For example, in the offshore environment, vessel activity (activity) results in increased levels of underwater noise (impact), with the potential to disturb marine mammals (effect).
Embedded mitigation	Mitigation measures included as part of the Proposed Works. Include modifications arising through the iterative design process; and standard industry practice that would occur even without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. Correspond to primary and tertiary mitigation defined in Institute of Environmental Management and Assessment (IEMA) (now Institute of Sustainability and Environmental Professionals (ISEP)) (2024).
Environmental Impact Assessment (EIA)	Process of assessment of the effects of a project or development proposal on the environment. In the planning area, it is undertaken by a planning authority or An Coimisiún Pleanála during the consideration of applications for planning permission, taking account of an Environmental Impact Assessment Report (EIAR). The projects which require EIA are listed in Annex I and Annex II of the EIA Directive, as amended (Office of the Planning Regulator, n.d.).
Environmental Impact Assessment Report (EIAR)	A report or statement of the effects, if any, that Proposed Works, if carried out, would have on the environment. It is prepared by the developer to inform the EIA process (Office of the Planning Regulator, n.d.).

Term	Meaning
High Water Mark (HWM)	Level reached by the sea at high tide, measured as the mean of high tides.
Impact	A change brought about by the Proposed Works.
Inter-array cables	Subsea power lines that link individual wind turbine generators (WTGs) together in an offshore wind farm, forming an electrical network. In ABWP Phase I, inter-array cables connect WTGs and the met mast to each other and have an overall length of 7.4 km.
Landfall	The point where the offshore export cable transitions from the offshore marine environment to the onshore terrestrial environment.
Meteorological (Met) mast	A mast with a number of meteorological sensors located at different heights to record meteorological and sea condition data
Mitigation measures	Measures to avoid, prevent or reduce impacts (EPA, 2022), which comprise both embedded and additional mitigation, see separate definitions for these.
Monitoring	The periodic or continuous observation of biodiversity indicators and of other parameters that may affect biodiversity for any changes that may occur over time, so as to confirm predictions made with respect to likely effects and identify adverse changes that may require remedial action (Office of the Planning Regulator, n.d.).
Monopile (MP)	Hollow steel cylinder driven into the seabed typically used to anchor an offshore wind turbine generator (WTG). In ABWP Phase I, MPs support the seven WTGs as well as the meteorological (met) mast.
Offshore export cable	Subsea power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the offshore export cable connects the wind turbine generator (WTG) T4 to landfall with an approximate overall length of 15.6 km. At landfall, the offshore export cable transitions to the onshore cable connecting to the onshore substation.
Offshore Site	Part of the Site where Proposed Works Offshore are proposed to take place. In this application for planning permission, the Offshore Site comprises the Sub Lease Area, where the ABWP Phase I wind turbine generators (WTGs), met mast and inter-array cables are located, and the offshore export cable 10 m corridor connecting WTG T4 to the landfall at high water mark (HWM) near Arklow Harbour.
Onshore cable	Land-based portion of the power cable that transports the total generated power from an offshore wind farm to the onshore power grid. In ABWP Phase I, the onshore cable connects the landfall point at HWM to the onshore substation building.
Onshore Site	Part of the site where Proposed Works Onshore are proposed to take place. In this application for planning permission, the Onshore Site comprises the onshore substation compound that hosts the onshore substation building and ancillary facilities; the onshore cable 10 m corridor connecting the landfall point from high water mark (HWM) to the onshore substation, and the area that will temporarily be used for temporary storage of plant, vehicles, machinery, excavated soil and materials.
Onshore substation compound	Fenced compound that hosts the onshore substation building and ancillary facilities, including the 38 kV transformer.
Pathway	The route by which an effect is conveyed between a source and a receptor (EPA, 2022).
Proposed Works	The Proposed Works include decommissioning of ABWP Phase I offshore infrastructure (Proposed Works Offshore) and decommissioning of ABWP Phase I onshore infrastructure (Proposed Works Onshore).
Receptor	Any element in the environment which is subject to impacts (EPA, 2022).

Term	Meaning
Residual effect	The final predicted effect / impact remaining after mitigation (EPA, 2022).
Scour protection	Engineered barrier typically placed on the seabed around WTG foundations and subsea cables to prevent sediment erosion caused by accelerated water currents and waves, safeguarding the WTG's stability and protecting subsea cables. In ABWP Phase I, scour protection was originally introduced in the form of rock armour, however, this proved ineffective, and was removed in 2005. Since then, scour protection has been introduced through sandbags.
Significance	The importance of the outcome of the impact (or the consequence of change) for the receiving environment (EPA, 2022).
Sub Lease Area	Area where the ABWP Phase I WTGs, met mast and inter-array cables are located, as defined in the Sub Lease granted by Sure Partners Limited (SPL) to Arklow Energy Limited (Arklow Energy) to construct and operate ABWP Phase I.
Wind Turbine Generator (WTG)	Structure that converts the kinetic energy of ocean winds into electrical energy. ABWP Phase I includes seven GE Energy 3.6s WTGs with a rated capacity of 3.6 megawatts (MW) per WTG.

Acronyms

Acronym	Meaning
ABWP	Arklow Bank Wind Park
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
FMMS	Fisheries Management and Mitigation Strategy
HWM	High Water Mark
INNS	Invasive Non-Native Species
LMP	Lighting and Marking Plan
MMMP	Marine Mammal Mitigation Protocol
MP	Monopile
MSO	Marine Survey Office
SSC	Suspended Sediment Concentrations
UKHO	United Kingdom Hydrographic Office
VMP	Vessel Management Plan
WFD	Water Framework Directive
WMP	Waste Management Plan
WTG	Wind Turbine Generator

Units

Unit	Meaning
km	Kilometres
kV	Kilovolts

Unit	Meaning
m	metre
MW	Megawatts
nm	Nautical mile

11 SUMMARY OF MITIGATION, RESIDUAL EFFECTS AND MONITORING

11.1 Introduction

- 11.1.1.1 Arklow Energy Limited (Arklow Energy) is seeking planning permission to decommission Arklow Bank Wind Park (ABWP) Phase I (referred to hereafter as 'the Proposed Works'). The Proposed Works include decommissioning of ABWP Phase I offshore infrastructure (Proposed Works Offshore) and decommissioning of ABWP Phase I onshore infrastructure (Proposed Works Onshore).
- 11.1.1.2 The Proposed Works Offshore will be undertaken within the Offshore Site (see **Volume 2, Chapter 3: Proposed Works Description**), which includes:
- The Sub Lease Area, located on the long narrow Arklow Bank sand bank, situated approximately 10 km off the coast of Arklow, south-east Ireland, where seven wind turbine generators (WTGs) and foundations, associated scour protection, 7.4 km of inter-array cables and one met mast are located; and
 - A 10 m wide cable corridor along the 15.6 km offshore export cable route connecting WTG T4 to the landfall point at High Water Mark (HWM).
- 11.1.1.3 The Proposed Works Onshore will be undertaken within the Onshore Site (see **Volume 2, Chapter 3**), located landward of the HWM in Ferrybank, off North Quay road, within Arklow Harbour, and comprises:
- A fenced compound that hosts the onshore substation building and ancillary facilities; and
 - A 10 m wide cable corridor along the onshore cable connecting the landfall point from HWM to the onshore substation.
- 11.1.1.4 This chapter of the Environmental Impact Assessment Report (EIAR) presents a summary of mitigation, residual effects and monitoring detailed within the EIAR topic-specific chapters,
- 11.1.1.5 Given that the EIA Scoping Presentation (see **Volume 3, Appendix 1.1**) and **Volume 2, Chapter 1: Introduction** did not identify credible pathways to significant effects on onshore environmental factors or in relation to the Proposed Works Onshore, these are not considered further in this chapter.
- 11.1.1.6 This chapter has been informed by:
- **Volume 2, Chapter 4: Coastal Processes, Water and Sediment Quality;**
 - **Volume 2, Chapter 5: Marine Biodiversity;**
 - **Volume 2, Chapter 6: Commercial Fisheries and Aquaculture;**
 - **Volume 2, Chapter 7: Shipping and Navigation;**
 - **Volume 2, Chapter 8: Marine Archaeology;**
 - **Volume 2, Chapter 9: Summary of Interaction of Effects;** and
 - **Volume 2, Chapter 10: Summary of Cumulative Effects.**

11.2 Summary of Mitigation, Residual Effects and Monitoring

- 11.2.1.1 **Table 11.1** provides a consolidated summary of the mitigation, residual effects and monitoring associated with the Proposed Works Offshore, further detailed in **Volume 2, Chapters 4 – 8**.
- 11.2.1.2 As explained in **Volume 2, Chapter 1**, mitigation measures are those adopted to avoid, prevent or reduce impacts (EPA, 2022), which comprise both:
- Embedded mitigation measures, included as part of the Proposed Works. These include modifications arising through the iterative design process; and standard industry practice that would occur without input from the EIA process, e.g. actions undertaken to meet other existing legislative requirements, or actions that are standard practices used to manage commonly occurring environmental effects. Correspond to primary and tertiary mitigation defined in Institute of Environmental Management and Assessment (IEMA) (now Institute of Sustainability and Environmental Professionals (ISEP)) (2024); and
 - Additional mitigation, actions that will be required to reduce the significance of environmental effects of the Proposed Works, which will be dependent on the significance of effects assessed in the EIAR. Also referred to as secondary mitigation in IEMA, 2024.
- 11.2.1.3 As indicated in **Volume 2, Chapters 4 – 8** and summarised in **Volume 2, Chapter 9**, potential interaction of effects, including effects that may extend beyond the completion of the Proposed Works Offshore, and effects that may interact spatially and temporally to result in inter-related effects upon a single receptors, are unlikely to increase the significance of effects as assessed when considering the Proposed Works Offshore alone.
- 11.2.1.4 As indicated in **Volume 2, Chapters 4 – 8** and summarised in **Volume 2, Chapter 10**, potential cumulative effects, considering the Proposed Works Offshore together with other developments of relevance, are unlikely to increase the significance of effects as assessed when considering the Proposed Works Offshore alone.

Table 11.1: Summary of Mitigation, Residual Effects and Monitoring associated with Proposed Works Offshore

Potential impact	Embedded mitigation	Additional mitigation	Residual effect	Monitoring
Coastal Processes, Water and Sediment Quality (Volume 2, Chapter 4)				
Impact to water quality from increased suspended sediment concentrations (SSC)	• MPs will be cut below the seabed at a depth that will minimise post-decommissioning residual MP exposure risks. • If dredging for vessel access is required, disposal of dredged material will only be undertaken within the Sub Lease Area updrift from the dredge location. • If dredging is required, pre-dredging surveys will be	No	Minor Adverse (not significant in EIA terms)	No additional monitoring beyond post-decommissioning monitoring envisaged to form part of Proposed Works Offshore, see 'embedded mitigation' column.
Impact to water quality from disturbance/remobilisation of sediment bound contaminants		No	• Negligible or Minor Adverse (water quality in the wider marine area) • Minor Adverse (water quality in Water Framework Directive)	

Potential impact	Embedded mitigation	Additional mitigation	Residual effect	Monitoring
	undertaken to refine and minimise dredging/disposal areas, where possible.		(WFD) designated waterbodies) • Neutral (water quality in designated bathing waters) (not significant in EIA terms)	
Impacts to the Arklow Bank morphology and the coastline due to changes in seabed morphology	• Development and adherence to the Detailed Offshore Decommissioning Environmental Management Plan (DEMP) (see outline version in Volume 3, Appendix 3.4).	No	Minor Adverse (not significant in EIA terms)	
Post decommissioning monopile (MP) exposure causing scour impacts on the Arklow Bank	• Development and adherence to the Detailed Vessel Management Plan (VMP) (see outline version in Volume 3, Appendix 3.5). • Development and adherence to the Detailed Waste Management Plan (WMP) (see outline version in Volume 3, Appendix 3.8). • Post-decommissioning monitoring will be undertaken to verify resulting seabed condition and inform the Close Out Report. If monitoring confirms any observed residual MP exposure, then the relevant authorities will be informed.	No	Negligible or Minor Adverse (not significant in EIA terms)	
Marine Biodiversity (Volume 2, Chapter 5)				
Temporary habitat loss/disturbance	• Development and adherence to the Detailed Offshore DEMP (see outline version in Volume 3, Appendix 3.4).	No	Minor Adverse (not significant in EIA terms)	No
Increased SSC and deposition	• Development and adherence to the Detailed VMP (see outline version in Volume 3, Appendix 3.5).	No	Minor Adverse (not significant in EIA terms)	No
Disturbance/remobilisation of sediment bound contaminants	• Development and adherence to the Detailed Offshore WMP (see outline version in Volume 3, Appendix 3.8).	No	Negligible (not significant in EIA terms)	No
Alteration of seabed habitat from changes in physical processes		No	Negligible (not significant in EIA terms)	No

Potential impact	Embedded mitigation	Additional mitigation	Residual effect	Monitoring
Removal of hard offshore infrastructure		No	Minor Adverse (not significant in EIA terms)	No
Injury and/or disturbance from underwater noise		Implementation of Marine Mammal Mitigation Protocol (MMMP) (see Volume 3, Appendix 5.3)	Minor Adverse (not significant in EIA terms)	No
Injury and/or disturbance from vessels activity		No	Minor Adverse (not significant in EIA terms)	No
Increased risk of Invasive Non-Native Species (INNS) introduction / spread		No	Minor Adverse (not significant in EIA terms)	No
Changes in the fish and shellfish community affecting prey resources		No	Negligible (not significant in EIA terms)	No
Disturbance and/or displacement of birds		No	Minor Adverse (not significant in EIA terms)	No
Commercial Fisheries and Aquaculture (Volume 2, Chapter 6)				
Loss of fishing grounds or restricted access to fishing grounds in the Sub Lease Area	- Development and adherence to the Detailed Offshore DEMP (see outline version in Volume 3, Appendix 3.4). - Development and adherence to the Detailed VMP (see outline version in Volume 3, Appendix 3.5). - Development and adherence to the Detailed Fisheries Management and Mitigation Strategy (FMMS) (see Volume 3, Appendix 3.6). - Development and adherence to the Detailed Lighting and Marking Plan (LMP) (see Volume 3, Appendix 3.7).	No	- Minor Adverse (Potting fishery) - Negligible (Mussel seed fishery and all other fisheries) (not significant in EIA terms)	No
Loss of fishing grounds or restricted access to fishing grounds in the Offshore Export Cable Route		(Potting fishery) Implementation of FMMS including fisheries liaison, activity planning and Cooperation Agreements to minimise disruption and offset economic effects	- Minor Adverse (Potting fishery and Mussel seed fishery) - Negligible (all other fisheries) (not significant in EIA terms)	No
Displacement of fishing activity into other areas		No	- Minor Adverse (Potting fishery) - Negligible (Mussel seed fishery and all other fisheries) (not significant in EIA terms)	No

Potential impact	Embedded mitigation	Additional mitigation	Residual effect	Monitoring
Interference with fishing activity	Development and adherence to the Detailed Offshore WMP (see outline version in Volume 3, Appendix 3.8).	No	Minor Adverse (not significant in EIA terms)	No
Increased fishing gear snagging risk		No	Minor Adverse (not significant in EIA terms)	No
Effects on commercially exploited species		No	- Minor Adverse (Potting fishery and Mussel seed fishery) - Negligible (all other fisheries) (not significant in EIA terms)	No
Shipping and Navigation (same mitigation, residual effects and monitoring apply under the Most Likely and Worst-Case Scenarios) (Volume 2, Chapter 7)				
Increased collision (vessel-to-vessel) risk – vessel-to-vessel collision in transit	- Development and adherence to the Detailed Offshore DEMP (see outline version in Volume 3, Appendix 3.4). - Development and adherence to the Detailed VMP (see outline version in Volume 3, Appendix 3.5). - Development and adherence to the Detailed LMP (see outline version in Volume 3, Appendix 3.7), which requires charting of residual MPs left <i>in situ</i> under the seabed in conjunction with Marine Survey Office (MSO) / United Kingdom Hydrographic Office (UKHO).	No	Broadly Acceptable (not significant in EIA terms)	No
Increased collision (vessel-to-vessel) risk – powered / drifting collision with decommissioning vessels (not applicable in transitioning and post-decommissioning phases)		No	Broadly Acceptable (not significant in EIA terms)	No
Increased allision (vessel-to-structure) risk – powered vessel-to-structure allision		No	Broadly Acceptable (not significant in EIA terms)	No
Increased allision (vessel-to-structure) risk – drifting vessel-to-structure allision		No	Broadly Acceptable (not significant in EIA terms)	No
Marine Archaeology (Volume 2, Chapter 8)				
Sediment disturbance and deposition leading to effects on known and unknown heritage assets	Development and adherence to the Detailed Offshore DEMP (see outline version in Volume 3, Appendix 3.4).	No	Minor Adverse (not significant in EIA terms)	No
Direct impact on historic shipwreck sites		No	Minor Adverse (all marine archaeology receptors except for wrecks W02650 and W02781)	No

Summary of Mitigation, Residual Effects and Monitoring

Potential impact	Embedded mitigation	Additional mitigation	Residual effect	Monitoring
			Moderate Adverse (wrecks W02650 and W02781) (not significant in EIA terms)	
Direct impact on unknown heritage assets associated with buried palaeo landscapes		No	Minor Adverse (not significant in EIA terms)	No

11.3 References

Environmental Protection Agency (EPA), 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports. Available at: <https://www.epa.ie> (Accessed: February 2026)

Institute of Environmental Management and Assessment (IEMA), 2024. Impact Assessment Guidelines: Implementing the Mitigation Hierarchy from Concept to Construction. Available at: <https://www.iema.net>

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Office of the Planning Regulator, n.d. Planning Library. Environment and Climate Glossary. Available at: <https://www.opr.ie> (Accessed: June 2026)