Arklow Bank Wind Park 2

Environmental Impact Assessment Report

Volume II, Chapter 24: Summary of Cumulative Effects

sse Renewables

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1.0	09/05/24	Final (External)	GoBe Consultants	GoBe Consultants	Sure Partners Limited

Statement of Authority

Please refer to each topic specific chapter of the EIAR for relevant statements of authority.

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Glossary

Term	Meaning
Arklow Bank Wind Park 1 (ABWP1)	Arklow Bank Wind Park 1 consists of seven wind turbines, offshore export cable and inter-array cables. Arklow Bank Wind Park 1 has a capacity of 25.2 MW. Arklow Bank Wind Park 1 was constructed in 2003/04 and is owned and operated by Arklow Energy Limited. It remains the first and only operational offshore windfarm in Ireland.
Arklow Bank Wind Park 2 – Offshore Infrastructure	"The Proposed Development", Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements under the existing Maritime Area Consent.
Arklow Bank Wind Park 2 (ABWP2) (The Project)	Arklow Bank Wind Park 2 (ABWP2) (The Project) is the onshore and offshore infrastructure. This EIAR is being prepared for the Offshore Infrastructure. Consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operations Maintenance Facility (Planning Reference 211316) has been granted on 26th May 2022 and 20th July 2022, respectively. • Arklow Bank Wind Park 2 Offshore Infrastructure: This includes all elements to be consented in accordance with the Maritime Area Consent. This is the subject of this EIAR and will be referred to as 'the Proposed Development' in the EIAR. • Arklow Bank Wind Park 2 Onshore Grid Infrastructure: This relates to the onshore grid infrastructure for which planning permission has been granted. • Arklow Bank Wind Park 2 Operations and Maintenance Facility (OMF): This includes the onshore and nearshore infrastructure at the OMF, for which planning permission has been granted. • Arklow Bank Wind Park 2 EirGrid Upgrade Works: any non-contestable grid upgrade works, consent to be sought and works to be completed by EirGrid.
Array Area	The Array Area is the area within which the Wind Turbine Generators (WTGs), the Offshore Substation Platforms (OSPs), and associated cables (export, inter-array and interconnector cabling) and foundations will be installed
Cable Corridor and Working Area	The Cable Corridor and Working Area is the area within which export, inter-array and interconnector cabling will be installed This area will also facilitate vessel jacking operations associated with installation of WTG structures and associated foundations within the Array Area.
Cumulative effects	The addition of many minor or significant effects, including effects of other projects, to create a larger, more significant effect.
Environmental Impact Assessment (EIA)	An Environmental Impact Assessment (EIA) is a statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the Directive 2011/92/EU on the assessment of the effects of certain public and private

Term	Meaning
	projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council (EIA Directive).
EirGrid	State-owned electric power transmission system operator (TSO) in Ireland and Transmission Asset Owner (TAO) for the Project's transmission assets.
Landfall	The area in which the offshore export cables make landfall and is the transitional area between the offshore cabling and the onshore cabling.
Maritime Area Consent (MAC)	A consent to occupy a specific part of the maritime area on a non-exclusive basis for the purpose of carrying out a Permitted Maritime Usage strictly in accordance with the conditions attached to the MAC granted on 22nd December 2022 with reference number 2022-MAC-002.
Mitigation Measure	Measure which would avoid, reduce, or offset an impact.
Permitted Maritime Usage	The construction and operation of an offshore windfarm and associated infrastructure (including decommissioning and other works required on foot of any permission for such offshore windfarm).
The Application	The full set of documents that will be submitted to An Bord Pleanála in support of the consent application.
The Developer	Sure Partners Ltd.

Acronyms

Term	Meaning
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
AEZ	Archaeological Exclusion Zone
ALAN	Artificial Lighting at Night
ALARP	As Low as Reasonably Practical
AMP	Archaeology Management Plan
BW	Bathing Waters
CBRA	Cable Burial Risk Assessment
CIA	Cumulative Impact Assessment
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea, 1972
DHLGH	Department of Housing, Local Government and Heritage
DoD	Department of Defence
ECMG	East Coast Monitoring Group
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ERCoP	Emergency Response Cooperation Plan
EVMP	Environmental Vessel Management Plan
FLO	Fisheries Liaison Officer

Term	Meaning
FMMS	Fisheries Management and Mitigation Strategy
GVA	Gross Value Added
HWM	High Water Mark
IAA	Irish Aviation Authority
IEF	Important Ecological Features
INNS	Invasive and Non-Native Species
INISMP	Invasive Non-Indigenous Species Management Plan
IRCG	Irish Coastguard
LAT	Lowest Astronomical Tide
LCA	Landscape Character Area
LMP	Lighting and Marking Plan
MMMP	Marine Mammal Mitigation Plan
MPCP	Marine Pollution Contingency Plan
MW&SQ	Marine Water and Sediment Quality
NMS	National Monuments Service
NSR	Noise Sensitive Receptors
OFLO	Offshore Fisheries Liaison Officer
PAM	Passive Acoustic Monitoring
ROV	Remote Operated Vehicle
SAAO	Special Amenity Area Order
SAC	Special Area of Conservation
SAR	Search and Rescue
SLVIA	Seascape, Landscape and Visual Impact Assessment

Term	Meaning
SOLAS	Safety of Life at Sea
VMP	Vessel Management Plan
WTG	Wind Turbine Generator

Units

Unit	Description
CO_{2eq}	Carbon dioxide equivalent
dB	Decibel (unit used to measure the intensity of sound)
ft	Feet

24 Summary of Cumulative Effects

24.1 Introduction

24.1.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) presents a summary of the potential cumulative effects of the Arklow Bank Wind Park 2 Offshore Infrastructure (hereafter referred to as 'the Proposed Development'). Specifically, this chapter presents a summary of the potential cumulative effects of the Proposed Development, alongside other projects, plans and activities, during the construction, operational and maintenance and decommissioning phases.

24.1.1.2 Cumulative effects are defined as per the Environmental Protection Agency (EPA) Guidelines (EPA, 2022) as:

"*The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant.*"

24.1.1.3 The Cumulative Impact Assessment (CIA) for each topic of the EIAR is presented in Volume II, Chapters 6 to 22. This summary chapter should be read alongside the detailed information contained within each of these technical chapters. The CIA methodology is detailed in Volume III, Appendix 3.2: Cumulative Impact Assessment Screening. This chapter presents the summary of potential cumulative effects tables from each of the EIAR chapters in order to provide a compiled summary of cumulative effects from the Proposed Development.

24.2 Summary

24.2.1 Coastal Processes

24.2.1.1 Chapter 6: Coastal Processes provides a full assessment of the potential cumulative impacts of the Proposed Development on coastal processes. Table 24.1 presents a summary of the potential cumulative effects.

24.2.1.2 The cumulative impacts assessed include: increased suspended sediment concentrations and associated deposition; and presence of infrastructure may lead to changes to tidal currents, wave climate, sediment transport and seabed morphology.

24.2.1.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.1: Summary of potential cumulative environmental impacts, mitigation and monitoring for Coastal Processes

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Increased suspended sediment concentrations and associated deposition	✓ ✓ ✓	Definition and implementation of construction methods, Volume II, Chapter 4: Description of Development and Volume III, Appendix 4.1: Rehabilitation Schedule. Preparation and implementation of environmental monitoring – Cables will be buried where possible and protected where not possible. – Undertaking of post-installation cable burial surveys and periodic monitoring of cables.	C: Low O: Low D: Low	No Coastal Processes receptors sensitive to the impact pathway.	No Coastal Processes receptors sensitive to the impact pathway therefore assessment of effects is not applicable.	None	N/A	N/A
Presence of infrastructure may lead to	× ✓ ×	N/A	O: Low	O: Medium for offshore sandbanks.	O: Slight adverse (not significant in	None	O: Slight adverse (not significant in EIA terms) for	N/A

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
changes to tidal currents, wave climate, sediment transport and seabed morphology				O: For sites designated for physical features – Medium for Wicklow Reef Special Area of Conservation (SAC); and Low sensitivity for Magherabeg Dunes and Buckroney-Brittas Dunes and Fen SACs. O: Medium for coastal receptors below the High Water Mark (HWM).	EIA terms) for offshore sandbanks. O: Not significant for all sites designated for physical features and coastal receptors below HWM.		offshore sandbanks. O: Not significant for sites designated for physical features and coastal receptors below HWM.	

24.2.2 Marine Water and Sediment Quality

24.2.2.1 Chapter 7: Marine Water and Sediment Quality (MW&SQ) provides a full assessment of the potential cumulative impacts of the Proposed Development on MW&SQ. Table 24.2 presents a summary of the potential cumulative effects.

24.2.2.2 The cumulative impacts assessed include: deterioration in water quality due to suspension of sediments; release of sediment bound contaminants from disturbed sediments; and accidental release or spills of materials or chemicals.

24.2.2.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.2: Summary of potential cumulative environmental impacts, mitigation and monitoring for Marine Sediment and Water Quality

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Deterioration in water quality due to suspension of sediments	✓	✓	✓	An Environmental Management Plan (EMP) will be implemented (Volume III, Appendix 25.1); Scour protection will be installed as described in Volume II, Chapter 4: Description of Development; and Development of and adherence to a Rehabilitation Schedule	C: Low O: Low D: Low	C; O; D: Medium for designated Bathing Waters (BW); Low for Coastal and Transitional waterbodies, and the wider marine environment.	C; O; D: Slight adverse for all receptors. (not significant in EIA terms)	None	C; O; D: Slight adverse for all receptors. (not significant in EIA terms)	N/A
Release of sediment bound contaminants from disturbed sediments	✓	✓	✓	An EMP will be implemented (Volume III, Appendix 25.1); Scour protection will be installed as described in Volume II, Chapter 4:	C: Low O: Low D: Low	C; O; D: Low for designated BWs; Medium for designated coastal and transitional waterbodies;	C; O D: Imperceptible to Slight adverse for designated BWs, designated coastal and transitional waterbodies, and the wider marine	None	C; O D: Imperceptible to Slight adverse for designated BWs, designated coastal and transitional waterbodies,	N/A

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		Description of Development; Preparation and Implementation of an Operational and Maintenance; and Development of and adherence to a Rehabilitation Schedule		and Negligible for the wider marine environment.	environment. (Not significant in EIA terms).		and the wider marine environment. (Not significant in EIA terms).	
Accidental release or spills of materials or chemicals	✓ ✓ ✓	An EMP will be implemented (Volume III, Appendix 25.1); A Marine Pollution Contingency Plan (MPCP) will be included in the EMP to ensure plans are in place to manage any marine pollution spills and including key emergency contact details; and	C: Low O: Low D: Low	C; O; D: Low for designated BWs; Medium for designated coastal and transitional waterbodies; and Negligible for the wider marine environment.	C; O; D: Imperceptible to Slight adverse for designated BWs, designated coastal and transitional waterbodies; and for the wider environment. (Not significant in EIA terms).	None	C; O; D: Imperceptible to Slight adverse for designated BWs, designated coastal and transitional waterbodies; and for the wider environment. (Not significant in EIA terms).	N/A

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		Development of and adherence to a Vessel Management Plan (VMP).						

24.2.3 Airborne Noise

24.2.3.1 Chapter 8: Airborne Noise provides a full assessment of the potential cumulative impacts of the Proposed Development on noise sensitive receptors. Table 24.3 presents a summary of the potential cumulative effects.

24.2.3.2 The cumulative impacts assessed include temporary cumulative construction disturbance to ten onshore noise sensitive receptors (NSRs) (NSRs A - J) from piling at the Proposed Development and Codling Wind Park, and the cumulative operational impact assessment takes into account the potential cumulative airborne noise impacts associated with the Proposed Development together with the existing Arklow Bank Wind Park 1 (ABWP1).

24.2.3.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.3: Summary of potential cumulative environmental impacts, mitigation and monitoring for Airborne Noise

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Temporary cumulative airborne noise from piling	✓	×	×	Development of and adherence to a Construction Noise Management Plan.	C: Low during daytime and during evening; Medium during nighttime.	C: Medium	C: Slight during daytime and evening; Moderate during nighttime. (not significant in EIA terms).	Industry standard methods of mitigation using a screen and/or a dolly will be implemented during piling events in evening & night-time periods.	Slight significance (not significant in EIA terms).	In the event of a noise complaint, onshore noise monitoring will be undertaken at NSR to determine noise levels from piling.
Cumulative operational airborne noise	×	✓	×	N/A	O: Low during daytime, evening and nighttime.	O: High	O: Moderate during daytime evening and nighttime (not significant in EIA terms).	None	O: Moderate significance during daytime evening and nighttime (not significant in EIA terms).	N/A

24.2.4 Benthic Subtidal and Intertidal Ecology

24.2.4.1 Chapter 9: Benthic Subtidal and Intertidal Ecology provides a full assessment of the potential cumulative impacts of the Proposed Development on benthic subtidal and intertidal ecology. Table 24.4 presents a summary of the potential cumulative effects.

24.2.4.2 The cumulative impacts assessed include: temporary subtidal habitat loss/disturbance, increased suspended sediment concentrations and associated sediment deposition; injury and/or disturbance from underwater noise and vibration; long term subtidal habitat loss/change; colonisation of hard structures, alteration of seabed habitat arising from effect on physical processes; removal of hard substrates resulting in loss of colonising communities; increased risk of introduction and spread of Invasive and Non-Native Species (INNS); and accidental pollution.

24.2.4.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.4: Summary of potential cumulative environmental impacts, mitigation and monitoring for Benthic, Subtidal and Intertidal Ecology

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Temporary subtidal habitat loss/disturbance	✓	✓	✓	Implementation of an EMP Adherence to the Rehabilitation Schedule. Confirmatory surveys to be undertaken within the Array Area and Cable Corridor and Working Area prior to construction. Adherence to the VMP.	C: Low O: Negligible D: Low	C; O; D: Low for Subtidal Sands', 'Subtidal Coarse and Mixed Sediment' and 'Moderate Energy Subtidal Rock' Important Ecological Features (IEFs); Medium for '*Sabellaria* on Stable Sediments' IEF.	C; D: Slight adverse for Subtidal Sands', 'Subtidal Coarse and Mixed Sediment', 'Moderate Energy Subtidal Rock', and *Sabellaria* on Stable Sediments' IEF (not significant in EIA terms). O: Not significant for Subtidal Sands', 'Subtidal Coarse and Mixed Sediment', 'Moderate Energy Subtidal Rock', and *Sabellaria* on Stable Sediments' IEF (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms). O: Not Significant (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None
Increased suspended sediment concentrations and associated	✓	✓	✓	Installation of scour protection as defined in Volume II, Chapter 4:	C: Low O: Low D: Low	C; O; D: Negligible for '*Sabellaria* on Stable Sediment' and 'Barren Coarse Intertidal	C; O; D: Imperceptible for '*Sabellaria* on Stable Sediment' and 'Barren Coarse	None	C: Imperceptible to Slight adverse (not	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
sediment deposition				Description of Development.		Sediment' IEFs. Low for 'Subtidal Sands', 'Subtidal Coarse and Mixed Sediment' and 'Moderate Energy Subtidal Rock' IEFs. Medium for 'Moderately Exposed Intertidal Rock' IEF.	Intertidal Sediment' IEFs. Slight adverse for 'Subtidal Sands', 'Subtidal Coarse and Mixed Sediment', 'Moderate Energy Subtidal Rock' and 'Moderately Exposed Intertidal Rock' IEFs (not significant in EIA terms).		significant in EIA terms). O: Imperceptible to Slight adverse (not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).	
Injury and/or disturbance from underwater noise and vibration	✓	×	×	Adherence to soft starts and maximum piling energies as set out in Volume II, Chapter 4: Description of Development	C: Low	C: Low	C: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms).	N/A

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Long-term subtidal habitat loss/change	✗	✓	✗	Implementation of the EMP Confirmatory surveys to be undertaken within the Array Area and Cable Corridor and Working Area prior to construction. Implementation of the Invasive Non-Indigenous Species Management Plan (INISMP). Cables will be buried where possible and protected where not possible.	O: Low	O: High	O: Moderate (not significant in EIA terms).	None	O: Moderate (not significant in EIA terms).	N/A
Colonisation of hard structures	✓	✓	✓	Implementation of the EMP Confirmatory surveys to be undertaken within	C: Medium O: Medium	C: Low O: Low D: Low	C: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms).	N/A

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				the Array Area and Cable Corridor and Working Area prior to construction. Adherence to the Rehabilitation Schedule. Implementation of the INISMP	D: Medium		O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).		O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	
Alterations of seabed habitats arising from changes in physical processes	×	✓	×	Volume II, Chapter 4: Description of Development sets out the cable laying techniques, cable burial depths and schedule of O&M activities. Installation of scour protection as defined in Volume II, Chapter 4: Description of Development.	O: Low	O: Negligible	O: Imperceptible (not significant in EIA terms).	None	O: Imperceptible (not significant in EIA terms).	N/A

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Removal of hard structures resulting in loss of colonising communities	×	×	✓	Adherence to the Rehabilitation Schedule.	D: Medium	D: Low	D: Slight adverse (not significant in EIA terms).	None	D: Slight adverse (not significant in EIA terms).	N/A
Increased risk of introduction and spread of invasive and non-native species	✓	✓	✓	Adherence to the INISMP.	C: Low O: Low D: Low	C: Negligible to Medium O: Negligible to Medium D: Negligible to Medium	C: Imperceptible to Slight adverse (not significant in EIA terms). O: Imperceptible to Slight adverse (not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).	None	C: Imperceptible to Slight adverse (not significant in EIA terms). O: Imperceptible to Slight adverse (not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).	N/A

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Accidental pollution	✓	✓	✓	Adherence to the MPCP.	C: Low O: Low D: Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	N/A

24.2.5 Fish, shellfish and sea turtle ecology

24.2.5.1 Chapter 10: Fish, Shellfish and Sea Turtle Ecology provides a full assessment of the potential cumulative impacts of the Proposed Development on fish, shellfish and sea turtle ecology. Table 24.5 presents a summary of the potential cumulative effects.

24.2.5.2 The cumulative impacts assessed include: temporary habitat loss/disturbance; increased suspended sediment and associated deposition; injury and/or disturbance to fish and shellfish from underwater noise and vibration; collision risk to basking shark and sea turtles from vessel activities; accidental pollution; long-term habitat loss; alterations of seabed habitats arising from changes in physical processes and temporary changes in Electromagnetic Fields (EMF) from subsea electrical cabling.

24.2.5.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.5: Summary of potential cumulative environmental impacts, mitigation and monitoring for Fish, Shellfish and Sea Turtle Ecology

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Temporary habitat loss/disturbance	✓	✓	✓	Development of and adherence to a Rehabilitation Schedule. Confirmatory Survey to be undertaken within the Array Area and Cable Corridor and Working Area to verify the presence/ absence of any areas of reef habitat and blue mussel beds.	C: Low O: Low D: Low	C: Negligible to Medium O: Negligible to Medium D: Negligible to Medium	C: Imperceptible to Slight adverse (not significant in EIA terms). O: Imperceptible to Slight adverse (not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).	None	C: Imperceptible to Slight adverse (not significant in EIA terms).	None
Increased suspended sediment concentrations and associated deposition.	✓	✓	✓	Development of and adherence to a Rehabilitation Schedule. Management of bentonite spills	C: Low O: Low D: Low	C: Negligible to Low O: Negligible to Low D: Negligible to Low	C: Imperceptible to Slight adverse (not significant in EIA terms). O: Imperceptible to Slight adverse	None	C: Imperceptible to Slight adverse (not significant in EIA terms). O: Imperceptible to Slight adverse	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				via good working practises. Scour protection will be installed as described in Volume II, Chapter 4: Description of Development.			(not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).		(not significant in EIA terms). D: Imperceptible to Slight adverse (not significant in EIA terms).	
Injury and/or disturbance to fish and shellfish from underwater noise and vibration	✓	✓	×	Development of and adherence to a Rehabilitation Schedule. Implementation of and adherence to Marine Mammal Mitigation Plan (MMMP). Adherence to soft starts and maximum piling energies as set out in Volume II, Chapter 4:	C: Negligible to Medium O: Negligible	C: Low to Medium O: Low to Medium	C: Not significant to Moderate adverse (not significant in EIA terms). O: Not significant in EIA terms.	None	C: Not significant to Moderate adverse (not significant in EIA terms). O: Not significant in EIA terms.	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				Description of Development.						
Injury and/or disturbance to basking shark and sea turtles from increased vessel activities	✓	✓	✓	Commitment to the maximum vessel numbers as set out in Volume II, Chapter 4: Description of Development. Development of and adherence to a Rehabilitation Schedule. Development and issue of an Environmental VMP to all project vessel operators	C: Negligible O: Negligible D: Negligible	C: High O: High D: High	C: Not significant in EIA terms O: Not significant in EIA terms D: Not significant in EIA terms	None	C; O; D: Not significant in EIA terms	None
Accidental pollution from vessels, vehicles,	✓	✓	✓	Development of and adherence to a Rehabilitation Schedule.	C: Low O: Low D: Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms).	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
equipment and machinery				Development of and implementation of an EMP. A Marine Pollution Contingency Plan will be included in the EMP. Development of and implementation of an EMP. A MPCP will be included in the EMP.			O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).		O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	
Long term habitat loss	×	✓	×	Cables will be buried where possible and protected where not possible. Operational and Maintenance asset monitoring commitments	O: Low	O: Negligible to Low	O: Imperceptible to Slight adverse significance (not significant in EIA terms).	None	O: Imperceptible to Slight adverse significance (not significant in EIA terms).	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				include survey of seabed and assets every 6 months for the first two years and annually thereafter (Volume II: Chapter 4: Description of Development).						
Alterations of seabed habitats arising from changes in physical processes	×	✓	×	Development of and adherence to a Rehabilitation Schedule. Scour protection.	O: Low	O: Negligible to Low	O: Imperceptible to Slight adverse significance (not significant in EIA terms).	None	O: Imperceptible to Slight adverse significance (not significant in EIA terms).	None
Temporary changes in EMF from subsea electrical cabling	×	✓	×	Cables will be buried where possible and protected where not possible.	O: Low	O: Low	O: Slight adverse significance (not significant in EIA terms).	None	O: Slight adverse significance (not significant in EIA terms).	None

24.2.6 Marine Mammals

24.2.6.1 Chapter 11: Marine Mammals provides a full assessment of the potential cumulative impacts of the Proposed Development on marine mammals. Table 24.6 presents a summary of the potential cumulative effects.

24.2.6.2 The cumulative impacts assessed include the disturbance to marine mammals from underwater noise.

24.2.6.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.6: Summary of potential cumulative environmental impacts, mitigation and monitoring for Marine Mammals

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Disturbance to marine mammals from underwater noise	✓	×	×	A MMMP will be implemented (see Volume III, Appendix 25.2: Marine Mammal Mitigation Plan).	C: Medium adverse for harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin, minke whale, grey seal, and harbour seal.	C: Low	C: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms).	Monitoring has been proposed to understand the potential for behavioural disturbance to marine mammals during piling. Such monitoring will include both visual monitoring and the use of Passive Acoustic Monitoring (PAM). The details of this monitoring, to be implemented as part of an Environmental Monitoring commitments are set out in Volume II, Chapter 25: Summary of Factored in Measures, Mitigation and Monitoring.

24.2.7 Offshore Ornithology

24.2.7.1 Chapter 12: Offshore Ornithology provides a full assessment of the potential cumulative impacts of the Proposed Development on offshore ornithology. Table 24.7 presents a summary of the potential cumulative effects.

24.2.7.2 The cumulative impacts assessed include: disturbance and displacement; indirect disturbance and displacement resulting from changes to prey species and habitats; and collision risk.

24.2.7.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.7: Summary of potential cumulative environmental impacts, mitigation and monitoring for Offshore Ornithology

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Cumulative direct disturbance and displacement	✓	✓	✓	Environmental Vessel Management Plan (EVMP).	C: Negligible to Low O: Low to Medium D: Negligible	C: High O: Medium D: Medium to High	C: Negligible to Moderate adverse (not significant in EIA terms). O: Slight to Moderate adverse (not significant in EIA terms). D: Not significant.	None	Negligible to Moderate adverse (not significant in EIA terms). O: Slight to Moderate adverse (not significant in EIA terms). D: Not significant.	N/A
Cumulative indirect disturbance and displacement	✓	✓	✓	Best practice vessel and marine machinery operation.	C: Negligible O: Negligible D: Negligible	C: Low to High O: Low to High D: Low to High	C: Not significant. O: Not significant. D: Not significant.	None	C: Not significant. O: Not significant. D: Not significant.	N/A
Cumulative collision risk	×	✓	×	Lower blade tip height of 37m from Lowest Astronomical Tide (LAT)	O: Negligible to Low	O: Low to Medium	O: Not significant to Slight adverse (not significant in EIA terms).	None	O: Not significant to Slight adverse (not significant in EIA terms).	N/A

24.2.8 Offshore Bats

24.2.8.1 Chapter 13: Offshore Bats provides a full assessment of the potential cumulative impacts of the Proposed Development on offshore bats. Table 24.8 presents a summary of the potential cumulative effects.

24.2.8.2 The cumulative impacts assessed include: disturbance and displacement due to anthropogenic noise; disturbance and displacement due to increased vessel activity and infrastructure presence; disturbance and displacement due to Artificial Lighting at Night (ALAN); indirect disturbance and displacement resulting from changes to prey; and collision and barotrauma.

24.2.8.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.8: Summary of potential cumulative environmental impacts, mitigation and monitoring for Offshore Bats

Description of impact	Phase			Factored-in measures	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D					
Disturbance and displacement due to anthropogenic noise	✓	✓	✓	N/A	No significant cumulative effects.	None	No significant cumulative effects.	The Proposed Development is committed to participating in the 'East Coast Monitoring Group' (ECMG), to discuss and agree potential strategic monitoring initiatives in relation to offshore bats. The need for strategic monitoring and the level of participation by individual projects will be determined by the conclusions of the EIAR process, in consultation with statutory and technical stakeholders, and with a focus on validation and evidence gathering.
Disturbance and displacement due to increased vessel activity and infrastructure presence	✓	✓	✓	N/A	No significant cumulative effects.	None	No significant cumulative effects.	The Proposed Development is committed to participating in the ECMG, to discuss and agree potential strategic monitoring initiatives in relation to offshore bats. The need for strategic monitoring and the level of participation by individual projects will be determined by the conclusions of the EIAR process, in consultation with statutory and technical stakeholders, and with a focus on validation and evidence gathering.
Disturbance and displacement due to ALAN	✓	✓	✓	N/A	No significant cumulative effects.	None	No significant cumulative effects.	The Proposed Development is committed to participating in the ECMG, to discuss and agree potential strategic monitoring initiatives in relation to offshore bats. The need for strategic monitoring and the level of participation by individual projects will be determined by the conclusions of the EIAR process, in consultation with statutory and

Description of impact	Phase			Factored-in measures	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D					
								technical stakeholders, and with a focus on validation and evidence gathering.
Indirect disturbance and displacement resulting from changes to prey	✓	✓	✓	N/A	No significant cumulative effects.	None	No significant cumulative effects.	The Proposed Development is committed to participating in the ECMG, to discuss and agree potential strategic monitoring initiatives in relation to offshore bats. The need for strategic monitoring and the level of participation by individual projects will be determined by the conclusions of the EIAR process, in consultation with statutory and technical stakeholders, and with a focus on validation and evidence gathering.
Collision and Barotrauma	×	✓	×	Lower blade tip height of 37m from LAT. Number of turbines. Rehabilitation Schedule	No significant cumulative effects.	None	No significant cumulative effects.	The Proposed Development is committed to participating in the ECMG, to discuss and agree potential strategic monitoring initiatives in relation to offshore bats. The need for strategic monitoring and the level of participation by individual projects will be determined by the conclusions of the EIAR process, in consultation with statutory and technical stakeholders, and with a focus on validation and evidence gathering.

24.2.9 Commercial Fisheries and Aquaculture

24.2.9.1 Chapter 14: Commercial Fisheries and Aquaculture provides a full assessment of the potential cumulative impacts of the Proposed Development on commercial fisheries and aquaculture. Table 24.9 presents a summary of the potential cumulative effects.

24.2.9.2 The cumulative impacts assessed include: loss of grounds or restricted access to fishing grounds within the Array Area; loss of grounds or restricted access to fishing grounds within the Cable Corridor and Working area; displacement of fishing activity into other areas; and effects on commercially exploited species.

24.2.9.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.9: Summary of potential cumulative environmental impacts, mitigation and monitoring for Commercial Fisheries and Aquaculture

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Loss of grounds or restricted access to fishing grounds within the Array Area	✓	✓	✓	Fisheries Management and Mitigation Strategy (FMMS); Fisheries Liaison Officer (FLO); Offshore Fisheries Liaison Officer (OFLO); CBRA; Advisory safety zones; Construction Programme and Construction Methodology; EMP; Pre and Post-Construction surveys; Operational and Maintenance Activities Methodology; Lighting and Marking Plan;	C: Negligible to Low O: Negligible to Low D: Negligible to Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Not Significant to Slight adverse. O: Not Significant to Slight adverse. D: Not Significant to Slight adverse.	None	C; O; D: Not Significant to Slight adverse (not significant in EIA terms).	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				Rehabilitation Schedule						
Loss of grounds or restricted access to fishing grounds within the Cable Corridor and Working Area	✓	✓	✓	FMMS; FLO; OFLO; CBRA; Advisory safety zones; Construction Programme and Construction Methodology; EMP; Pre and Post-Construction surveys; Operational and Maintenance Activities Methodology; Lighting and Marking Plan; Rehabilitation Schedule	C: Negligible to Low O: Negligible to Low D: Negligible to Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Not Significant to Slight adverse. O: Not Significant to Slight adverse. D: Not Significant to Slight adverse.	None	C; O; D: Not Significant to Slight adverse (not significant in EIA terms).	None
Displacement of fishing activity into other areas	✓	✓	✓	FMMS; FLO; OFLO; CBRA; Advisory safety zones; Construction Programme	C: Negligible to Low O: Negligible to Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Not Significant to Slight adverse. O: Not Significant to	None	C; O; D: Not Significant to Slight adverse (not significant in EIA terms).	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				and Construction Methodology; EMP; Pre and Post-Construction surveys; Operational and Maintenance Activities Methodology; Rehabilitation Schedule	D: Negligible to Low		Slight adverse. D: Not Significant to Slight adverse.			
Effects on commercially exploited species	✓	✓	✓	As per Fish, Shellfish and Sea Turtle Ecology Chapter	C: Low O: Low D: Low	C: Low to Medium O: Low to Medium D: Low to Medium	C: Slight adverse O: Slight adverse D: Slight adverse	None	C; O; D: Slight adverse (not significant in EIA terms).	None

24.2.10 Shipping and navigation

24.2.10.1 Chapter 15: Shipping and Navigation provides a full assessment of the potential cumulative impacts of the Proposed Development on shipping and navigation. Table 24.10 presents a summary of the potential cumulative effects.

24.2.10.2 The cumulative impacts assessed include: displacement of vessel traffic; port access restrictions; increased collision risk; increased allision risk; and diminished emergency response capability.

24.2.10.3 Overall, it is concluded that there will be no significant cumulative effects arising from the Proposed Development alongside other projects, plans and activities.

Table 24.10: Summary of potential cumulative environmental impacts, mitigation and monitoring for Shipping and Navigation

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Frequency of Occurrence	Severity of Consequence	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Displacement of Vessel Traffic	✓	✓	✓	• Charting of all structures • Implementation of a buoyed construction/ decommissioning area • Implementation of VMP • Implementation of MPCP • Circulation of information	C: Reasonable Probable O: Remote D: Reasonable Probable	C: Minor O: Minor D: Minor	C: Tolerable and As Low As Reasonably Practical (ALARP) (not significant in EIA terms). O: Broadly Acceptable (not significant in EIA terms). D: Tolerable and ALARP (not significant in EIA terms).	None	C; D: Tolerable and ALARP O: Broadly acceptable (not significant in EIA terms).	Traffic Monitoring
Port Access Restrictions	✓	✓	✓	• Circulation of information • Marine coordination • Implementation of VMP	C: Remote O: Extremely unlikely D: Remote	C: Minor O: Minor D: Minor	C; O; D: Broadly acceptable (not significant in EIA terms).	None	C; O; D: Broadly acceptable (not significant in EIA terms).	Traffic Monitoring
Increased Collision Risk	✓	✓	✓	• Circulation of information. • Marine coordination. Convention on the International	C: Extremely unlikely	C: Serious O: Serious D: Serious	C; O; D: Tolerable and ALARP (not significant in EIA terms).	None	C; O; D: Tolerable (not significant in EIA terms).	Traffic Monitoring

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Frequency of Occurrence	Severity of Consequence	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				Regulations for Preventing Collisions at Sea, 1972 (COLREGs) / Safety of life at sea (SOLAS) compliance. • Implementation of VMP. • Implementation of MPCP. • Implementation of an Emergency Response Cooperation Plan (ERCoP).	O: Extremely unlikely D: Extremely unlikely					
Increased Allision Risk	✓	✓	✓	• Advisory safety zones. • Circulation of information. • Charting of all structures. • Lighting and marking. • Implementation of VMP. • Implementation of MPCP. • Implementation of ERCoP.	C: Extremely unlikely O: Extremely unlikely D: Extremely unlikely	C: Serious O: Serious D: Serious	C: Tolerable and ALARP (not significant in EIA terms). O: Tolerable and ALARP (not significant in EIA terms). D: Tolerable and ALARP (not significant in EIA terms).	None	C; O; D: Tolerable and ALARP (not significant in EIA terms).	Traffic Monitoring

Description of impact	Phase			Factored-in measures	Frequency of Occurrence	Severity of Consequence	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Diminished Emergency Response Capability	✓	✓	✓	• Provision of self-help capability • Implementation of ERCoP • Implementation of MPCP	C: Extremely unlikely O: Extremely unlikely D: Extremely unlikely	C: Serious O: Serious D: Serious	C; O; D: Tolerable and ALARP (not significant in EIA terms).	None	C; O; D: Tolerable and ALARP (not significant in EIA terms).	Traffic Monitoring

24.2.11 Civil and military aviation and radar

24.2.11.1 Chapter 16: Civil and Military Aviation provides a full assessment of the potential cumulative impacts of the Proposed Development on civil and military aviation and radar. Table 24.11 presents a summary of the potential cumulative effects.

24.2.11.2 The cumulative impacts assessed include: creation of physical obstacles affecting air traffic.

24.2.11.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.11: Summary of potential cumulative environmental impacts, mitigation and monitoring for Civil and Military Aviation

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Creation of physical obstacles affecting air traffic	✓	✓	✓	Installation of appropriate lighting and marking in accordance with Irish Aviation Authority (IAA) guidance and specific DoD requirements to ensure compatibility with night vision equipment. IAA, DoD and Irish Coastguard (IRCG) consulted to ensure final layout is compatible with Search and Rescue (SAR) helicopter operations and DoD aviation operations, and that night vision equipment requirements are met.	C: Negligible O: Negligible D: Negligible	C: High O: High D: not significantHigh	C; O; D: Not significant in EIA terms.	None	C; O; D: Not significant in EIA terms.	None

24.2.12 Seascape, landscape and visual impact assessment

24.2.12.1 Chapter 17: Seascape, Landscape and Visual Impact Assessment (SLVIA) provides a full assessment of the potential cumulative impacts of the Proposed Development on seascape, landscape and visual resources. Table 24.12 presents a summary of the potential cumulative effects.

24.2.12.2 The cumulative impacts assessed include: visual effects, seascape effects, landscape character effects and landscape designation effects.

24.2.12.3 A preliminary assessment has been undertaken to review the potential for cumulative effects from the representative viewpoints and due to the lack of visibility of the other Phase 1 projects, several viewpoints have been scoped out of further assessment due to there being no likelihood of significant cumulative effects. Viewpoints that are assessed as having no significant cumulative effects due to the lack of visibility of the other Phase 1 projects (and therefore no potential for cumulative effect) are:

- Viewpoint 3 Ballynacarrig 3rd Class Road;
- Viewpoint 4 Ballynacarrig public house;
- Viewpoint 6 Tongelee 3rd Class Road;
- Viewpoint 9 Johnstown N11/M11;
- Viewpoint 12 Moneyribbin 3rd Class Road;
- Viewpoint 20 Curracloe Beach;
- Viewpoint 21 Barnacleagh Minor Road; and
- Viewpoint 22 Johnstown Coast Road.

24.2.12.4 Overall, it is concluded that there will be significant cumulative effects from the Proposed Development alongside other projects/plans.

24.2.12.5 Significant adverse cumulative effects have been identified in relation to:

- Visual receptors at 6 of the 29 viewpoints.
- Visual receptors travelling along parts of the R750, Dublin – Cherbourg ferry route and railway line between Greystones – Wicklow. Receptors along other parts of these routes will not experience significant effects.
- Two seascape character receptors, comprising the RSCA13: South East Irish Sea and RSCA14: Irish Sea, Sandbanks and Broad Bays, where the cumulative effect resulting from the addition of the Proposed Development with the influence of both Codling Wind Park and Dublin Array, will likely result in the seascape being partially defined by the influence of offshore wind turbine generators (WTGs) as a key characteristic of the seascape character.
- Three landscape character receptors, comprising the Southern Coastal Area (Wicklow) Landscape Character Area (LCA), Northern Coastal Area (Wicklow) LCA and Coastal (Wexford) LCA.

24.2.12.6 With regards to cumulative effects with other proposed Phase 1 developments Codling Wind Park and Dublin Array, it is considered that these developments, which lie north of the Proposed Development, would be visible sequentially in combination with the Proposed Development if these developments are approved. The proposed turbines associated with Codling Bank and Dublin Array would be seen as a distinct and separate development when viewed from northern portions of the SLVIA Study Area with visual impacts localised and large during the operational phase, giving rise to a significant seascape, landscape and visual cumulative effect should these developments be approved.

Table 24.12: Summary of potential cumulative environmental impacts, mitigation and monitoring for SLVIA

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Cumulative Visual Effects (Phase 1 Projects CIA)										
Viewpoint 1: Wicklow Head	✓	✓	✓	Adherence to a Lighting and Marking Plan (LMP) (Volume III, Appendix 25.6) Adherence to a Rehabilitation Schedule (Volume III, Appendix 4.1). Promulgation of information to the IAA. Layout design. Charting of all structures associated with the Proposed Development on relevant nautical and electronic charts (Volume III, Appendix 25.7:	Medium-low / high	High	Major (significant in EIA terms), moderate (significant in EIA terms)	None	Major (significant in EIA terms), moderate (significant)	N/A
Viewpoint 2: Blainroe Golf Club	✓	✓	✓		High	Medium-high	Major (significant in EIA terms)	None	Major (significant in EIA terms)	N/A
Viewpoint 5: Brittas Bay Beach	✓	✓	✓		High	High	Major (significant in EIA terms)	None	Major (significant in EIA terms)	N/A
Viewpoint 7: Ballinvally 3rd Class Road	✓	✓	✓		Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 8: Ballinaskea 3rd Class Road	✓	✓	✓		Medium	Medium-high	Moderate (significant in EIA terms)	None	Moderate (significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Viewpoint 10: Ferry Bank, Arklow	✓	✓	✓	Vessel Management Plan). Aviation lighting (Volume III, Appendix 25.6: Lighting and Marking Plan).	Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 11: Arklow Town	✓	✓	✓		Low	Medium-high	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A
Viewpoint 13: Clogga Amenity Area	✓	✓	✓		Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 14: Kilmichael Point	✓	✓	✓		Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 15: Clones Coast Road	✓	✓	✓		Low	High	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A
Viewpoint 16: Tara Hill Minor Road	✓	✓	✓		Low	High	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Viewpoint 17: Ballymoney Beach	✓	✓	✓		Negligible	High	Minor (not significant in EIA terms)	None	Minor (not significant in EIA terms)	N/A
Viewpoint 18: Courtown Harbour Beach	✓	✓	✓		Negligible	Medium-high	Minor (not significant in EIA terms)	None	Minor (not significant in EIA terms)	N/A
Viewpoint 19: Cahore Point	✓	✓	✓		Negligible	High	Minor (not significant in EIA terms)	None	Minor (not significant in EIA terms)	N/A
Viewpoint 23: Kileagh Minor Road	✓	✓	✓		Low	Medium-high	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A
Viewpoint 24: Mizen Head	✓	✓	✓		High	High	Major (significant in EIA terms)	None	Major (significant in EIA terms)	N/A
Viewpoint 25: Newcastle Beach	✓	✓	✓		Medium	Medium-high	Moderate (significant in EIA terms)	None	Moderate (significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Viewpoint 26: Scarr Mountain	✓	✓	✓		Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 27: Tara Hill Track	✓	✓	✓		Low	High	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A
Viewpoint 28: Greystones Cliff Walk	✓	✓	✓		Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A
Viewpoint 29: Sorrento Park	✓	✓	✓		Low	High	Moderate-minor (not significant in EIA terms)	None	Moderate-minor (not significant in EIA terms)	N/A
R750	✓	✓	✓		High	Medium	Major-moderate (significant in EIA terms)	None	Major-moderate (significant in EIA terms)	N/A
Dublin – Cherbourg ferry	✓	✓	✓		High	Medium-high	Major (significant in EIA terms)	None	Major (significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Railway between Greystones and Wicklow	✓	✓	✓		Medium	Medium-high	Moderate (significant in EIA terms), moderate (not significant in EIA terms)	None	Moderate (significant in EIA terms), moderate (not significant in EIA terms)	N/A
Cumulative seascape effects (Phase 1 Projects CIA)										
RSCA13: South East Irish Sea	✓	✓	✓	Adherence to a Lighting and Marking Plan (LMP) (Volume III, Appendix 25.6) Adherence to a Rehabilitation Schedule (Volume III, Appendix 4.1). Promulgation of information to the IAA. Layout design. Charting of all structures associated with the Proposed	High	High	Major (significant in EIA terms)	None	Major (significant in EIA terms)	N/A
RSCA14: Irish Sea, Sandbanks and Broad Bays	✓	✓	✓		Medium-high	Medium-high	Major-moderate (significant in EIA terms)	None	Major-moderate (significant in EIA terms)	N/A

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				Development on relevant nautical and electronic charts (Volume III, Appendix 25.7: Vessel Management Plan). Aviation lighting (Volume III, Appendix 25.6: Lighting and Marking Plan).						
Cumulative landscape character effects (Phase 1 Projects CIA)										
Southern Coastal Area (Wicklow) LCA	✓	✓	✓	Adherence to a Lighting and Marking Plan (LMP) (Volume III, Appendix 25.6) Adherence to a Rehabilitation	Medium	High	Major-moderate (significant in EIA terms)	None	Major-moderate (significant in EIA terms)	N/A
Northern Coastal Area (Wicklow) LCA	✓	✓	✓		Medium-low	Medium-high	Moderate (significant in EIA terms)	None	Moderate (significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Coastal (Wexford) LCA	✓	✓	✓	Schedule (Volume III, Appendix 4.1). Promulgation of information to the IAA. Layout design. Charting of all structures associated with the Proposed Development on relevant nautical and electronic charts (Volume III, Appendix 25.7: Vessel Management Plan). Aviation lighting (Volume III, Appendix 25.6: Lighting and Marking Plan).	Medium-low	Medium-high	Moderate (significant in EIA terms)	None	Moderate (significant in EIA terms)	N/A
Cumulative landscape designation effects (Phase 1 Projects CIA)										

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Bray Head Special Amenity Area Order (SAAO)	✓	✓	✓	Adherence to a Lighting and Marking Plan (LMP) (Volume III, Appendix 25.6). Adherence to a Rehabilitation Schedule (Volume III, Appendix 4.1). Promulgation of information to the IAA. Layout design. Charting of all structures associated with the Proposed Development on relevant nautical and electronic charts (Volume III, Appendix 25.7: Vessel Management Plan). Aviation lighting (Volume III, Appendix 25.6:	Medium-low	High	Moderate (not significant in EIA terms)	None	Moderate (not significant in EIA terms)	N/A

Description of impact	Phase			Factored-in measures	Magnitude of change	Sensitivity of Change	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
				Lighting and Marking Plan).						

24.2.13 Marine archaeology and cultural heritage

24.2.13.1 Chapter 18: Marine Archaeology and Cultural Heritage provides a full assessment of the potential cumulative impacts of the Proposed Development on marine archaeology and cultural heritage. Table 24.13 presents a summary of the potential cumulative effects.

24.2.13.2 The cumulative impacts assessed include: sediment disturbance and deposition leading to effects on known and unknown heritage assets; direct impact on historic shipwreck sites; direct impact on buried palaeo-landscapes; and indirect impact on the setting of terrestrial cultural heritage assets.

24.2.13.3 It is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects/plans on marine archaeology. It is concluded that there will be one significant cumulative effect arising from the Proposed Development alongside other projects, plans and activities, for indirect impact on the setting of terrestrial cultural heritage assets during the construction and the operational and maintenance phase.

Table 24.13: Summary of potential cumulative environmental impacts, mitigation and monitoring for Marine Archaeology and Cultural Heritage

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Sediment disturbance and deposition leading to effects on known and unknown heritage assets	✓	✓	×	Archaeological Exclusion Zones (AEZ) will be established around each known shipwreck site and potential site, within which no installation activities should take place. The AEZs are set out in Volume III, Appendix 18.1: Marine Archaeology and Cultural Heritage Technical Report, and in Volume III, Appendix 25.9: Archaeological Management Plan (AMP). In the event that site preparation and installation works are unable to avoid activities within an AEZ, the works can only proceed with the consent of the	C: Negligible O: Negligible	C: High O: High	C: Not significant in EIA terms O: Not significant in EIA terms	None	C; O: Not significant in EIA terms	N/A

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		National Monuments Service (NMS). Confirmatory marine geophysical surveys, Remote Operated Vehicles (ROV) surveys and geotechnical surveys conducted for the Proposed Development prior to construction will be reviewed by a maritime archaeologist as part of the project design team and the findings will be communicated to the NMS and will inform the need for micro-siting. An Archaeology Management Plan (AMP) has been prepared to inform the construction, operational and						

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		maintenance and decommissioning phases of works. The AMP is provided in Volume III, Appendix 25.9: Archaeological Management Plan. The AMP sets out the principal protocols that the Developer will put in place to ensure the protection of archaeological heritage through the course of the project lifetime. The AMP facilitates the recording and reporting of any archaeological material discovered during project lifetime should this occur. The AMP addresses protocols for archaeological monitoring of works where the recovery of						

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		material to the surface is possible. The AMP addresses protocols for recording and reporting observations where the recovery of material to the surface is not possible and where the seabed has already been surveyed comprehensively and no archaeological features recorded. The AMP addresses protocols for archaeological inputs when a discovery of archaeological material is made. The principle of avoidance has informed the design process, whereby impacts on known						

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				archaeological sites have been avoided wherever possible. Project maritime archaeologists, operating under licence from the Department of Housing, Local Government and Heritage (DHLGH), will be engaged on the project to monitor construction activities and observe any works where material of archaeological importance may be uncovered. Adherence to the Rehabilitation Schedule; (Volume III, Appendix 4.1).						
Direct impact on historic shipwreck sites.	✓	✓	×	As per the measures impact 1 - Sediment disturbance and	C: Negligible	C: High O: High	C: Not significant in EIA terms	None	C; O: Not significant in EIA terms	N/A

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				deposition leading to effects on known and unknown heritage assets.	O: Negligible		O: Not significant in EIA terms			
Direct impact on buried palaeo-landscapes.	✓	✓	×	As per the measures impact 1 - Sediment disturbance and deposition leading to effects on known and unknown heritage assets.	C: Negligible O: Negligible	C: High O: High	C: Not significant in EIA terms O: Not significant in EIA terms	None	C; O: Not significant in EIA terms	N/A
Indirect impact on the setting of terrestrial cultural heritage sites	✓	✓	✓	N/A	C: Medium O: Medium D: Low	C: High O: High D: High	C: Significant in EIA terms O: Significant in EIA terms D: Moderate (Not significant in EIA terms)	C: None O: None D: None	C: Significant in EIA terms O: Significant in EIA terms D: Moderate (Not significant in EIA terms)	None

24.2.14 Infrastructure and other users

24.2.14.1 Chapter 19: Infrastructure and Other Users provides a full assessment of the potential cumulative impacts of the Proposed Development on infrastructure and other users. Table 24.14 presents a summary of the potential cumulative effects.

24.2.14.2 The cumulative impacts assessed include: displacement of other users due to the physical presence of infrastructure; displacement of other users due to increased vessel movements; increased suspended sediment concentrations and associated deposition affecting recreational diving sites and recreational fishing activities; and restrictions to potential aggregate resource availability.

24.2.14.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.14: Summary of potential cumulative environmental impacts, mitigation and monitoring for Infrastructure and Other Users

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Displacement of other users due to the physical presence of infrastructure	✓	✓	✓	Notices to Mariners (NtM) advising of the location, nature and timing of activities; information and notices posted at the Landfall; database of known users (including local yacht clubs, local dive clubs and local recreational activity centres) to act as a mailing list for direct issue of Notices to Mariners	C: Low O: Low D: Low	C: Medium O: Medium D: Medium	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None
Displacement of other users due to increased vessel movements	✓	✓	✓	NtM advising of the location, nature and timing of activities; information and notices posted at the Landfall; database of known users (including local yacht clubs, local dive clubs and local recreational activity centres) to act as a mailing list for direct issue of	C: Low O: Low D: Low	C: Medium O: Medium D: Medium	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not	None	C: Slight adverse (not significant in EIA terms). O: Slight adverse (not significant in EIA terms). D: Slight adverse (not	None

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
				Notices to Mariners; appointment of a Community Engagement Manager during the pre-construction and construction phase			significant in EIA terms).		significant in EIA terms).	
Increased suspended sediment concentrations and associated deposition affecting recreational diving sites and recreational fishing	✓	✓	✓	NtM advising of the location, nature and timing of activities; database of known users (including local dive clubs) to act as a mailing list for direct issue of Notices to Mariners; appointment of a Community Engagement Manager during the pre-construction and construction phase	C: Low O: Negligible D: Low	C: Medium O: Medium D: Medium	C: Slight adverse (not significant in EIA terms). O: Imperceptible adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms). O: Imperceptible adverse (not significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None
Restrictions to potential aggregate resource availability	✓	✓	✓	NtM advising of the location, nature and timing of activities; information and notices posted at the Landfall;	C: Negligible O: Negligible	C: Low O: Low D: Low	C; O; D: Imperceptible adverse (not	None	C; O; D: Imperceptible adverse (not	None

Description of impact	Phase C O D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
		database of known users.	D: Negligible		significant in EIA terms)		significant in EIA terms).	

24.2.15 Air quality and climate

24.2.15.1 Chapter 20: Air Quality and Climate provides a full assessment of the potential cumulative impacts of the Proposed Development on air quality and climate. Table 24.15 presents a summary of the potential cumulative effects.

24.2.15.2 The cumulative impacts assessed include: changes in emissions to atmosphere.

24.2.15.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities during the construction and decommissioning phases, and major beneficial (significant in EIA terms) cumulative effects from the Proposed Development alongside other projects, plans and activities during the operational and maintenance phase.

Table 24.15: Summary of potential cumulative environmental impacts, mitigation and monitoring for Air Quality and Climate

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Changes in emission to atmosphere	✓	✓	✓	An Environmental Management Plan (EMP) will be implemented (Volume III, Appendix 25.1: Environmental Management Plan)	C: Low O: High D: Low	C: Medium O: Medium D: Medium	C: Slight adverse (not significant in EIA terms). O: Major beneficial (significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None	C: Slight adverse (not significant in EIA terms). O: Major beneficial (significant in EIA terms). D: Slight adverse (not significant in EIA terms).	None

24.2.16 Population and human health

24.2.16.1 Chapter 21: Population and Human Health provides a full assessment of the potential cumulative impacts of the Proposed Development on population and human health. Table 24.16 presents a summary of the potential cumulative effects.

24.2.16.2 The cumulative impacts assessed include: Increase in Gross Value Added (GVA); increase in employment; tourism economy impact; tourism and recreation asset impacts; and residential amenities and community asset impacts

24.2.16.3 Overall, it is concluded that there will be no significant cumulative effects from the Proposed Development alongside other projects, plans and activities.

Table 24.16: Summary of potential cumulative environmental impacts, mitigation and monitoring for Population and Human Health

Description of impact	Phase C	Phase O	Phase D	Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
Increase in Gross Value Added (GVA)	✓	✓	✓	Appointment of a Community Engagement Manager during the pre-construction and construction phase.	C: High (Positive) O: High (Positive) D: High (Positive)	Local area: Medium Ireland: Low	C; O; D: Significant (Positive) in the local area; moderate (Positive) in Ireland.	None	C; O; D: Significant (Positive) in the local area; moderate (Positive) in Ireland.	None
Increase in Employment	✓	✓	✓	Appointment of a Community Engagement Manager during the pre-construction and construction phase.	C: High (Positive) O: High (Positive) D: High (Positive)	Local area: Medium Ireland: Low	C; O; D: Significant (Positive) in the local area; moderate (Positive) in Ireland.	None	C; O; D: Significant (Positive) in the local area; moderate (Positive) in Ireland.	None
Tourism Economy Impact	✓	✓	✓	Appointment of a Community Engagement Manager during the pre-construction and construction phase.	C; O; D: Negligible	Local area: Medium	C; O; D: Not significant.	None	C; O; D: Not significant.	None

Description of impact	Phase			Factored-in measures	Magnitude of impact	Sensitivity of Receptors	Significance of effect	Additional measures	Residual effect	Proposed monitoring
	C	O	D							
Tourism and Recreation Asset Impacts	✓	✓	✓	Appointment of a Community Engagement Manager during the pre-construction and construction phase.	C: Negligible O: Negligible D: Negligible	C: Negligible to Low O: Negligible to Low D: Negligible to Low	C: Not significant to Imperceptible adverse. O: Not significant to Imperceptible adverse. D: Not significant to Imperceptible adverse.	None	C; O; D: Not significant to Imperceptible adverse.	None
Residential Amenities and Community Asset Impacts	✓	✓	✓	Appointment of a Community Engagement Manager during the pre-construction and construction phase.	C: Negligible O: Negligible D: Negligible	C: Low O: Low D: Low	C: Not significant O: Not significant D: Not significant	None	C: Not significant O: Not significant D: Not significant	None

24.3 References

Environmental Protection Agency (EPA) (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports.

UNECE (2021) Environmental monitoring, available at: https://unece.org/environmental-monitoring [Accessed 19/03/2024].