

Arklow Bank Wind Park 2

Derogation Licence Application

Supporting Document – Application for Reg 54 Derogation (July 2026)

sse Renewables

Table of Contents

TABLE OF CONTENTS ..... **I**
FIGURES II
TABLES II
GLOSSARY ..... **IV**
ACRONYMS ..... **VI**
1 INTRODUCTION **1**
1.1 OVERVIEW 1
1.2 OBJECTIVE OF THE PROPOSED WORKS 1
1.3 CONTRIBUTING EXPERTS 4
2 BACKGROUND **8**
2.1 OVERVIEW 8
2.2 PURPOSE OF THE DOCUMENT 8
2.3 RELEVANT GUIDANCE 8
2.4 EXISTING INFORMATION 10
3 THE PROPOSED ACTIVITY **13**
3.1 OVERVIEW 13
3.2 SCREENING OF PROPOSED ACTIVITIES 13
3.3 RISK ASSESSMENT 18
4 ECOLOGICAL SURVEY AND SITE ASSESSMENT **38**
4.2 PRE-EXISTING INFORMATION ON SPECIES AT LOCATION AND ENVIRONS 38
4.3 STATUS OF THE SPECIES IN THE LOCAL/REGIONAL AREA 45
4.4 OBJECTIVE(S) OF SURVEY 46
4.5 DESCRIPTION OF SURVEY AREA 47
4.6 SURVEY METHODOLOGY 49
4.7 SURVEY RESULTS 51
4.8 POPULATION SIZE CLASS ASSESSMENT 51
5 EVIDENCE TO SUPPORT THE DEROGATION TESTS **59**
5.1 TEST 1 - REASON FOR DEROGATION 59
5.2 TEST 2 - ABSENCE OF ALTERNATIVE SOLUTIONS 76
5.3 TEST 3 - IMPACT OF A DEROGATION ON CONSERVATION STATUS 97
6 MONITORING THE IMPACTS OF THE DEROGATION **113**
6.1 MONITORING PROPOSALS 113
6.2 REPORTING MECHANISMS 113
7 CONCLUSION **115**
8 REFERENCES **116**

ANNEXES TO THIS REPORT ..... **I**

Figures

Figure 1: The Proposed Development....1
Figure 2: Location of Proposed Activities – Project Design Option 1....2
Figure 3: Location of Proposed Activities – Project Design Option 2....3
Figure 4: Marine Mammal Study Areas....48

Tables

Table 3-1: Justification for no pathway for some Regulation 51 Impacts to occur (parts a, c, d and e) 13
Table 3-2: Description of the Proposed Activities and the potential for a Regulation 51 Impact to occur.....15
Table 3-3: Justification of Proposed Activities that have been screened out of further consideration of deliberate disturbance to Annex IV cetaceans....22
Table 3-4: PTS-onset from pile driving at the all locations based on the extended ramp-up mitigation scenario....26
Table 3-6: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population....30
Table 3-7: Estimated source levels for dredging and trenching....34
Table 3-8: Weighted LE,p,24h,wtd impact ranges for marine mammals using the Southall *et al.* (2019) non-impulsive criteria for the dredging and trenching assuming a fleeing receptor....34
Table 3-9: Predicted impact of disturbance to marine mammals from dredging and trenching assuming a 5 km radius....35
Table 4-1: PTS-onset from pile driving at the all locations based on the extended ramp-up mitigation scenario....53
Table 4-2: TTS-onset from pile driving at WTG and OSP locations based on the extended ramp-up mitigation scenario....55
Table 4-3: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population....57
Table 5-1: Other relevant policy documents....67
Table 5-2: Comparison of Annual Emissions in 2023 and 2030 and Estimated Carbon Savings....75
Table 5-3: Summary of the consideration of satisfactory alternative location of activity requiring derogation including comparison of impact on Annex IV species....80
Table 5-4: Summary of the consideration of satisfactory alternative scale of activity requiring derogation (i.e. number of structures for the WTGs and OSPs)....81
Table 5-5: Summary of the consideration of satisfactory alternative design and layout of activities 83
Table 5-6: Summary of the consideration of satisfactory alternative type of activities (foundation type) 86
Table 5-7: Comparison of technical considerations for monopile installation....89

Table 5-8: Summary of seasonal sensitivities for Annex IV marine mammals 91

Table 5-9: Summary of the consideration of satisfactory alternative timing and sequencing of activities 93

Table 5-11: Summary of the consideration of satisfactory alternative intensity of activity requiring derogation (i.e. maximum hammer energy) 96

Table 5-12: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population 100

Table 5-13: Applicant experience with mitigation measures for activity requiring derogation (piling) 106

Table 5-14: Marine Mammal Mitigation Measures for Impact Piling Activities 109

Glossary

Term	Definition
Annex IV Risk Assessment	Information provided to the competent authority to inform a risk assessment for Annex IV species under Article 12 of the Habitats Directive (Council Directive 92/43/EEC)
Arklow Bank Wind Park 1	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 Megawatt (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	Arklow Bank Wind Park 2 (ABWP2) is a proposed offshore wind farm (OWF) in the Irish Sea, situated on and around Arklow Bank, approximately 6-15 km to the east of Arklow in County Wicklow.
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. The ABWP2 array area is illustrated on Figure 1.
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.
Cetacean	The order Cetacea includes whales, dolphins and porpoises and is collectively known as cetaceans.
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 projects on the environment as amended by Directive 2014/52/EU of the European Parliament and of the Council (EIA Directive).
Environmental Impact Assessment Report (EIAR)	An Environmental Impact Assessment Report (EIAR) is a report of the effects, if any, which the proposed project, if carried out, would have on the environment. It is prepared by the developer to inform the Environmental Impact Assessment process.
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Transposed into Irish Law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011).
MAC Area	The area in which the Proposed Development is seeking consent. The MAC Area includes the offshore export cable corridors and Array Area.
Maritime Area Consent (MAC)	A consent to occupy a specific part of the maritime area on a nonexclusive basis for the purpose of carrying out a Permitted Maritime Usage strictly in accordance with

Term	Definition
	the conditions attached to the MAC granted on 22nd December 2022 with reference number 2022-MAC-002.
Maritime Area Regulatory Authority (MARA)	MARA is a body under the aegis of the Department of Housing, Local Government and Heritage, whose functions are set out in the Maritime Area Planning Act 2021. MARA are responsible for managing the existing foreshore consent portfolio and processing Maritime Usage Licences and Maritime Area Consents.
Mitigation Measure	Measure which would avoid, reduce, or remediate an impact.
National Parks and Wildlife Service (NPWS)	The National Parks and Wildlife Service (NPWS) manages the Irish State's nature conservation responsibilities. As well as managing the national parks, the activities of the NPWS include the designation and protection of Natural Heritage Areas, Special Areas of Conservation and Special Protection Areas.
Proposed Activities	All of the site investigations and baseline surveys the subject of the Maritime Usage Licence Application (EIAR Volume II, Chapter 4: Description of Development).
Proposed Development	Equivalent to Arklow Bank Wind Park 2 (ABWP2)
Receptor	Environmental component that may be affected, adversely or beneficially, by an impact.
Special Area of Conservation (SAC)	Areas of protected habitats and species as defined in the Habitats Directive.
Species	A group of interbreeding organisms that seldom or never interbreed with individuals in other such groups, under natural conditions; most species are made up of subspecies or populations.
The Applicant	Sure Partners Ltd.
Zone of Influence (ZoI)	Spatial extent of potential impacts resulting from a project or activity.

Acronyms

Abbreviation	Term
ABWP1	Arklow Bank Wind Park 1
ABWP2	Arklow Bank Wind Park 2
ADD	Acoustic Deterrent Device
C	Central
CI	Confidence Interval
CPT	Cone Penetration Test
CSIP	Cetacean Strandings Investigation Programme
CV	Coefficient of Variation
DAHG	Department of Arts, Heritage, and the Gaeltacht
DAS	Digital Aerial Survey
dB	decibel (sound pressure)
DHLGH	Department of Housing, Local Government and Heritage
EDR	Effective Deterrence Range
EEZ	Economic Exclusion Zone
EIAR	Environmental Impact Assessment Report
EMF	Electro-Magnetic Fields
EMP	Environmental Management Plan
EPA	Environment Protection Agency
EU	European Union
FCS	Favourable Conservation Status
FHG	Functional Hearing Group
HF	high frequency

Abbreviation	Term
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
Hz	hertz (frequency)
IAMMWG	Inter-Agency Marine Mammal Working Group
IUCN	International Union for Conservation of Nature
IWDG	Irish Whale and Dolphin Group
JNCC	Joint Nature Conservation Committee
kHz	kilohertz (frequency)
km	kilometre (distance)
km^2	kilometre squared (area)
LF	low frequency
m	metre (distance)
MARA	Maritime Area Regulatory Authority
MARPOL	International Convention for the Prevention of Pollution from Ships
MBES	multibeam echosounder
MMMP	Marine Mammal Mitigation Plan
MMMZ	marine mammal mitigation zone
MMO	Marine Mammal Observer
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
MU	management unit
MW	Megawatt
NBDC	National Biodiversity Data Centre

Abbreviation	Term
NMFS	National Marine Fisheries Service
N-OSP	North Offshore Substation Platform
NPWS	National Parks and Wildlife Service
NW	Northwest
O&M	Operational and Maintenance
OSP	Offshore Substation Platform
OWF	Offshore Wind Farm
PAM	Passive Acoustic Monitoring
PCW	Phocid Carnivore in water
PTS	Permanent Threshold Shift
RFI	Request for Further Information
rms	Root mean squared
RoI	Republic of Ireland
SAC	Special Area of Conservation
SBP	Sub-bottom Profiler
SCANS	Small Cetaceans in European Atlantic waters and the North Sea
SEL	Sound Exposure Level
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Body
S-OSP	South Offshore Substation Platform
SPL	Sound Pressure Level
SSS	Side Scan Sonar
SW	Southwest

Abbreviation	Term
TTS	Temporary Threshold Shift
UHRS	Ultra-High Resolution Seismic
UK	United Kingdom
US	United States (of America)
UXO	unexploded ordnance
VHF	very high frequency
VMP	Vessel Management Plan
WTG	Wind Turbine Generator
ZoI	Zone of Influence

1 Introduction

1.1 Overview

1.1.1.1 All species listed under the Annex IV of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (as amended) (hereafter "the Habitats Directive"), which covers animal and plant species of community interest in need of strict protection. The Habitats Directive has been transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended (hereafter referred to as "the Habitat Regulations").

1.1.1.2 Under Regulation 51(2) of the Habitats Regulations, it is an offence, except in accordance with a derogation licence granted by the Minister under Regulation 54, to:

a) *Deliberately capture or kill any specimen of these species in the wild;*
b) *Deliberately disturb these species particularly during the period of breeding, rearing, hibernation and migration;*
c) *Deliberately take or destroy eggs of those species from the wild;*
d) *Damage, or destruction of a breeding site or resting place of such an animal; or*
e) *Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken from the wild, other than those taken legally in accordance with Article 12(2) of the Habitats Directive.*

1.1.1.3 These are referred to collectively as 'Regulation 51 Impacts' herein. Under Regulation 54 any person may apply to the Minister for the Department of Housing, Local Government and Heritage (DHLGH) for a derogation licence from complying with the requirements of the provisions of Regulation 51.

1.1.1.4 This document has been prepared to determine whether there is a need for a derogation licence in respect of potential Regulation 51 Impacts on Annex IV species arising as a result of Arklow Bank Wind Park 2. Where a requirement for a derogation licence has been identified, information to support the licence application has been evidenced herein (i.e. to demonstrate that the criteria for the grant of such a licence set out in Regulation 54 have been met).

1.1.1.5 This document has been prepared in accordance with the requirements listed in Section 2.3 including guidance from the National Parks and Wildlife Service (NPWS) and European Commission. Specifically, this document has been structured in accordance with the requirements of Part E of the Application Form (NPWS, 2025a).

1.2 Objective of the Proposed Works

1.2.1 Context of the Proposed Development

1.2.1.1 Arklow Bank Wind Park 2 (ABWP2), hereafter referred to as the "Proposed Development", is a proposed offshore wind farm (OWF) situated on and around Arklow Bank in the Irish Sea off the coast of Ireland, approximately 6-15 km to the east of Arklow in County (Co.) Wicklow (Figure 1). The total footprint of the Proposed Development is 139.4 km^2 and is contained entirely within Ireland's National Marine Planning Framework Area and Irish Exclusive Economic Zone (EEZ). Further details of the Proposed Development are provided in Annex A of this document (which comprises Chapter 4 of the Environmental Impact Assessment Report [EIAR] for the Proposed Development).

1.2.1.2 The offshore infrastructure of the Proposed Development comprises two main spatial components (as illustrated in Figure 1):

- Array Area: Hosts the primary wind farm infrastructure, including wind turbine generators (WTGs), offshore substations (OSPs), and associated foundations, and cables. Cabling includes inter-array links between turbines, interconnectors between OSPs, and export cables to shore; and
- Cable Corridor and Working Area: Supports installation of export and interconnector cables and associated construction activities, including vessel movements, connecting the Array Area to landfall.

1.2.1.3 Consent has been sought for the Proposed Development to be constructed in accordance with one of two discrete Project Design Options. Each Project Design Option includes two OSPs and associated cabling systems and either 53 WTGs (Project Design Option 1) or 47 WTGs (Project Design Option 2). Both Project Design Options have been fully considered in this assessment.

1.2.1.4 The planning application for the Proposed Development was submitted to An Bord Pleanála, now known as An Coimisiún Pleanála (ACP) in June 2024 in accordance with Section 291 of the Planning and Development Act 2000, as amended. Subsequently, a Request for Further Information (RFI) was issued on 10th April 2025 in respect of the Section 291 Planning Application (under ACP Case Ref. 319864-24).

1.2.1.5 In providing the response to the matters raised in the RFI, a derogation licence application was submitted to the NPWS on 8th April 2026 and revised documentation was submitted to ACP on 10th April 2026. All documentation associated with the planning application is available via the case file and associated webpage (https://www.pleanala.ie/en-ie/case/319864) and via the planning application website (https://www.arklowbank2offshoreplanning.ie/rfi/). The response to the RFI is subject to an eight-week statutory consultation process (between 8th June – 29th July 2026) at the time of making this derogation licence application. On 22nd June 2026, the derogation licence from April 2026 was refused by the NPWS and this document supports a subsequent derogation licence application, submitted to the NPWS on 31st July 2026.

1.2.1.6 Whilst not part of the Proposed Development, it is noted that separately in May 2022, the Applicant received planning approval for onshore grid infrastructure (OGI) (Case Reference: 310090). In June 2022, the Developer received planning permission for the Operations and Maintenance Facility (OMF) (Planning Register Reference: 21/1316).

1.2.2 Objective of the Proposed Development

1.2.2.1 The objective of the Proposed Development is to deliver 800MW of offshore renewable energy to Ireland's grid by 2030. This represents an important contribution towards achieving the national targets in relation to reducing greenhouse gas emissions, particularly decarbonisation of the electricity sector.

1.2.2.2 The Proposed Development will contribute in a substantial and necessary way to Ireland's 2030 climate targets. Subject to planning permission, the Proposed Development will deliver 800MW of offshore renewable energy and is expected to begin exporting to the Irish grid from 2030. This represents a significant contribution to the Irish offshore wind sector to support both the 2030 Irish decarbonisation targets and commitments, as well as Ireland's energy security of supply.

1.2.2.3 The benefit of the Proposed Development in terms of its contribution to the decarbonisation of Irish energy to achieve a climate neutral economy, and helping to achieve the relevant obligations in relation to carbon, climate mitigation and specifically offshore renewables is important. There is a compelling and urgent need for renewable energy development in Ireland and Section 5.1 explains the scale of that need and why the important contribution that will be made by the Proposed Development should be given very substantial weight in decision making. The Proposed Development will represent a critical proportion of the State's renewable energy capacity, and will contribute to achieving Ireland's target of at least 5GW of offshore wind target by 2030 by producing approximately 800 MW of renewable energy annually.

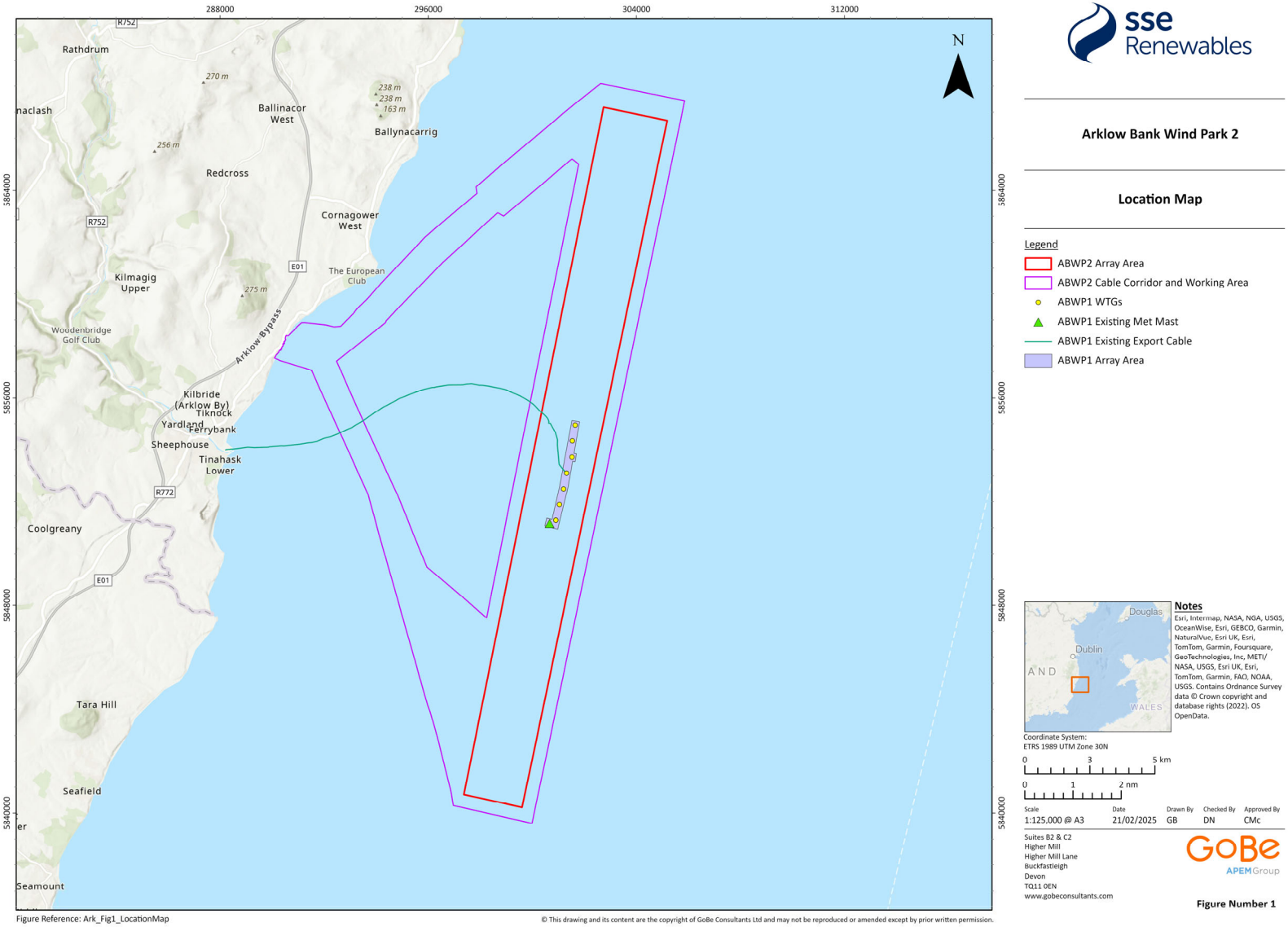

Figure 1: The Proposed Development

1.2.3 The Proposed Activities

1.2.3.1 As described in detail in Section 3, the Proposed Activities comprise the main types of works associated with the Proposed Development that may interact with the marine environment that have the potential for a Regulation 51 Impact to Annex IV species under the Habitats Regulations. Annex A of this document provides a detailed description of the Proposed Development, Annex B of this document provides a detailed description of each Proposed Activity with the layout and design illustrated in Figure 2 and Figure 3.

1.2.3.2 The objective of the Proposed Activities is to facilitate the construction, operation and maintenance and decommissioning of the Proposed Development, which would thereby support the objectives of the Proposed Development which have been described in Section 1.2.2.

1.2.3.3 Based on the screening and risk assessment presented in this document, it has been concluded that there is potential for deliberate disturbance on species of cetacean listed on Annex IV of the Habitats Directive from foundation installation associated with the Proposed Development. This conclusion is reached for foundation installation only, as there is a residual risk of deliberate disturbance from piling (in the form of TTS or behavioural responses) on those species, despite the application of mitigation measures that have been committed to.

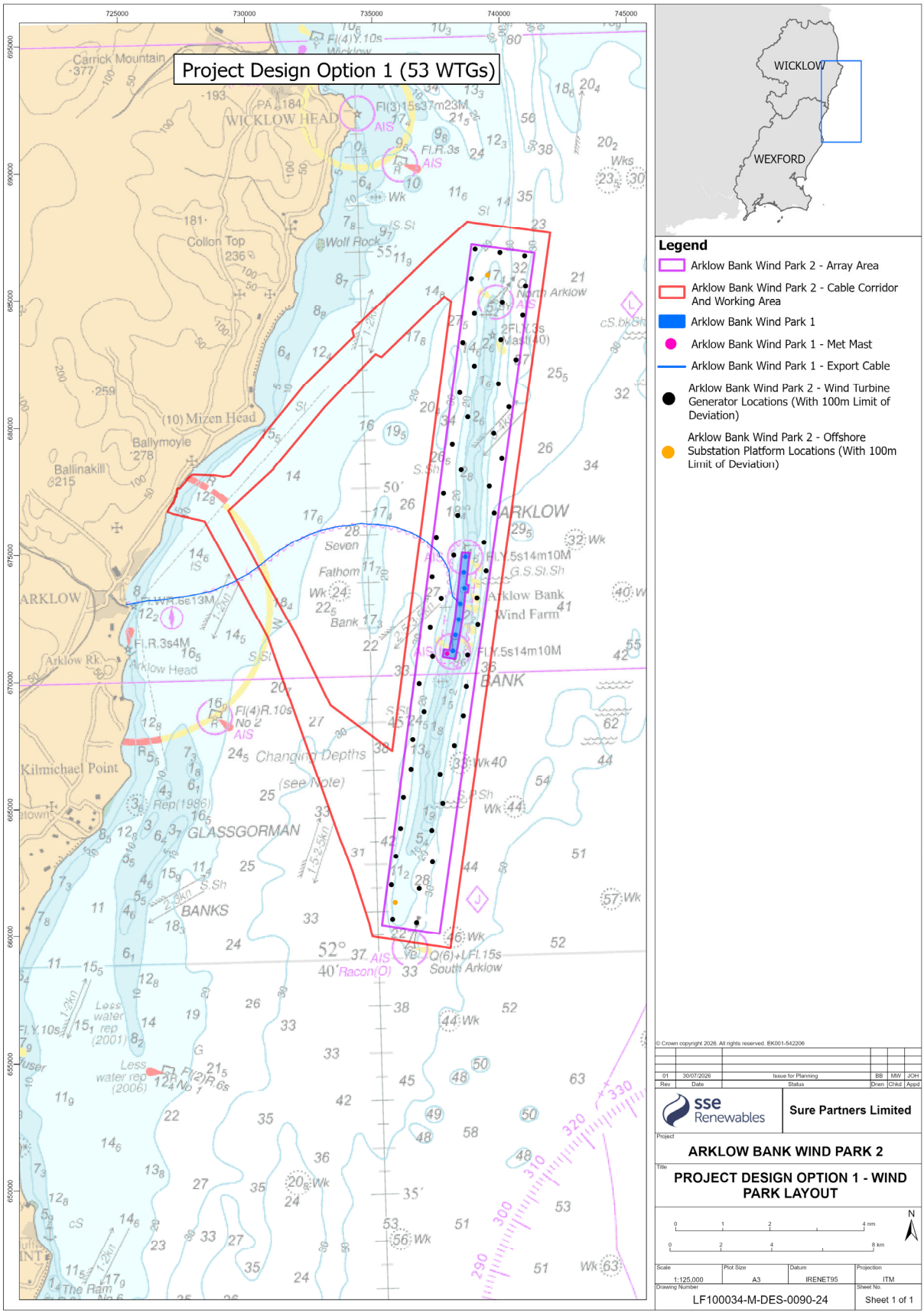

Figure 2: Location of Proposed Activities – Project Design Option 1

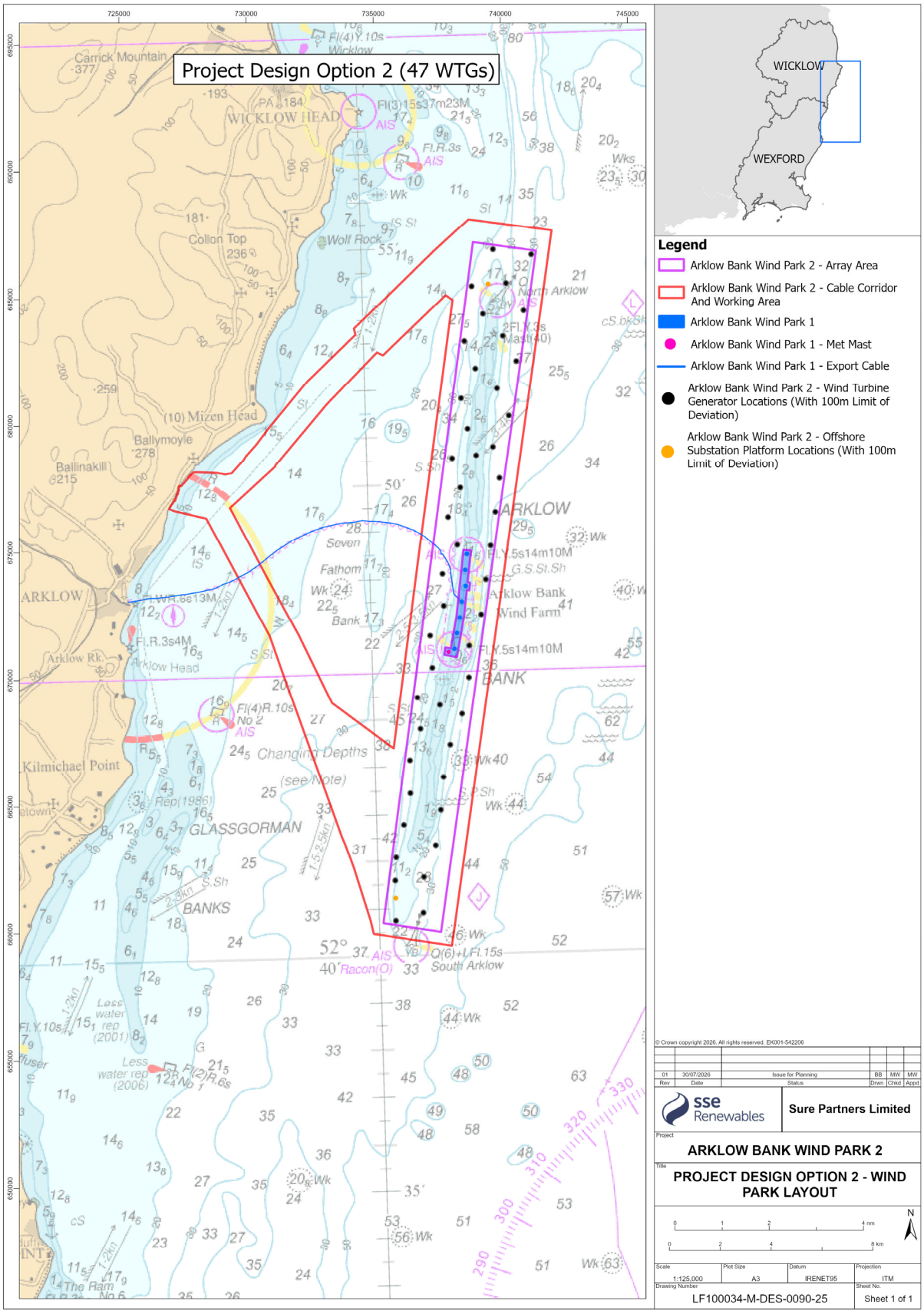

Figure 3: Location of Proposed Activities – Project Design Option 2

1.3 Contributing Experts

1.3.1 Details of the Applicant

1.3.1.1 The Applicant, Sure Partners Ltd, is a wholly owned subsidiary of the SSE Group under SSE Renewables, a leading developer and operator of renewable energy generation, focusing on onshore and offshore wind farms, hydro-electric power and flexible storage technologies. SSE Renewables is part of electricity infrastructure company SSE plc, a FTSE-100 company with operations across the UK and Ireland and a presence in carefully selected international markets. It delivers clean power assets to increase SSE's operational renewable generation capacity as part of the company's five-year investment plan to 2030. This includes delivery of the world's largest offshore wind farm in construction, the 3.6GW Dogger Bank Wind Farm, and progressing the company's 10GW pipeline of offshore wind projects including the 800MW Arklow Bank Wind Park 2. SSE Renewables also owns and operates 800 MW of onshore wind capacity from 32 sites across Ireland including the 174MW Galway Wind Park in Connemara and the 73MW Slieve Kirk Wind Park outside Derry City.

1.3.1.2 The derogation licence application has been prepared by the Applicant along with their consultants, GoBe Consultants Ltd/APEM on behalf of the Applicant. Those responsible for various aspects of the application are summarised in Table 1-1.

1.3.1.3 For all annexes to this document, statements of authority are included therein in relation to those authors that contributed to each report.

Table 1-1: Statement of Authority of those responsible for preparing this derogation licence application

Expert	Qualifications	Relevant Experience
Application Form		
Kaj Christiansen - SSE Renewables	Eng (Hons.) in Environmental Engineering from the University of Galway, MSc (Hons.) in Renewable Energy from University of Aberdeen, CEng BEng (Hons.) in Environmental Engineering from the University of Galway, MSc (Hons.) in Renewable Energy from University of Aberdeen, CEng with Engineers Ireland	Kaj has over 14 years' experience within the renewable energy industry, specifically in the field of offshore wind and solar energy development. Kaj has acted in both project engineering and project management roles for a number of offshore wind projects throughout the North Sea. Within these projects Kaj was responsible for delivering foundation structures and has experience across the project lifecycle; from procurement and design to construction and commissioning. North Sea. Kaj also has extensive Irish based development management experience in taking solar and offshore wind energy infrastructure through the development cycle; from early conceptual planning stages through to design, construction and operation.
Aoibhín Flanagan - SSE Renewables	BA(Mod) Environmental Science, Trinity College Dublin, MSc DIC Environmental Engineering and Business Management, Imperial College London. ISEP Practitioner.	Aoibhín is a Consents Manager with SPL/SSE and Practitioner and Committee Member with the Institute of Sustainability and Environmental Professionals (formerly IEMA). Aoibhín has 14 years' experience working in consenting, risk and environmental assessments across Europe and Australasia. Aoibhín has worked across a range of sectors and infrastructure types to manage and deliver consents and she has led spatial and data analysis, climate, health, social, population and socio-economic assessments and forecasting.
Supporting Report		
Kaj Christiansen	As per above	
Aoibhín Flanagan	As per above	
Ophelie Humphrey-Walsh	M.Sci. Marine Biology, University of Southampton.	Ophelie is a Principal Marine Mammal Consultant and technical co-lead of the marine mammal team at APEM. Ophelie joined APEM in 2024 having gained over 8 years of experience across Natural England and marine consultancy, bringing with her a wealth of experience of marine mammal technical reporting to support consents of marine industries in the UK. Since joining APEM Ophelie has worked on a range of projects in Ireland, providing document audit across EIA and HRA documentation.
Sarah Brouder - APEM	M.Sc. Water and Coastal Management, University of Bologna. M.Sc. Water and Coastal Management, University of Bologna. BSc. (Hons) Zoology, University College Cork.	Sarah is a Senior Marine Mammal Consultant at APEM with experience in environmental consultancy, marine mammal research and field work. Throughout her career, Sarah has worked on a number of marine mammal assessments for offshore projects across the Ireland and the UK, and has a practical understanding of legislation and policy governing marine mammals at a national and international level. Sarah has considerable experience collecting and interpreting baseline data, including from Passive Acoustic Monitoring (PAM), boat-based visual surveys and vantage point Sarah is a Senior Marine Mammal Consultant at APEM with experience in environmental consultancy, marine mammal research and field work.

1.3.2 Details of those responsible for the activity requiring derogation

1.3.2.1 The Applicant, its' Contractors and Subcontractors will have a responsibility to comply with the requirements of any licence(s) and permission(s) including any associated conditions that may be applied in addition to the requirements of the supporting documentation for those consents that may be granted for the Proposed Development, including any derogation licence pursuant to Regulation 54 of the Habitat Regulations.

1.3.2.2 The requirements detailed in Annex C of this document (which comprises the Environmental Management Plan for the Proposed Development) present various environmental commitments for the construction, operational and maintenance, and decommissioning phases of the Proposed Development. Further, a comprehensive Marine Mammal Monitoring Plan will be implemented throughout the piling campaign as outlined in Section 6 of Annex D of this document (which comprises the Marine Mammal Mitigation Plan for the Proposed Development).

1.3.2.3 The Applicant will appoint personnel with relevant expertise for their role and the activities. As documented in Section 2 of Annex C to this document, the key roles of relevance (i.e. that will be responsible for the activity requiring derogation), that will be appointed by the Applicant include:

- The Project Manager – The Project Manager for the construction, operational and maintenance and decommissioning phases of the Proposed Development will have overall responsibility for ensuring ongoing compliance with the EMP and all supporting documents, including the EIAR and the consents management plans. Their role is described in detail in Section 2.2.1 of Annex C of this document.
- The Environmental Manager – The Environmental Manager will be responsible for environmental management and compliance during all phases of the Proposed Development and be responsible for ensuring that all environmental responsibilities are fulfilled in accordance with legislative provisions as well as commitments made via consents and their supporting documentation. Their role is described in detail in Section 2.2.2 of Annex C of this document.
- The Environmental Clerk of Works (ECoW) – The ECoW will report to the Applicant's Environmental Manager and will work closely with all project personnel, including the Environmental Manager on matters relating to the environment and will alert them of any environmental issues arising. Their role is described in detail in Section 2.2.3 of Annex C of this document.
- Contractors and Subcontractors – The Applicant will oversee all work carried out by Contractor and Subcontractor staff. The Contractor and all Subcontractors will adhere to the requirements of the consents and employ an Environmental Manager with appropriate experience and expertise for the duration of the construction phase. Their role is described in detail in Section 2.3 of Annex C of this document.
- Supporting Environmental Roles – Relevant expertise will be employed to support particular roles in the construction, operation and maintenance and decommissioning of the Proposed Development. Supporting roles of relevance to the activity requiring derogation that have been committed to include the appointment of the following:
  - Marine Mammal Observer (MMO): As described in Section 2.4.2 of Annex C to this document, this is a qualified and experienced MMO that will be appointed to conduct visual monitoring for the presence of marine mammals in advance of and during certain activities.
  - Passive Acoustic Monitoring (PAM) Operator: As described in Section 2.4.3 of Annex C to this document, this is a dedicated and qualified PAM Operator that will be responsible for deployment, maintenance and operation of the PAM system; and
  - Acoustic Deterrent Device (ADD) Operator: As described in Section 2.4.4 of Annex C to this document, this is a dedicated and qualified ADD Operator that will be responsible for

deployment, maintenance and operation of the ADD including all verification and calibration.

- It is noted that the ADD operator can work a dual role as the MMO; however, the ADD and PAM operator cannot be the same person.

2 Background

2.1 Overview

2.1.1.1 This section provides the contextual information to this document to demonstrate the purpose of this document, relevant guidance as well as the existing information in relation to the Proposed Development. This section describes the legislative context for the derogation licence application and the legislative provisions in relation to the planning application that has been made for the Proposed Development.

2.2 Purpose of the Document

2.2.1.1 A number of activities will be required during the pre-construction, construction, operational and maintenance (O&M), and decommissioning phases of the Proposed Development. These "Proposed Activities", as described in Section 3 and further in Annex B of this document, could interact with cetacean species that may be present in the vicinity of the Proposed Development.

2.2.1.2 All species of cetacean are listed under the Annex IV of the Habitats Directive, which covers animal and plant species of community interest in need of strict protection. These species are protected wherever they occur throughout their natural range, including the waters of Ireland. The Habitats Directive has been transposed into Irish law by the Habitat Regulations.

2.2.1.3 Under Regulation 51(2) of the Habitats Regulations, it is an offence, except in accordance with a derogation licence granted by the Minister under Regulation 54, to:

a) Deliberately capture or kill any specimen of these species in the wild;
– Deliberately disturb these species particularly during the period of breeding, rearing, hibernation and migration;
b) Deliberately take or destroy eggs of those species from the wild;
c) Damage, or destruction of a breeding site or resting place of such an animal; or
– Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken from the wild, other than those taken legally in accordance with Article 12(2) of the Habitats Directive.

2.2.1.4 These are referred to collectively as 'Regulation 51 Impacts' throughout this assessment.

2.2.1.5 Under Regulation 54 any person may apply to the Minister for the Department of Housing, Local Government and Heritage (DHLGH) for a derogation licence from complying with the requirements of the provisions of Regulation 51.

2.2.1.6 The purpose of the Annex IV Risk Assessment presented in Section 3.3, is to determine whether there is a need for a derogation licence in respect of potential Regulation 51 Impacts on Annex IV species arising as a result of the Proposed Development. Where a requirement for a derogation licence has been identified, information to demonstrate that the criteria for the grant of such a licence set out in Regulation 54 have been met and evidenced, with the relevant information presented in Section 5 of this document.

2.3 Relevant Guidance

2.3.1.1 This report has been produced in accordance with the following relevant guidance:

- European Union (EU) Commission Guidance on the Strict Protection of Animal Species of Community Interest under the Habitats Directive (European Commission, 2021);
- Guidance on the strict protection of certain animal species under the Habitats Directive in Ireland (National Park and Wildlife Service (NPWS), 2021);

- Applications for Regulation 54 Derogations for Annex IV species: Guidance for Applicants (NPWS, 2026);
- Guidance to manage the risk to marine mammals from man-made sound sources in Irish Waters (Department of Arts, Heritage, and the Gaeltacht (DAHG); 2014); and
- EU Commission's Guidance document on clarification of the concepts of: Alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence (European Commission 2007a).

2.3.1.2 The DAHG guidance (2014) has been used to inform the risk assessment of anthropogenic acoustic impacts on relevant cetacean species presented in this report. The guidance has been used to identify sound sources which may be introduced into the marine environment by specific human activities and which may give rise to detrimental impacts on protected marine mammal populations or individuals. It has also been used to give a structured approach to the assessment of risk and informed decision making with respect to those activities. The DAHG (2014) guidance specifies the need to consider the likely impact of a project, and whether the project is likely to have a significant effect on a species, hence this risk assessment has drawn upon Annex E of this document (which comprises Chapter 11 of the EIAR for the Proposed Development, where marine mammals have been assessed) and Annex F of this document (the Natura Impact Statement for the Proposed Development). The DAHG (2014) guidance has also been used to inform the identification of practical measures to avoid, prevent and/or reduce risk which must be considered to minimise the potential effects of sound sources on the natural ecology of marine mammal species. The mitigation measures committed to by the Applicant have been included within Annex D of this document. This risk assessment evaluates whether residual effects from acoustic impacts remain after the application of the committed mitigation measures, and whether any further measures are required to avoid impacts prohibited under Regulation 51.

2.3.1.3 The European Commission (2021) guidance provides the following detail on the interpretation of 'deliberate killing'. In section (2-34), it states the following: *"On the basis of the approach taken by the Court in cases C-103/00 and C-221/04, 'deliberate' actions are to be understood as actions carried out by a person who is aware that these actions will lead to capturing or killing a species listed in Annex IV, or consciously accepts the possibility of such an offence. the provision applies not only to a person who fully intends to capture or kill a specimen of a protected species but also to a person who is sufficiently informed and aware of the consequences his or her action will most likely have and nevertheless still performs the action, which leads to the capturing or killing of specimens".* This guidance on deliberate killing has been used in this assessment. To note, this meaning of 'deliberate' has also been used in the context of 'deliberate disturbance', as per the guidance which says in section (2-41): *"The disturbance also has to be 'deliberate' in order to fall within the scope of Article 12(1)(b)".*

2.3.1.4 The European Commission (2021) guidance also highlights that *"Neither Article 12 nor Article 1 of the Habitats Directive contains a definition of the term 'disturbance'"*. The guidance provides the following text on defining deliberate disturbance: *"It is clear that any activity that deliberately disturbs a species to the extent that it may affect its chances of survival, breeding success or reproductive ability, or leads to a reduction in the occupied area or the relocation or displacement of the species, should be regarded as a 'disturbance' under the terms of Article 12."* This clarification on what constitutes "deliberate disturbance" has been used in this assessment.

2.3.1.5 The Applicant considers that injury to a marine mammal can also affect its chances of survival, breeding success or reproductive ability. Accordingly, the Applicant has considered injury under the umbrella of disturbance and assessed the potential for injury alongside other forms of disturbance (e.g. behavioural responses).

2.4 Existing Information

2.4.1.1 The protection of habitats and species afforded by the Habitats Directive has been considered by the Applicant throughout design development and evolution of the Proposed Development. Environmental considerations, including protected species listed in Annex IV of the Habitats Directive have been central to the decision-making process with efforts to ensure the avoidance, prevention, reduction, or offsetting of adverse environmental effects, including potential Regulation 51 Impacts.

2.4.1.2 As noted in Section 1.2, this derogation licence application coincides with the ongoing statutory consultation on the RFI response that was submitted to ACP. It is noted that there is a range of existing studies and supporting information in relation to the Proposed Development as listed in Table 2-1 which is of relevance to this application. Whilst this documentation is publicly available, based on the request of the NPWS, the relevant documentation has been included as annexes herein where it has been relied upon for the purpose of undertaking the risk assessment and/or demonstrating evidence to support conclusions reached.

Table 2-1: Documentation from the planning application of relevance to this application

Annex to this application	Document name	Planning application reference	Weblink
Annex A	EIAR Volume II – Chapter 4: Description of Development (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_04_description_of_development_revised_march_2026.pdf
Annex B	Proposed activities screened into the Annex IV Risk Assessment	n/a – prepared to support this report	
Annex C	EIAR Volume III - Appendix 25.1: Environmental Management Plan (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_25_1_environmental_management_plan_revised_march_2026.pdf
Annex D	EIAR Volume III - Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_25_2_marine_mammal_mitigation_plan_revised_march_2026.pdf
Annex E	EIAR Volume II - Chapter 11: Marine Mammals (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_11_marine_mammals_revised_march_2026.pdf
Annex F	NIS Volume II – Stage 2 AA; Natura Impact Statement (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, NIS.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-ii/abwp2_natura_impact_statement_revised_march_2026.pdf

Annex G	Baseline Characterisation of Annex IV species.	n/a – prepared to support this report	
Annex H	EIAR Volume III - Appendix 11.2: Marine Mammals Technical Report (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-iii/abwp2_11_2_marine_mammals_technical_report_revised_march_2026.pdf
Annex I	EIAR Volume III - Appendix 25.7: Vessel Management Plan	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-25.7-vessel-management-plan.pdf
Annex J	EIAR Volume III - Appendix 25.10: Environmental Vessel Management Plan	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-25.10-environmental-vessel-management-plan.pdf
Annex K	EIAR Volume III – Appendix 11.1: Underwater Noise Assessment (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-iii/abwp2_11_1_underwater_noise_assessment_revised_march_2026.pdf
Annex L	EIAR Volume III - Appendix 11.3: Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-11.3-phase-1-offshore-wind-farms-cumulative-ipcod-modelling.pdf
Annex M	EIAR Volume II - Chapter 2: Policy and Legislation (Revised March 2026).	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_02_policy_and_legislation_revised_march_2026.pdf
Annex N	EIAR Volume II - Chapter 3: Consideration of Alternatives (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_03_consideration_of_alternatives_revised_march_2026.pdf
Annex O	Noise Mitigation Systems and Strategies – A Targeted Literature Review.	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, RFI Response Annex 5	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/applicant-response-to-the-request-for-further-information/abwp2_applicant_response_to_further_information_rfi_march_2026.pdf
Annex P	EIAR Volume III - Appendix 15.2: Safety Justification (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_15_2_shipping_a

		nd_navigation_safety_justification_rfi_march_2026.pdf
Annex Q	Dogger Bank C: Marine Mammal Compliance Report (Turbines)	n/a – Prepared for Dogger Bank C
Annex R	Dogger Bank C: Marine Mammal Compliance Report (Offshore Substation Platform	n/a – Prepared for Dogger Bank C
Annex S	Underwater Noise Assessment Approach	n/a – prepared to support this report

3 The Proposed Activity

3.1 Overview

3.1.1.1 The Proposed Activities comprise the main types of works during the Proposed Development that may interact with the marine environment. The Proposed Activities are presented in Table 3-2, alongside the equipment that may be used or the nature of the works. The indicative timing and duration of these Proposed Activities are based on the construction programme presented in Annex A of this document, with operational activities occurring subsequently over the lifetime of the Proposed Development.

3.1.1.2 Table A in Annex B of this document provides a detailed description of each Proposed Activity. A complete list and detailed description of all activities associated with the Proposed Development, including the Proposed Activities, is available to view in Annex A of this document.

3.2 Screening of Proposed Activities

3.2.1.1 An initial, screening analysis has been undertaken in Table 3-2 to determine the potential for a Regulation 51 Impact to Annex IV species under the Habitats Regulations. The outcome of this screening evaluation informs which activities are carried forward into the detailed Annex IV risk assessment, and which activities can be screened out at this stage.

3.2.1.2 It has been determined that there is no plausible pathway of a Regulation 51 Impact under parts (c) to (e) and no risk of 'deliberate capture' under part (a) of Regulation 51(2) of the Habitats Regulations for all of the Proposed Activities.

Table 3-1: Justification for no pathway for some Regulation 51 Impacts to occur (parts a, c, d and e)

Regulation 51 Impact	Justification
(a) Deliberately capture or kill any specimen of these species in the wild;	The Proposed Activities do not involve any action intended to trap, handle, or pursue Annex IV species, nor do they create conditions in which capture could reasonably occur. Annex IV cetacean species present in the area are highly mobile and capable of avoiding vessels and equipment, and the nature of the works does not generate confined spaces, entrapment zones, or structures that could result in capture. Consequently, there is no plausible pathway for deliberate capture to occur. Accordingly there is no pathway for these impacts to arise, and therefore no requirement for a derogation licence on this basis.
(c) Deliberately take or destroy eggs of those species from the wild;	The Annex IV cetacean species present in the area and considered to be at risk from the Proposed Activities do not produce eggs, and accordingly there is no pathway for this impact to arise, and therefore no requirement for a derogation licence on this basis.
(d) Damage, or destruction of a breeding site or resting place of such an animal; or	The Proposed Activities will not destroy or damage a breeding site or resting place of an Annex IV species. There is an absence of information on the breeding site and resting places of cetaceans, therefore it is assumed that breeding and resting may occur wherever the species occur. As such, the presence of breeding site or resting places within the vicinity of the Proposed Development cannot be excluded. The breeding site or resting place of cetaceans comprise the water column within which they reside. The Proposed Activities will not physically destroy or damage any elements of the water column, in that the water column will remain intact and able to support cetaceans in their breeding and resting behaviours.

		Accordingly, there is no pathway for this impact to arise, and therefore no requirement for a derogation licence on this basis.
	(e) Keep, transport, sell, exchange, offer for sale or offer for exchange any specimen of these species taken from the wild, other than those taken legally in accordance with Article 12(2) of the Habitats Directive.	The Proposed Activities will not involve keeping, transport, sale, exchange or trade of specimens. Accordingly, there is no pathway for this impact to arise, and therefore no requirement for a derogation licence on this basis.

3.2.1.3 There is the potential for the Proposed Activities to give rise to mortality and disturbance, prohibited under parts (a) and (b) of the Habitats Regulations, which required further consideration and thus have been screened into the assessment.

Table 3-2: Description of the Proposed Activities and the potential for a Regulation 51 Impact to occur.

Project phase	Proposed Activities	Equipment used and/or nature of the works	Potential for a Regulation 51 Impact				
			(a)	(b)	(c)	(d)	(e)
Pre-construction and Construction	Confirmatory surveys (Geophysical)	Multibeam echosounder (MBES), side scan sonar (SSS), magnetometer, sub-bottom profiler (SBP), seismic refraction/reflection (2D/3D ultra-high resolution seismic (UHRS)) and ultra-short baseline (USBL) acoustic positioning system.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Confirmatory surveys (Geotechnical)	Boreholes, cone penetration test (CPT), vibrocore, and grab samples.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Other pre-construction surveys	Metocean, environmental, corrosion, sediment dynamics, post installation/as built remotely operated vehicle (ROV) surveys.	No[a]	No[b]	No[c]	No[d]	No[e]
	Foundation installation	Monopile installation of WTG and OSPs using piling, drilling, and drive-drill-drive techniques.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Dredging, trenching and cable installation	Seabed lowering and feature clearance, trenching for cable installation and reburial, scour protection works, and cable crossing.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Infrastructure preparation and installation activities	Seabed preparation, cable protection, scour protection, grouting, cable crossing.	No[a]	No[b]	No[c]	No[d]	No[e]
	Vessels	Use of jack up vessels, dynamically positioned vessels, heavy lift vessels, support vessels, survey operation vessels and daughter craft, cable repair vessels, excavators, rock dumpers or dredger, guard vessels, crew transfer vessels, helicopters	Yes[a]	Yes[b]	No[c]	No[d]	No[e]
	Surveys	Geophysical, metocean, environmental, corrosion, sediment dynamics, post	No[a]	Yes[b]	No[c]	No[d]	No[e]

Project phase	Proposed Activities	Equipment used and/or nature of the works	Potential for a Regulation 51 Impact				
			(a)	(b)	(c)	(d)	(e)
Operation and Maintenance (O&M)		installation inspections using surveys vessel(s) or unmanned surface vehicles.					
	Infrastructure maintenance and repairs	Routine inspections, repairs and replacements of navigation equipment, removal of marine growth and guano, replacement of corrosion protection anodes, painting, replacement or modifications of ancillary structures and J-tubes, and scour protection maintenance.	No[a]	No[b]	No[c]	No[d]	No[e]
	Maintenance dredging, and cable works	Scour protection repair, foundation and cable maintenance, and cable reburial.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Vessels	Use of jack up vessels, dynamically positioned vessels, survey operation vessels and daughter craft, cable repair vessels, excavators, rock dumpers or dredger, guard vessels, crew transfer vessels, helicopters	Yes[a]	Yes[b]	No[c]	No[d]	No[e]
	Operational turbines	Rotation of WTG blades during the operational lifetime.	No[a]	No[b]	No[c]	No[d]	No[e]
Decommissioning	Foundation and OSPs	Removal of WTG and OSP monopile foundations (cut 2 m below seabed level), dismantling and removal of WTG components and OSP topsides.	No[a]	Yes[b]	No[c]	No[d]	No[e]
	Cables	Scour protection, inter-array, interconnector, and offshore export cables with cable protection to be left *in situ.*	No[a]	No[b]	No[c]	No[d]	No[e]
	Vessels	Assumed similar to that of construction, including jack up vessels, dynamically positioned vessels, heavy lift vessels, support vessels, survey operation vessels and daughter craft, cable repair vessels,	Yes[a]	Yes[b]	No[c]	No[d]	No[e]

Project phase	Proposed Activities	Equipment used and/or nature of the works	Potential for a Regulation 51 Impact				
			(a)	(b)	(c)	(d)	(e)
		excavators, rock dumpers or dredger, guard vessels, crew transfer vessels, helicopters					
N/A	Unexploded ordnance (UXO) Clearance	Clearance of UXO, if required, including use of vessels and appropriate seabed operations.	No[9f)]	No[9f)]	No[9f)]	No[9f)]	No[9f)]

No[(a)]: The Proposed Activity does not introduce noise at a level or vessels that could lead to mortality in cetaceans, therefore no pathway for this impact exists.

Yes[(a)]: The Proposed Activity may result in mortality of cetaceans through very high levels of underwater noise or collision with vessels; therefore a pathway for this impact exists and requires further assessment.

No[(b)]: The Proposed Activity does not introduce noise or the presence of infrastructure that could disturb cetaceans, therefore no pathway for this impact exists.

Yes[(b)]: The Proposed Activity may introduce noise, vessel presence, accidental pollution or EMF that could disturb cetaceans in the vicinity of the activity. Therefore, a pathway for this impact exists and requires further assessment.

No[(c)]: The relevant cetacean species do not lay eggs so there is no possibility of taking or destruction of eggs, therefore no pathway for this impact exists.

No[(d)]: The Proposed Activities will not damage or alter the water column in any way that would affect its ability to support a breeding site or resting place of cetaceans, therefore no pathway for this impact exists.

No[(e)]: The Proposed Activities will not involve the keeping, transport, sale, exchange, or trade of specimens, therefore no pathway for this impact exists.

No[9f)]. UXO clearance is not required at this time on the basis of current knowledge, therefore no pathway for this impact exists.

3.2.1.4 Further analysis has been undertaken of the pathways from the Proposed Activities that could lead to an impact under Regulation 51(2)(a) and (b). The analysis has been informed by Annex E to this document, which identified direct and indirect effects from the Proposed Activities that have potential to lead to a mortality or disturbance effect on marine mammals in accordance with the EIA Directive and Annex F which identified effects on European sites, their Conservation Objectives and Qualifying Interests in accordance with the requirements of the Habitats Directive).

3.2.1.5 The risk of killing an Annex IV species can arise through vessel collision or accidental pollution associated with vessel activity. There is no risk of killing an Annex IV species through a change in electromagnetic fields. Furthermore, most noise sources associated with the Proposed Activities produce noise at levels below those that can lead to death. The risk of death from noise sources is limited to very loud noise sources consisting of explosions (JNCC, 2025a) and some sonar systems. Therefore, only the noise from UXO clearance can lead to a risk of killing an Annex IV species and that is not required for the Proposed Development on the basis of current knowledge.

3.2.1.6 The risk of disturbance to an Annex IV species can occur from several Proposed Activities and associated impact pathways. The main pathway for disturbance is from anthropogenic underwater noise. For the purpose of this risk assessment, disturbance has been interpreted as covering several impact pathways from underwater noise: permanent threshold shift (PTS) (also referred to as auditory injury), temporary threshold shift (TTS), and behavioural disturbance. Disturbance may also arise from Proposed Activities which do not produce noise, for example through EMF and accidental pollution.

3.3 Risk Assessment

3.3.1 Annex IV Species

3.3.1.1 All species of cetacean are Annex IV species and are afforded strict protection under the Habitats Directive and transposing Habitats Regulations. These species have therefore been considered within this Annex IV Risk Assessment where they may occur within the vicinity of the Proposed Development and have the potential to interact with the Proposed Activities.

3.3.1.2 A detailed environmental baseline characterisation of the relevant Annex IV cetacean species (including their distribution, occurrence, and ecological context provided by established data sources) is provided in Annex G of this document whilst Annex H of this document describes the baseline characterisation of the marine mammal ecology. The key information relevant to this assessment is summarised below.

3.3.1.3 Twenty-five species of cetacean have been recorded in Irish waters (Berrow *et al.*, 2010; Irish Whale and Dolphin Group (IWDG), 2025; National Biodiversity Data Centre (NBDC) 2023; Rogan *et al.,* 2018). However, the cetacean species that may be at plausible risk of disturbance or mortality are those identified as commonly recorded within the vicinity of the Proposed Development based on the comprehensive desk-based review and site-specific survey data presented in Annex G and Annex H of this document. These are harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*), short-beaked common dolphin (*Delphinus delphis*; hereafter referred to as common dolphin), Risso's dolphin (*Grampus griseus*) and minke whale (*Balaenoptera acutorostrata*).

3.3.1.4 These five species may be present in the vicinity of the Proposed Activities and therefore may be exposed to Regulation 51 impacts from the Proposed Activities. All five species may use the area around the Proposed Development for migration or their natural movements. It is assumed that all species may use the area for breeding or rearing, with the exception of minke whale which do not breed in Irish waters.

3.3.2 Consideration of Deliberate Action

3.3.2.1 Where potential impacts on Annex IV species could affect Favourable Conservation Status (FCS), the interpretation of 'deliberate' under part (b) of Regulation 51 of the Habitats Regulations is considered in light of relevant case law and guidance.

3.3.2.2 This includes the consideration of the Court of Justice of the European Union (CJEU) cases C-103/00 and C-221/04, which clarifies the meaning of 'deliberate' in relation to capture, killing, or disturbance of strictly protected species. The European Commission guidance considers this caselaw and advises that *"'deliberate' actions are to be understood as actions by a person or body who knows that their action will most likely lead to an offence against a species, but intends this offence or, at least, consciously accepts the foreseeable results of his action"* (European Commission, 2021).

3.3.2.3 In respect of renewable energy projects such as the Proposed Development, the European Commission advises that *"It is important to stress reliance on derogations may not be needed in the first place. The incidental killing or disturbance of individual specimens is not an obstacle to the development of renewable energy projects whenever such projects integrate mitigation measures to effectively prevent as much as possible killing or disturbance. Therefore, in these cases the incidental killing or disturbance of individual specimens of protected species should not be considered deliberate and hence would not fall under Article 12(1) of the Habitats Directive"* (European Commission, 2022).

3.3.2.4 This is established under EU Directive 2023/2413 for the promotion of energy from renewable sources (hereafter referred to as RED III). REDIII states in Article 16b(2) that "*Where a renewable energy project has adopted necessary mitigation measures, any killing or disturbance of the species protected under Article 12(1) of Directive 92/43/EEC and Article 5 of Directive 2009/147/EC shall not be considered to be deliberate.*"

3.3.2.5 The Applicant has committed to a number of designed-in measures and management measures (or controls) which have been factored into the Proposed Development. These 'mitigation measures are outlined in Table 11.15 of in Annex E of this document, and apply across the Proposed Development. The key measures committed to by the Applicant that are relevant to this assessment is the implementation of a Marine Mammal Mitigation Plan which is included in Annex D of this document, the Vessel Management Plan (VMP) provided in Annex I, the Environmental VMP provided in Annex J and the EMP provided in Annex C of this document.

3.3.3 Assessment of Deliberate Killing of any Specimen

VESSEL COLLISION

3.3.3.1 Vessel strikes are a known cause of mortality in marine mammals, either through instant death or secondary to injuries caused (Laist *et al.*, 2001). However, there is currently a lack of information on the frequency of occurrence of vessel collisions with marine mammals in RoI waters, and there is little evidence from marine mammals stranded in Ireland to suggest that vessel collisions is an important cause of marine mammal mortality. In the UK, the Cetacean Strandings Investigation Programme (CSIP) documents the annual number of reported strandings and the cause of death for those individuals examined at post-mortem. Data provided by CSIP suggests that very few strandings have been attributed to vessel collisions, therefore, while there is evidence that mortality from vessel collisions can and does occur, it is not considered to be a significant cause of death to cetaceans in RoI and UK waters.

3.3.3.2 Whilst a broad range of vessel types have been involved in collisions with marine mammals (Laist *et al.*, 2001), larger vessels travelling at 7 ms^{-1} or faster are those most likely to cause death or serious injury to marine mammals (Laist *et al.*, 2001). The majority of vessels used during the

Proposed Activities are likely to be large vessels that will either be travelling considerably slower than 7ms^{-1} or will be stationary for significant periods of time. Similarly, during the O&M phase a proportion of these vessels will be stationary or slow moving throughout O&M activities for significant periods of time. Therefore, the actual increase in vessel traffic moving within the Proposed Development and to/from port will occur over short periods of time. Smaller vessels (i.e. tug/anchor handlers, guard vessels, survey vessels, and crew transfer vessels) may travel at higher speeds, however they are able to move to avoid marine mammals (when detected), due to better manoeuvrability compared to larger vessels (Schoeman *et al.*, 2020).

3.3.3.3 In addition, mitigation measures which the Applicant has committed to implementing and which are described in detail in Annex D to this document as well as the Vessel Management Plan (VMP) and Environmental VMP (Annex I and Annex J of this document), will ensure that vessel traffic will move along predictable routes, which is known to be a key aspect in minimising the potential risks imposed by vessel traffic (Lusseau, 2003; 2006; Nowacek *et al.*, 2001). The VMP also sets out a Code of Conduct to minimise interactions with marine mammals and define how vessels should behave in the presence of them. It is also likely that the noise emissions from vessels involved in the Proposed Activities will deter animals from the immediate vicinity of the vessel where collision could occur.

3.3.3.4 Consequently, it is not expected that the vessel increase associated with the Proposed Activities will increase the risk of mortality due to vessel collision. Notwithstanding taking a precautionary approach, the killing of marine mammals is not a foreseeable event or an expected consequence from the use of vessels for the Proposed Development. Therefore, there is no risk of deliberate killing of any specimen of Annex IV cetacean species in the wild, and a derogation licence is not required.

ACCIDENTAL POLLUTION

3.3.3.5 Cetaceans can be affected by pollution or marine litter that can lead to death of individuals (Helm *et al.,* 2015). There is the potential for an accidental release of pollutants to occur from vessels and equipment associated with the Proposed Development, which could have the potential to result in mortality to cetaceans. Pollutants may include diesel fuel, bentonite (from drilling activities), lubricants, grease and oils and anti-fouling biocides.

3.3.3.6 All vessels undertaking Proposed Activities will adhere to MARPOL (International Convention for the Prevention of Pollution from Ships) requirements, which provide an international standard for the safe management and operation of ships for pollution prevention as detailed Section 11.7.3 and Table 11.15 in Annex E of this document. This will ensure adoption of routine measures and standard best practice in terms of waste management, auditing, pollution prevention measures and implementation of a dropped object protocol. Oil and fuel shall be stored securely in bunded containers. Chemicals will be stored securely, and good housekeeping practices as listed in Section 11.7.3 and Table 11.15 in Annex E of this document will be adhered to always. In addition, the EMP provided in Annex C of this document includes measures and commitments made within the EIAR and a Marine Pollution Contingency Plan (MPCP). The mitigation measures will include storage of chemicals in secure designated areas on vessels in line with appropriate regulations and guidelines, and double skinning of any tanks and pipes containing hazardous substances. All chemicals used will be subject to a chemical risk assessment to ensure risks are understood and minimised. The EMP will also include a MPCP which will contain key emergency contact details and response procedures in the event of a spill to ensure minimal impact. Following these procedures will also reduce the magnitude of any spill. Adherence to the mitigation measures, including the EMP and MPCP, and good working practices will significantly reduce the likelihood of an accidental pollution incident occurring, and the magnitude of its impact.

3.3.3.7 Consequently, it is not expected that an accidental pollution event from the Proposed Activities will occur. If an accidental pollution event does occur, the magnitude of the impact will be limited

through the implementation of effective management measures. Notwithstanding taking a precautionary approach, the killing of marine mammals is not a foreseeable event or an expected consequence from accidental pollution from the use of vessels or equipment for the Proposed Development. Therefore, there is no risk of deliberate killing of any specimen of Annex IV cetacean species in the wild, and a derogation licence is not required.

3.3.4 Assessment of Deliberate Disturbance to these species

CHANGES IN ELECTROMAGNETIC FIELDS

3.3.4.1 The conduction of electricity through subsea power cables has the potential to emit a localised electromagnetic field (EMF) which could potentially affect the sensory mechanisms of marine mammal species (CMACS, 2003; Copping, 2018; Normandeau *et al.*, 2011). The effects of EMF on marine mammals are not well understood and, more broadly, there has been a lack of studies investigating the effects of EMF on the behaviour of magneto- and electrosensitive animals. There is evidence to suggest that some species of cetacean may be able to detect variations in magnetic fields, therefore it is plausible that they are magneto-sensitive (Normandeau *et al.*, 2011). Kirschvink *et al.* (1986) suggested that species that were sensitive to changes in the Earth's magnetic field and that are likely to be present within the Proposed Development include harbour porpoise, Risso's dolphin, and common dolphin. However, the majority of these have had a theoretical evidence base, coming to differing conclusions regarding species' sensitivity to changes in electric and magnetic fields (Normandeau *et al.*, 2011). Furthermore, there has been no observation of behavioural responses by these cetacean species to EMF reported in the literature (Normandeau *et al.*, 2011).

3.3.4.2 Although, theoretically, there is the potential for some very localised behavioural effects, no evidence exists at present that Annex IV listed marine mammal species are magneto- or electro-sensitive. As a result, any potential behavioural responses would be unforeseen due to lack of evidence. In turn, given an absence of evidence for sensitivity, and the limited scale of any potential impact, there is no risk of any individual-level or population-level impacts from EMF. Therefore, there is no risk of deliberate disturbance of Annex IV cetacean species, and a derogation licence is not required.

ACCIDENTAL POLLUTION

3.3.4.3 As outlined in Section 3.2, the likelihood of an accidental pollution event is extremely low. The Applicant has integrated mitigation measures to effectively prevent accidental pollution in Section 11.7.3 and Tabe 11.15 in Annex E of this document. These mitigation measures will ensure that the risk of accidental pollution is very low, and in turn any potential behavioural responses would be unforeseen, with no risk of any population-level impacts. Therefore, there is no risk of deliberate disturbance of Annex IV cetacean species, and a derogation licence is not required.

UNDERWATER NOISE GENERATING ACTIVITIES

ANALYSIS OF PROPOSED ACTIVITIES

3.3.4.4 Each Proposed Activity was analysed to determine whether it would generate underwater noise at levels capable of causing deliberate disturbance of Annex IV species.

3.3.4.5 This analysis identified that a number of the Proposed Activities would either not generate underwater noise, or produce only low-level underwater noise that are not at levels capable of causing disturbance, or would only lead to a disturbance effect within the footprint of the disturbance effect of the vessel from which it would occur. These Proposed Activities have

therefore been screened out of further consideration in the assessment of deliberate disturbance to Annex IV cetacean species as documented in Table 3-3.

Table 3-3: Justification of Proposed Activities that have been screened out of further consideration of deliberate disturbance to Annex IV cetaceans

Proposed Activities screened out of the assessment	Justification
Pre-construction and Construction – Other pre-construction surveys (Metocean, environmental, corrosion, sediment dynamics, post installation/as built remotely operated vehicle (ROV) surveys)	These surveys will not use equipment that actively emits underwater noise, nor will the equipment interact with the environment in such a way that produces noise to the level that could cause deliberate disturbance. Therefore, there is no risk of deliberate disturbance from the survey equipment. The risk of deliberate disturbance from the vessels associated with the confirmatory surveys (other) will be assessed under the overarching Vessels activity group.
Pre-construction and Construction – Infrastructure preparation and installation activities	These activities will not use equipment that actively emits underwater noise. Whilst some activities interact with the environment in a way that produces noise, it is expected that any area of elevated noise would be within the footprint of the noise from the vessel activity. Therefore, any impact from these activities would be included within the impact from vessel activity and would not act additively. The risk of deliberate disturbance from the vessels associated with the other construction activities will be assessed under the overarching Vessels activity group. Therefore, the risk of deliberate disturbance the other pre-construction and construction activities has therefore been screened out of the risk assessment.
O&M - Surveys (other than geophysical), infrastructure maintenance and repairs	These activities will not use equipment that actively emits underwater noise, nor will the activities interact with the environment in such a way that produces noise to the level that could cause deliberate disturbance. Therefore, there is no risk of deliberate disturbance from the activity. The risk of deliberate disturbance from the vessels associated with the Operation and Maintenance – Other activities will be assessed under the overarching Vessels activity group.
UXO clearance	There is no UXO identified within the site and therefore UXO clearance is not required on the basis of current knowledge. Therefore, this activity has not been included in this assessment.

3.3.4.6 The activities that have therefore been screened in for detailed assessment are: geophysical surveys, geotechnical surveys, vessel noise, dredging and trenching, and foundation installation.

3.3.4.7 The details of the methodology used to assess the distance over which disturbance could occur, and the number of animals potentially disturbed, is detailed in Annex S of this document.

GEOPHYSICAL AND GEOTECHNICAL SURVEYS

3.3.4.8 Through the MMMP, the Applicant will implement mitigation measures for geophysical and geotechnical surveys that are fully aligned with the measures listed within the DAHG (2014) Guidance to manage the risk to marine mammals from man-made sound sources in Irish Waters (see Annex D of this document for further details). Therefore, all the necessary mitigation measures to avoid a disturbance effect have been implemented by the Applicant for geophysical and geotechnical surveys. As such, any incidental disturbance of individual specimens despite these mitigation measures would not be considered deliberate under Article 12(1) of the Habitats Directive, RED III and the Habitats Regulations. Therefore, there is no risk of deliberate

disturbance of Annex IV cetacean species, and a derogation licence is not required for these activities.

VESSEL ACTIVITY

3.3.4.9 The Environmental VMP in Annex J of this document will reduce the risk of vessel disturbance through underwear noise by controlling the speed and movement of vessels, resulting in slower moving vessels that produce less noise, and travelling more predictable routes which are less likely to cause disturbance (Lusseau 2003; 2006; Nowacek *et al*., 2001). Therefore, the necessary mitigation measures to avoid a disturbance effect have been implemented by the Applicant for vessels. As such, any incidental disturbance of individual specimens despite these mitigation measures would not be considered deliberate under Article 12(1) of the Habitats Directive, RED III and the Habitats Regulations. Notwithstanding taking a precautionary approach, there is no risk of deliberate disturbance of Annex IV cetacean species, and a derogation licence is not required for this activity.

DECOMMISSIONING

3.3.4.10 The exact nature, sequence and timing of decommissioning activities is unknown at this stage as decommissioning would not occur until the end of the operational lifetime. Table 3-2 identifies the works which will be required during decommissioning activities, specifically the use of vessels, and removal of foundations and structures which may cause potential Regulation 51 Impacts.

3.3.4.11 With regards to vessel activities, the implementation of necessary mitigation measures during all phases including the decommissioning activities would result in no deliberate disturbance under Article 12(1) of the Habitats Directive in accordance with the provisions of REDIII and the Habitats Regulations.

3.3.4.12 The decommissioning activities will comprise the removal of WTG and OSP monopile foundations (cut 2 m below seabed level). Whilst the exact method that will be used for this is unknown, some of the methods available can produce noise. The noise typically produced by monopile removal techniques (e.g. water-jet or abrasive cutting) is continuous noise, which is less impactful to marine mammals than impulsive noise such as that produced during foundation installation. Measured noise levels during decommissioning (Hinzmann *et al.,* 2017) demonstrated that the noise produced was below the levels that could cause auditory injury (PTS) in all marine mammal hearing groups. The measured noise level at 10 m from the decommissioning activities (175 dB re 1 µPa at 10 m distance, based on SEL_{05}) is similar to the noise levels produced by other construction activities such as dredging and trenching, as presented in Section 5 of Annex K of this document (which comprises the underwater noise modelling report).

3.3.4.13 Therefore, the noise from decommissioning activities can be considered as having potential to cause similar impacts to cetaceans those from dredging and trenching activities. Accordingly, the assessment of impacts from dredging and trenching in Table 3-7 can be considered as a suitable proxy for the assessment of impacts from decommissioning activities. The result of that assessment was that no derogation licence was required for dredging and trenching, therefore this conclusion is considered to apply to decommissioning activities also on the basis of available information. Accordingly, there is no risk of deliberate disturbance of Annex IV cetacean species, and a derogation licence is not required for this activity. It is acknowledged that there is uncertainty in this assessment and that an updated risk assessment will be carried out prior to the undertaking of decommissioning activities.

FOUNDATION INSTALLATION

3.3.4.14 Through the MMMP (Refer to Annex D of this document), the Applicant will also implement mitigation measures for foundation installation. The mitigation measures will mitigate for the risk of auditory injury to marine mammals, by using avoidance and deterrent-based measures to ensure marine mammals remain outside of the area of injury or the 'mitigation zone'. These measures comprise the use of an extended ramp up mitigation scenario, an Acoustic Deterrent Device (ADD), and monitoring (visual or acoustic) of the mitigation zone. It is acknowledged some of the proposed measures, specifically Passive Acoustic Monitoring (PAM) and ADDs, which are deviations from the advice outlined in DAHG guidance (DAHG, 2014). However, both PAM and ADDs have been significantly developed since the publication of the DAHG guidance in 2014, and are now included in industry-standard mitigation guidance documents published by government agencies (such as by JNCC in the UK; JNCC, 2023; JNCC, 2025a). As a result, both PAM and ADDs are implemented as industry standard during foundation installation in other regions such as the UK. Therefore, the Applicant considers that these are appropriate measures for the Proposed Development based on professional judgement.

3.3.4.15 Despite the mitigation measures committed to, foundation installation has the potential to induce disturbance in cetaceans beyond the area where mitigation measures will be applied to reduce the risk of injury. Therefore, deliberate disturbance has not been excluded and an assessment of the risk of deliberate disturbance has been undertaken for foundation installation.

MODELLED DELIBERATE DISTURBANCE ON ANNEX IV SPECIES

3.3.4.16 Foundation installation activities such as monopile piling or drilling, or a combination of both (drive-drill-drive) leads to elevations in underwater noise and vibration, which can in turn lead to disturbance effects on marine mammals.

3.3.4.17 Underwater noise modelling for WTG and OSP foundation impact piling (see Annex K of this document for more detail on the modelling and Annex S for a summary of the approach) was undertaken at five representative locations covering the extents of the Proposed Development. The modelled locations were chosen to give the greatest geographical spread to maximise the potential impact ranges to the north and the south of the site. The modelled piling parameters are:

- 11 m monopile foundations at the North (N), Central (C) and Southwest (SW) WTG locations, installed with a maximum blow energy of 3,500 kJ; and
- 14 m monopile foundations at the North OSP (N-OSP) and South OSP (S-OSP) locations, installed with a maximum blow energy of 3,500 kJ.

3.3.4.18 All modelling results (in Annex K of this document) are presented for the extended ramp-up mitigation scenario, which has been committed to by the Applicant.

PTS (AUDITORY INJURY) AND TTS

3.3.4.19 The instantaneous and cumulative (over 24 hours) PTS and TTS-onset impact ranges have been determined using underwater noise modelling of the thresholds presented by Southall *et al.* (2019). The calculated PTS- and TTS-onset impact ranges represent the minimum starting distances from the piling location for animals to escape and prevent them from receiving a dose higher than the threshold. Further information on the modelling approach and the methods used the calculate PTS and TTS-onset impact ranges is provided in Section 3 of Annex K of this document).

3.3.4.20 The number of individuals that may be affected by PTS was quantified by multiplying the impact-onset area by the density estimates for each species. This has been presented as an absolute number and as a proportion of the reference population. The animal density per km^2 taken forward within this assessment follows the approach used within the EIAR and NIS presented in Annex E and Annex F of this document. Of note is two density estimates are presented for bottlenose dolphins (Table 4-1 and Table 4-3 in Annex E) to reflect the substantial regional variation observed across survey years and areas. Including both values provides important context, as bottlenose dolphin densities can differ drastically, which in turn influences how abundance estimates are interpreted.

3.3.4.21 No assessment of the number of animals is given for TTS-onset because there are no thresholds to determine a biologically significant effect from TTS-onset. However, TTS ranges have been presented as they may result in disturbance in marine mammals.

Table 3-4: PTS-onset from pile driving at the all locations based on the extended ramp-up mitigation scenario

Species	Piling Location	Density[1] (animals/km^2)	Area (km^2)	Maximum range (m)	Number of animals[2]	% of reference population
Instantaneous PTS-onset (unweighted SPL_{peak})						
Harbour porpoise	N WTG	0.38	1.0	580	<1	<0.01
	C WTG		1.3	680		
	SW WTG		0.9	580		
	N-OSP		0.8	520		
	S-OSP		0.4	380		
Bottlenose dolphin	WTG (N, C and SW) OSP (N and S)	0.0201	<0.01	<50	<1	<0.01
		0.2352	<0.01	<50	<1	<0.01
Risso's dolphin		0.031	<0.01	<50	<1	<0.01
Common dolphin		0.0272	<0.01	<50	<1	<0.01

[1] The density presented for each marine mammal receptor represents the highest available density estimate to provide the worst-case scenario results.

[2] *The predicted number of individuals that could be within the area of PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal for all species assessed, when multiplying the density estimate by the area of PTS-onset. However, this does not take into account the avoidance and deterrent-based mitigation measures committed to by the Applicant. The maximum PTS-onset ranges for all species falls within the 1,000 m R_{safe} distance, which will be fully mitigated through the use of an ADD, alongside monitoring (visual or acoustic) to confirm deterrence of all animals beyond the 1,000 m R_{safe} distance. Therefore, the extended ramp-up mitigation and other mitigation measures will ensure that all marine mammals are displaced from the area where PTS could occur, consequently no animals are expected to experience PTS.

Species	Piling Location	Density[1] (animals/km^2)	Area (km^2)	Maximum range (m)	Number of animals[2]	% of reference population
Minke whale	WTG (N and SW) OSP (N and S)	0.045	<0.01	50	<1	<0.01
	C WTG		<0.01	60		
Cumulative PTS-onset (weighted SEL_{cum})						
Harbour porpoise	WTG (N, C and SW) OSP (N and S)	0.38	<0.01	<50	<1	<0.01
Bottlenose dolphin	WTG (N, C and SW) OSP (N and S)	0.2352	<0.01	<50	<1	<0.01
		0.0201	<0.01	<50	<1	<0.01
Risso's dolphin		0.031	<0.01	<50	<1	<0.01
Common dolphin		0.0272	<0.01	<50	<1	<0.01
Minke whale	N WTG	0.045	0.04	170	<1	<0.01
	C WTG		0.58	870		
	SW WTG		0.08	330		
	N-OSP		0.02	120		
	S-OSP		<0.01	70		

Table 3-5: TTS-onset from pile driving at WTG and OSP locations based on the extended ramp-up mitigation scenario

Species	Impact	Piling location				
		N-WTG	C-WTG	SW-WTG	N-OSP	S-OSP
Instantaneous TTS-onset (unweighted SPL_{peak})						
Harbour porpoise (VHF cetacean)	Area (km^2)	4.9	5.8	4.6	3.8	1.7
	Maximum range (m)	1,400	1,600	1,400	1,200	880
Bottlenose dolphin, Risso's dolphin, common dolphin (HF cetacean)	Area (km^2)	<0.01	<0.01	<0.01	<0.01	<0.01
	Maximum range (m)	<50	<50	<50	<50	<50
Minke whale (LF cetacean)	Area (km^2)	0.05	0.06	0.04	0.04	0.02
	Maximum range (m)	120	140	120	110	80
Cumulative TTS-Onset (weighted SEL_{cum})						
Harbour porpoise (VHF cetacean)	Area (km^2)	690	1,100	1,100	570	670
	Maximum range (m)	25,000	30,000	29,000	24,000	24,000
Bottlenose dolphin, Risso's dolphin, common dolphin (HF cetacean)	Area (km^2)	<0.01	<0.01	<0.01	<0.01	<0.01
	Maximum range (m)	<50	<50	<50	<50	<50
Minke whale (LF cetacean)	Area (km^2)	2,100	3,200	2,900	1,600	1,100
	Maximum range (m)	44,000	51,000	50,000	41,000	33,000

3.3.4.22 The impact ranges for marine mammals from foundation installation are some of the largest predicted across the Proposed Activities. As presented in Table 4-1, this impact is calculated to occur in less than one individual prior to mitigation, which equates to a very small proportion of the population affected (<0.01%). However, with the implementation of the mitigation measures, which involves the establishment of an R_{safe} of 1000m, in practice there will be no cetaceans exposed to noise that could induce PTS-onset. The impact ranges for TTS, particularly cumulative TTS, are notably higher than for PTS, which would lead to a greater number of animals being exposed to noise at levels that could induce TTS-onset.

3.3.4.23 Full details on PTS and TTS-onset impact ranges from pile driving for each marine mammal species at each of proposed locations are provided in Sections 11.9 through to 11.14 within Annex E of this document.

BEHAVIOURAL RESPONSES

3.3.4.24 Behavioural responses to underwater noise can vary greatly, both within and between species. A species-specific approach has been taken to determine the range over which behavioural responses may occur, using approaches available in the published literature.

3.3.4.25 A species-specific dose-response approach was used for this assessment of disturbance to harbour porpoise from underwater noise during pile driving. In the absence of species-specific dose-response data for dolphins or minke whales, and given that the application of the harbour porpoise dose-response curve (Graham *et al.,* 2017) is considered over precautionary when considering observed responses of other cetacean species (e.g. Fernandez-Betelu *et al.*, 2021; Kastelein *et al.*, 2006; Stone *et al.*, 2017), the US National Marine Fisheries Service (NMFS) Level B harassment thresholds for strong disturbance have been used for dolphins and minke whales in this assessment. It should be noted that Level B distances are not species specific. The maximum distances modelled for Level B harassment are:

- 22,000 m for the installation of an 11 m monopile at the N WTG location.
- 26,000 m for the installation of an 11 m monopile at the C WTG location.
- 24,000 m for the installation of an 11 m monopile at the SW WTG location.

3.3.4.26 The number of individuals of each marine mammal species predicted to experience behavioural disturbance as a result of pile driving is presented in Table 4-3, alongside the proportion of the respective reference population. The predictions for each of the modelling locations are presented separately. Disturbance from concurrent piling for the Proposed Development has not been assessed as piling will be limited to one installation per day. The animal density per km^2 taken forward within this assessment follows the approach used within EIAR and NIS which are included in Annex E and Annex F of this document.

3.3.4.27 To note, the use of the Level B harassment threshold to determine disturbance distance is likely over-precautionary. JNCC (2025b) have published Effective Deterrent Ranges (EDRs) for harbour porpoise from noise-producing activities including piling. EDRs provide an empirically-derived estimate of the spatial extent over which the bulk of the disturbance response by harbour porpoises will occur, though they do not correspond to complete avoidance and may overestimate the distances at which effects are consistently observed (JNCC, 2025b; JNCC, 2020). For monopile installation without noise abatement systems, reported EDRs vary, with most studies indicating ranges of 15–20 km, with a weighted average of 17.4 km based on 14 studies (Brown *et al.*, 2025). A recent study included in the Brown *et al.* (2025) review was from Moray West, which observed an EDR of 9.4 km, highlighting that the 20 km EDR recommended by JNCC is precautionary. To note, the approach taken by JNCC (2025b) to calculating EDRs is precautionary as they represent the maximum disturbance response typically recorded at the start of the piling campaign. The disturbance distance of harbour porpoise is predicted to decrease over the duration of the piling campaign, as evidence by Graham *et al.* (2019).

Table 3-6: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population

Species	Density	Impact	Piling Location				
			N WTG 11 m	C WTG 11 m	SW WTG 11 m	N-OSP 11 m	S-OSP 11 m
Harbour porpoise	0.38	#	1,456	1,908	1,753	1,270	1,109
		%	2.33	3.05	2.80	2.03	1.77
Common dolphin	0.0272	#	21	30	30	18	16
		%	0.02	0.03	0.03	0.02	0.02
Bottlenose dolphin	0.0201	#	16	23	23	14	12
		%	5.46	7.85	7.85	4.78	4.10
	0.2352	#	179	259	259	153	132
		%	61.09	88.40	88.40	52.22	45.05
		%*	2.15	3.12	3.12	1.84	1.59
Risso's dolphin	0.031	#	24	35	35	21	18
		%	0.20	0.29	0.29	0.17	0.15
Minke whale	0.045	#	35	50	50	30	26
		%	0.17	0.25	0.25	0.15	0.13

Source: SCANS-IV density estimates / SCANS-III density estimates / ObSERVE estimates used in calculations from Gilles *et al.* (2023), Hammond *et al.* (2021) and Rogan *et al.* (2018)

*Secondary bottlenose dolphin reference abundance from SCANS-IV (Gilles *et al.*, 2023), provides estimates from Block CS-D at 8,326 rather than 293 from MU populations in IAMMWG (2023) to provide more realistic populations relevant to the Proposed Activities

3.3.4.28 Population modelling provided in Annex L of this document (which comprises the Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling), was conducted to determine whether the level of disturbance from foundation installation (specifically pile-driving) is expected to result in population-level impacts. The results of the population modelling showed that there is no significant effect of disturbance from pile driving at the Proposed Development to the populations of harbour porpoise, bottlenose dolphin, and minke whale (the species for which iPCoD modelling is possible to undertake). For harbour porpoise, the impacted population is predicted to continue at a stable trajectory never falling below 99.89% as compared to the mean un-impacted population. For bottlenose dolphin, the mean impacted population size initially decreases very slightly as compared to the mean un-impacted population size in response to piling. However, shortly after piling the impacted population continues on the same, stable trajectory never falling below 98.09% of the mean un-impacted population size. Furthermore, for minke whale, impacted population is predicted to continue at a stable trajectory at exactly the same size as the un-impacted population.

3.3.4.29 It is highlighted that the population modelling provided in Annex L of this document, was undertaken at the time of submission (June 2024) and so is based on Project Design Option parameters that have since been refined further (i.e. the maximum hammer energy has been reduced, there are fewer WTGs and associated piles required etc.). Specifically, the modelling was conducted under the original ramp-up mitigation scenario, which doesn't have an extended ramp up and thus has a higher maximum energy of 6000 kJ. However, it was not considered necessary to update the iPCoD modelling because the revised piling parameters remain within the overall range assessed in the iPCoD modelling. The original iPCoD modelling outputs remain valid for the purposes of assessment and are considered precautionary, as they are based on a scenario that reflects equal or greater impact potential than the revised design which is detailed in Annex A of this document.

RISK OF DELIBERATE DISTURBANCE

3.3.4.30 Deliberate disturbance to Annex IV species that may arise during foundation installation activities are unlikely to affect changes of survival, breeding success or reproductive ability, in view of European Commission (2021) guidance. However, they will likely lead to a reduction in the occupied area or the relocation or displacement of the species (the other consideration outlined by the European Commission guidance (2021)), albeit on a temporary basis.

3.3.4.31 The potential for foundation installation to affect changes of survival, breeding success or reproductive ability, can be informed by the population modelling undertaken for the Proposed Activities, using iPCoD which is provided in Annex L of this document. The population modelling predicted the following:

- That the minke whale population remained at 100% and on a stable trajectory under both the impacted and un-impacted scenarios, demonstrating that no change to the population will occur from foundation installation.
- The harbour porpoise population under the impacted scenario remained at 99.9% of the unimpacted population, and on a stable trajectory, also demonstrating a lack of population-level effects.
- For bottlenose dolphin, modelling predicted that the population would continue at a stable trajectory at 98.58-98.72% of the size of the un-impacted population.
- The Applicant therefore concludes that the foundation installation will not affect changes of survival, breeding success or reproductive ability to the extent that it leads to a change to the species' population. To note, the iPCoD modelling presented in Annex L of this document, is based on the original maximum piling parameters at the time of submission (i.e. June 2024) which have since been refined (i.e. the maximum hammer energy has been reduced, there are fewer WTGs and associated piles required etc.). However, the modelling remains valid for

the purposes of assessment and are considered precautionary, as they are based on a scenario that reflects equal or greater impact potential than the revised design which is detailed in Annex A of this document.

3.3.4.32 Based on Level B harassment thresholds, behavioural responses from foundation installation may be observed up to 26 km from the piling location. These responses are expected to be short term (i.e. disturbance only occurs on the day when piling occurs, with no "residual" disturbance), reversible/recoverable, and diminish with time during the foundation installation campaign. However, the disturbance effect will occur on a frequent basis, as piling will occur on a minimum of 55 days and for up to 5 hours 10 mins on each day (i.e. as per Project Design Option 1). This may lead to repeated disturbance of Annex IV cetaceans that could lead to impacts on individual specimens. Therefore, it would still constitute a reduction in the occupied area or the relocation or displacement of the species.

3.3.4.33 Cetaceans are highly mobile and wide-ranging, therefore the most appropriate level to consider impacts against is the regional population, in the absence of defined local populations. The percentage of the reference population that could show a response is less than 1% for common dolphin, Risso's dolphin and minke whales. Between 1 and 7.85% of the harbour porpoise and bottlenose dolphin reference populations may show a behavioural response, which is higher compared to the other species. The iPCoD modelling (in Annex L of this document) shows that impacts at the population-level are not significant, with a maximum change of <2% in the bottlenose dolphin population, 0.11% in the harbour porpoise population, and no change in the minke whale population.

3.3.4.34 The Applicant has committed to implementing marine mammal mitigation measures during foundation installation (as detailed within Annex D of this document). These include the implementation of a marine mammal mitigation zone, monitoring using marine mammal observers during daylight hours, and ramp-up procedures, that adhere to DAHG (2014) guidelines. In addition, the Applicant is committed to using PAM prior to the start-up of piling at night-time and poor visibility, and the use of an ADD prior to all foundation installation. The ADD duration will be sufficient to deter marine mammals outside of the predicted PTS-onset zones, therefore there is negligible residual risk of PTS in Annex IV species. Therefore, no further additional measures are required to avoid auditory impacts (i.e., PTS), which the Applicant considers representing a specific form of disturbance (i.e. Regulation 51 Impact). Whilst the use of an ADD and other mitigation measures (ramp-up, marine mammal monitoring) will also reduce the risk of animals being within the area closest to the foundation location where TTS or behavioural responses would be strongest, there is still a residual risk that animals could experience TTS or behavioural disturbance outside of this zone.

3.3.4.35 The mitigation measures are primarily aimed at reducing the risk of injury. It is the Applicant's view that injury should be considered a subset of disturbance under the Habitats Directive, therefore mitigation to reduce the risk of injury is beneficial in reducing this specific form of disturbance. However, mitigation measures aimed at reducing the risk of injury, may not reduce the risk of behavioural responses. It is also noted that the ADD will actively deter marine mammals from the mitigation zone, which may add to the overall disturbance effect.

3.3.4.36 Therefore, the Applicant cannot exclude the risk of deliberate disturbance during foundation installation and a derogation licence is required for piling activities.

DREDGING AND TRENCHING

3.3.4.37 As part of seabed preparation for construction, seabed lowering and feature clearance may be required by dredging. Additional dredging activities may be required during the O&M phase for the repair and maintenance of scour protection at the WTG and OSP foundations, as well as

maintenance of inter-array cables, interconnector cables and offshore export cables. Trenching will be required during the cable installation.

3.3.4.38 The source levels of underwater noise from dredging and trenching are presented in Table 3-7. Full details of the underwater noise modelling methodology, assumptions, and resulting impact ranges for dredging (backhoe), dredging (suction) and trenching are detailed in Sections 3 and 5 of Annex K of this document. Source levels for Trailing Suction Hopper Dredging (TSHD) are presented in McQueen *et al.*, (2020).

Table 3-7: Estimated source levels for dredging and trenching

Activity	SPLpk (dB re 1µPa @ 1 m)
Dredging (backhoe)	165
Dredging (suction)	186
TSHD	186
Trenching	172

PTS (AUDITORY INJURY) AND TTS

3.3.4.39 Dredging and trenching produce a continuous and non-impulsive noise which is generally considered very unlikely to result in PTS in marine mammals (Todd *et al.*, 2015; Southall *et al.*, 2019). The main energy of dredging and trenching, is listed as being below 1 kHz (Todd *et al.*, 2015). This is within the estimated peak sensitivity range of minke whales (LF cetacean) but out of the peak hearing ranges of harbour porpoise (VHF cetaceans) and dolphin (HF cetaceans).

3.3.4.40 To quantify the impact of underwater noise resulting from dredging and trenching on marine mammals with regard to PTS and TTS, the cumulative (over 24 hours) PTS and TTS-onset impact ranges have been determined using the thresholds presented by Southall *et al.* (2019) Table 3-8. Further information on the modelling approach and the methods used the calculate PTS and TTS-onset impact ranges is provided in Section 3 of Annex K to this document. The predicted ranges are presented in Table 3-8. Given that all ranges are <1 km, and many are <50 m, the likelihood of cetaceans being within these distances is very low.

Table 3-8: Weighted LE,p,24h,wtd impact ranges for marine mammals using the Southall *et al.* (2019) non-impulsive criteria for the dredging and trenching assuming a fleeing receptor

Activity	PTS (Non-impulsive)				TTS (Non-impulsive)			
	LF (199 dB)	HF (198 dB)	VHF (173 dB)	PCW (201 dB)	LF (179 dB)	HF (178 dB)	VHF (153 dB)	PCW (181 dB)
Dredging (backhoe)	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m
Dredging (suction)	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	250 m	< 50 m
Trenching	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	< 50 m	820 m	< 50 m

3.3.4.41 Although PTS is a permanent auditory effect, exposure to noise levels capable of inducing TTS is more likely to elicit behavioural avoidance rather than injury (Southall *et al.*, 2007). Evidence from other studies demonstrates that harbour porpoises exposed to similar continuous noise sources typically move away from the source, thereby leaving the zone where PTS onset could

occur (Hermannsen *et al.*, 2015). In addition, vessel presence itself is expected to act as a deterrent, further reducing the likelihood of animals remaining in the immediate vicinity at the onset of construction activities (Benhemma-Le Gall *et al.*, 2023).

BEHAVIOURAL DISTURBANCE

3.3.4.42 Studies have confirmed that underwater noise from dredging activities can cause displacement and disturbance to marine mammals (Culloch *et al.*, 2016; Pirotta *et al.*, 2013). However, it is difficult to determine the disturbance response from dredging activities in isolation from the disturbance from vessel presence required for the activity (Todd *et al.*, 2015). There are no equivalent studies on trenching, therefore dredging is used as a proxy to inform the combined assessment of disturbance from dredging and trenching.

3.3.4.43 Dredging activities have been shown to cause harbour porpoise displacement within a radius of 5 km around the dredging location (Verboom, 2014). Diederichs *et al.* (2010) noted there was short term avoidance (around 3 hours) at distances of up to 600 m from a TSHD, but no significant long-term impacts. Modelling potential impacts of dredging of a port expansion predicted a disturbance range of 400 m, with a more conservative approach predicting avoidance of harbour porpoise up to 5 km (McQueen *et al.* 2020). Whilst there are studies indicating a variety of responses (or lack of responses) by other cetacean species to dredging (e.g. Pirotta *et al.*, 2013; Marley *et al.*, 2017; Culloch *et al.*, 2016), no disturbance distances are provided in these studies. Therefore, the 5 km displacement distance for harbour porpoise has been used for all cetacean species, which is precautionary given the overall high sensitivity of harbour porpoise to underwater noise. The spatial scale over which disturbance effects may arise is small i.e. a maximum of 5 km, equating to an area of approximately 78.5 km^2. The maximum number of Annex IV individuals that may be within this area are presented in Table 3-9.

Table 3-9: Predicted impact of disturbance to marine mammals from dredging and trenching assuming a 5 km radius

Species	Density[4] (animals/km^2)	Area (km^2)	Number of animals	% of reference population
Harbour porpoise	0.38	78.5	30	0.05
Bottlenose dolphin	0.0201	78.5	2	0.5
	0.2352	78.5	19	0.23[3]
Risso's dolphin	0.031	78.5	3	0.02
Common dolphin	0.0272	78.5	3	<0.01
Minke whale	0.045	78.5	4	0.02

3.3.4.44 It is highlighted that the scale of disturbance from dredging and trenching will be very similar to the disturbance predicted around vessels (i.e. 4 km for harbour porpoise; Benhemma-Le Gall *et al.*, 2022).

[3] Secondary bottlenose dolphin reference abundance from SCANS-IV (Gilles et al., 2023), provides estimates from Block CS-D at 8,326 rather than 293 from MU populations in IAMMWG (2023) to provide more realistic populations relevant to the Proposed Activities.

3.3.4.45 The disturbance effect to Annex IV species that may arise during dredging and trenching activities would not affect changes of survival, breeding success or reproductive ability, nor lead to a reduction in the occupied area or the relocation or displacement of the species, in view of European Commission (2021) guidance.

3.3.4.46 The proportion of animals temporarily affected is significantly lower than the proportion disturbed through foundation installation, comprising ~1.5% of the number of animals disturbed from foundation installation (e.g. 30 harbour porpoise compared to 1,908 harbour porpoise under the original maximum piling parameters). As per the iPCoD modelling results for foundation installation presented in Annex L of this document, the modelled disturbance was not sufficient to result in any changes at the population level for harbour porpoise, minke whale and bottlenose dolphin, and that all these species continued at a stable or increasing population trajectory, same as the un-impacted population. Therefore, not leading to a change in survival, breeding success or reproductive ability of the species. This conclusion is applicable to deliberate disturbance from dredging and trenching where the numbers impacted are significantly lower than deliberate disturbance from foundation installation. Furthermore, any disturbance would be highly localised and temporary, in that it would be restricted to the duration of the activity (i.e. dredging or trenching) and fully recoverable afterwards. It is also highlighted that dredging and trenching are mobile activities and therefore any impact in an occupied area would be temporally limited to a shorter duration than that of the overall dredging or trenching activity. Therefore, the Applicant has determined that the effect from dredging and trenching on Annex IV species would not meet the definition of deliberate disturbance outlined in the European Commission (2021) guidance.

3.3.5 Conclusion

3.3.5.1 The risk assessment identified five Annex IV cetacean species that may be within the vicinity of the Proposed Development: harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin, and minke whale.

3.3.5.2 This assessment concludes that no deliberate killing (as defined in Regulation 51(2)(a) of the Habitat Regulations) will result from the Proposed Activities. Taking into account the mitigation committed to by the Proposed Development, the Applicant considers that any killing of Annex IV species that may occur as a result of vessel collision or accidental pollution would not constitute "deliberate" killing, in view of Section 55B(2) of the Habitats Regulations, REDIII Commission's Guidance based on CJEU cases C-103/00 and C-221/04, and the EC Guidance to Member States on good practices to speed up permit-granting procedures for renewable energy projects and on facilitating Power Purchase Agreements SWD (2022) 149.

3.3.5.3 The assessment concludes that there is potential for deliberate disturbance under Regulation 51(2)(b) from foundation installation associated with the Proposed Development. This conclusion is reached for foundation installation only, as there is a residual risk of deliberate disturbance from piling (in the form of TTS or behavioural responses), despite the application of mitigation measures that have been committed to. The Applicant considers that they have taken reasonable steps to effectively reduce disturbance through these mitigation measures. It is highlighted that behavioural responses that may occur as a result of foundation installation will not affect changes in survival, breeding success or reproductive ability to the extent that it leads to a change at the population level. However, reduction in the occupied area or the relocation or displacement of the species from foundation installation may occur, albeit on a temporary basis. Therefore, a derogation licence is required to be sought specifically for deliberate disturbance from piling required to support the foundation installation for the Proposed Development.

3.3.5.4 The assessment concludes that the only activity associated with the Proposed Development which will result in deliberate disturbance under Regulation 51(2)(b) is piling associated with the

foundation installation. The following Proposed Activities will not result in deliberate disturbance: geophysical survey, geotechnical survey, vessel noise, dredging and trenching, EMF, and accidental pollution. This conclusion is reached on the basis of negligible risk of disturbance from these activities, and/or the implementation of the necessary mitigation measures to reduce disturbance thereby resulting in no deliberate disturbance, where applicable.

3.3.5.5 There is considered to be no risk of deliberate disturbance from other pathways associated with the Proposed Development. In addition, there is considered to be no risk of any other offence under Regulation 51(2) (i.e. Parts a, c, d and e). Therefore, a derogation licence is not required for these activities.

4 Ecological Survey and Site Assessment

4.1 Overview

4.1.1.1 This section provides the evidence on the baseline characterisation and the assessment of deliberate disturbance on the relevant Annex IV species. This has been undertaken at the relevant spatial scales in accordance with the NPWS requirements with evidence from the site-specific surveys (including data collected within the last 12-18 months) and modelling that has been undertaken is detailed herein to support the derogation licence application.

4.2 Pre-existing information on species at location and environs

4.2.1.1 Information on Annex IV species at the location of the Proposed Development and surrounding environs have been collated through a detailed review of existing studies and datasets. The desk study sources used within this risk assessment are described in detail within Annex G and Annex H of this document and are summarised below. Further information on the survey methodology and survey results, which have been used to inform the baseline characterisation, are presented in Sections 4.6 and 4.7 of this document.

4.2.2 Harbour porpoise

ECOLOGY

4.2.2.1 Harbour porpoise have a varied diet, largely consisting of whiting (*Merlangius merlangus*), herring (*Clupea harengus*), and small cod (*Trisopterus* spp) (Hernandez-Milian *et al.,* 2011). Their high metabolic rate requires them to eat up to 10% of their body weight in food per day (Booth, 2019). Harbour porpoises give birth to one calf every year between May and August (with peaks in June and July), and mating occurs between April and September, with a gestation period of 10 - 11 months (Blanchet *et al.,* 2008).

DISTRIBUTION AND OCCURRENCE

4.2.2.2 Harbour porpoise are the most widespread and frequently recorded species off the east coast of the Republic of Ireland, sighted throughout the year with an increased presence in July and August (Ó Cadhla *et al.*, 2004; Berrow *et al.*, 2010; Wall *et al.*, 2013; Rogan *et al.* 2018a). The ObSERVE data from the aerial surveys highlighted the importance of the Irish Sea for harbour porpoise in the context of the waters around Ireland, as sightings were frequently recorded along the east coast of Ireland, particularly during the summer months (Rogan *et al.,* 2018a). Records from the National Biodiversity Data Centre (NBDC) further supports this pattern (NBDC, 2023). These peaks tend to coincide with key life-history periods. Modelled density outputs indicated eastern Ireland, particularly the coastal area from Co. Dublin south to Co. Waterford, is likely to be an important area for harbour porpoise (Evans and Waggitt, 2023).

4.2.2.3 Acoustic records for harbour porpoise in Dublin Bay found that porpoises were detected on all days and within most one-hour periods (81% of possible hours had porpoise detections) over a 46-day recording period (Berrow *et al.,* 2008). The mean porpoise positive minutes (PPM) per hour in Dublin Bay were on average 14.7 with peaks in August (15.6) and September (13.5) and lower values in July (8.9).

4.2.2.4 Acoustic monitoring of harbour porpoise conducted for ABWP1 in August 2002 found that harbour porpoises were present on 16 out of the 25 deployment days giving an estimated 64% occupancy

in this area. Compared to inshore waters to the north in Dublin Bay, the occurrence of harbour porpoise at Arklow Bank is lower.

4.2.2.5 Harbour porpoises were recorded in all years during the historic site-specific boat-based surveys (Cork Ecology, 2009, 2008 and 2007; Coveney Wildlife Consulting Ltd., 2005). Sightings were noted throughout the 'Bank' and 'Box' survey areas during the surveys, and there were also sightings further inshore along the cable route.

4.2.2.6 The site-specific digital aerial surveys (DAS) also found that harbour porpoises were distributed throughout the Marine Mammal Study Area and Extended Marine Mammal Study Area, including the area between the Array Area and the coast (HiDef, 2020a) and the Array Area and 2 km buffer.

4.2.2.7 Sightings were noted in most survey months. In addition, harbour porpoise were the most abundant species recorded during the geophysical survey campaigns of the Proposed Development in 2019 and 2020 with a total of 24 sightings recorded in 2019 and a total of 51 sightings recorded in 2020 (IWDG, 2019; Gavin & Doherty Geosolutions Ltd, 2020). They were also recorded during the geotechnical survey campaign of the Proposed Development in 2023, with one sighting of three individuals (Gavin & Doherty Geosolutions Ltd, 2023b). There was also an additional harbour porpoise sighted during the hydrographic and seismic operations in 2024 (Mizen Archaeology, 2024). These data suggest that harbour porpoises occur regularly throughout the study areas.

DENSITY/ABUNDANCE

4.2.2.8 Harbour porpoises were the most frequently recorded marine mammal species during site-specific DAS. The highest mean corrected density estimate was from the 2018-2020 DAS, and comprised 0.38 animals/km^2. Site-specific DAS confirmed the presence of harbour porpoise within the Study Area year-round, although abundance and density was higher in summer months (HiDef, 2020a; Refer to Section 6.2 in Annex H of this document), which has been confirmed by several other studies in this region (Berrow *et al.,* 2008; Rogan *et al*., 2018). The most recent large-scale surveys conducted were Small Cetacean Abundance in the North Sea IV (SCANS-IV) in 2022 which estimate an abundance of 9,773 animals and a density of 0.2803 animals/km^2 within block CS-D which encompasses the Irish Sea (Gilles *et al*., 2023).

SEASONALITY

4.2.2.9 During the ObSERVE surveys, adult harbour porpoises were sighted with calves in many coastal areas around Ireland, including within the western Irish Sea (Rogan *et al.,* 2018a). Berrow *et al.* (2011) estimated that, of all individuals recorded, the proportion of calves recorded in inshore waters of the Irish Sea during July and August was 6%, which was similar to previous surveys in the same area (Berrow *et al.,* 2008). Therefore, inshore waters may be important as nursery habitats during summer months.

4.2.2.10 During the historic site-specific boat-based surveys, raw data showed that harbour porpoises were recorded in higher numbers during summer and autumn compared to the rest of the year (Cork Ecology, 2009, 2008 and 2007; Coveney Wildlife Consulting Ltd., 2005). These data suggest that harbour porpoise could be moving into inshore waters during the breeding season (summer) and mother-and-calf pairs may inhabit inshore waters during late summer and early autumn when calves are very young.

4.2.2.11 Similarly, the 2018 - 2020 site-specific DAS data found that the highest counts of harbour porpoises were recorded during the August surveys in 2018 and July surveys in 2019, therefore supporting the findings from the historic site-specific boat-based surveys.

4.2.2.12 For the 2023 - 2024 site-specific DAS, seasonal comparisons indicated higher abundance and densities during the summer months (April - September; mean: 121 individuals, mean: 0.18 animals per km²), compared to the winter months (October - March; mean: 91 individuals, 0.13 animals per km²). This seasonal pattern is consistent with the previous site-specific DAS. It is also consistent with known seasonal patterns of occurrence for small cetaceans in Irish waters, where summer conditions support higher presence and potential prey availability.

4.2.3 Bottlenose dolphin

ECOLOGY

4.2.3.1 Two different ecotypes of bottlenose dolphin occur commonly across Irish and UK waters: coastal ecotype and offshore ecotype (Berrow *et al.*, 2013; Wall *et al.*, 2013; Hague *et al.*, 2020). The coastal ecotype makes up resident populations in the Shannon Estuary, Republic of Ireland (Rogan *et al.*, 2018b), Cardigan Bay, Wales, and the Moray Firth, East Scotland year-round (Hague *et al.*, 2020). They have a varied diet consisting of whiting, blue whiting (*Micromesistius poutassou*), pollock (*Pollachius*), saithe (*Pollachius virens*), haddock (*Melanogrammus aeglefinus*), poor cod, European hake (*Merluccius merluccius*), horse mackerel (*Trachurus trachurus*), flatfish (*Pleuronectiformes*), pelagic squid (*Loligo spp.*), and octopus (*Octopus spp.*) (Hernandez-Milian *et al.*, 2011; 2015). Female bottlenose dolphins reach sexual maturity from six to 13 years old (Robinson *et al.*, 2017) and males from their tenth year (Harrison and Ridgway, 1971). Peak season for births in the Irish Sea is observed between May and November (Berrow *et al.*, 2010). The gestation period lasts for 12 months and females' average calving intervals are around three to five years (Harrison and Ridgway, 1971; Robinson *et al.*, 2017).

DISTRIBUTION AND OCCURRENCE

4.2.3.2 In Ireland, there are thought to be at least three distinct populations of bottlenose dolphin, as determined by genetic studies (Mirimin *et al.*, 2011). One of these populations is highly mobile and the same individuals have been recorded off all Irish coasts (O'Brien *et al.*, 2009). Comparison of images within bottlenose dolphin photographic identification (hereafter 'photo-ID') catalogues confirmed movement of individuals through prospective corridors linking designated Special Areas of Conservation (SACs) in the Moray Firth, Cardigan Bay and Shannon Estuary (Robinson *et al.*, 2012). There is increasing evidence (from sightings and genetic analysis) to suggest that an offshore ecotype of bottlenose dolphin exists in Irish waters (Mirimin *et al.*, 2011; Berrow *et al.*, 2013). Due to dedicated studies on coastal populations of bottlenose dolphin, there is greater knowledge on the coastal ecotype than the offshore ecotype (Hague *et al.*, 2020). Most coastal sightings around Ireland fall within 10 km from shore (O'Brien *et al.*, 2010; Robinson *et al.*, 2012). Although they have been observed throughout Irish waters year-round, their presence is much less pronounced in the western Irish Sea (Ó Cadhla *et al.*, 2004; Berrow *et al.*, 2010; Wall *et al.*, 2013; Rogan *et al.*, 2018a).

4.2.3.3 During the ObSERVE aerial surveys, bottlenose dolphins were the most frequently sighted cetacean species in Irish EEZ waters, with more than twice as many sightings during winter compared to summer (Rogan *et al.*, 2018a). Bottlenose dolphins were recorded in oceanic, neritic and coastal waters, however, there were very few sightings in the western Irish Sea (stratum 5) compared to other regions within the Irish EEZ. This suggests that the west and southwest of Ireland are likely to be more important in terms of the distribution of this species. This is supported by findings of the historic site-specific boat-based surveys, as no bottlenose dolphin were recorded. Bottlenose dolphins were recorded once (November 2019) during the 2018 - 2020 site-specific DAS. No bottlenose dolphins were recorded during the 2023 - 2024 or 2025 site-specific DAS. Seasonal differences in distribution suggest that bottlenose dolphins disperse into the Irish Sea during the winter, between October and March (Rogan *et al.*, 2018a). There was one sighting

of bottlenose dolphin during the hydrographic and seismic operations in 2024 (Mizen Archaeology, 2024).

DENSITY/ABUNDANCE

4.2.3.4 Bottlenose dolphins are widespread and abundant in Irish waters (Berrow *et al.*, 2010; Wall *et al.*, 2013). One group of bottlenose dolphins were recorded during the site-specific DAS, confirming their presence within the Marine Mammal Study Area (HiDef, 2020a; Refer to Section 6.2 in Annex H of this document). However, it was not possible to provide an abundance and/or density estimate for bottlenose dolphin from the site-specific DAS due to the low number of sightings across the survey period (only one sighting, in the 2018-2020 DAS; no further sightings in the 2023-2025 DAS as noted in Section 6.2 in Annex H of this document. Recent large-scale surveys include ObSERVE and SCANS-IV which have provided contrasting abundance and density estimates, with the ObSERVE surveys providing an abundance of 223 animals and a density estimate of 0.0201 animals/km^2 within stratum 5 (Rogan *et al.*, 2018) and SCANS-IV providing an estimated abundance of 8,199 animals and a density of 0.2352 animals/km^2 within block CS-D (Gilles *et al.*, 2023).

SEASONALITY

4.2.3.5 The seasonal distribution of bottlenose dolphin in Irish waters based on the ObSERVE aerial survey data suggests that this species moves inshore, into shallow coastal waters during warmer months, and into offshore, deeper waters during the winter months (Rogan *et al.*, 2018a). However, this pattern could be as a result of both the coastal and offshore ecotypes using these areas.

4.2.4 Risso's dolphin

ECOLOGY

4.2.4.1 Risso's dolphins predate on cephalopods, primarily squid and octopus (MacLeod *et al.*, 2014). Life history information is relatively limited for Risso's dolphins, but sexual maturity is thought to be reached at 8 to 10 years old for females and 10 to 12 years old for males (Baird, 2009). The gestation period is estimated at 13 to 14 months with a calving interval of 2.4 years. The calving season is unknown for Irish and UK waters, but the presence of young calves in some groups observed during cetacean surveys indicates that calving does occur in Irish waters (Wall *et al.*, 2013).

DISTRIBUTION AND OCCURRENCE

4.2.4.2 Risso's dolphin is frequently recorded in Irish waters, in all seasons, and in a variety of habitats. Around the coast of Ireland, sightings of this species are recorded in inshore waters but most are recorded in deeper waters over the continental shelf and slope (Rogan *et al.*, 2018a). In Irish waters, Risso's dolphin commonly occur in groups of between one and ten individuals (Rogan *et al.*, 2018a) which may benefit cooperative hunting through repeated associations between individuals, with some individuals staying together for long periods of time (Hartman *et al.*, 2008; Felce, 2013).

4.2.4.3 Within the Irish Sea, Risso's dolphin is the most commonly recorded dolphin species and there is an indication that presence in the Irish Sea has increased, which is likely a result of the increase in populations of several species of cephalopod (a key prey species, see Section 6.2.3.1) in the British Isles, attributed to climate change (Berrow *et al.*, 2010; Van der Kooij *et al.*, 2016). Coastal sightings are typical for this region, with the coastal waters off Wicklow and Wexford accounting for 41% of all inshore sightings of this species (Berrow *et al.*, 2010). Modelled density outputs

also indicate the coastal waters off Wexford, in southeast Ireland contain high densities of Risso's dolphins, as compared to elsewhere in the Irish Sea (Evans and Waggitt, 2023). Calves are often recorded closer to the coast suggesting that calving occurs within the warmer inshore waters. In addition, repeated sightings of the same individuals suggest some degree of site fidelity may occur. For example, photo-ID studies of Risso's dolphins from the eastern Irish Sea showed indications of residency of identified individuals to a particular region (Felce, 2013). It is thought that coastal sightings in the western Irish Sea are likely to represent a frequently sighted community often sighted near the Saltee Islands off County Wexford (Rogan *et al.*, 2018a).

4.2.4.4 Small numbers of Risso's dolphin, ranging from one to eight individuals, were recorded during the site-specific historic boat-based surveys although none were identified during the site-specific DAS (noting, however, that a number of marine mammals could only be identified as 'cetacean species').

DENSITY/ABUNDANCE

4.2.4.5 Risso's dolphin were not recorded during site-specific DAS (HiDef, 2020a; as noted in Section 6.2 of Annex H of this document, although six sightings of between one and eight individuals have been previously recorded during historic site-specific boat-based surveys carried out from 2000 to 2008 (Cork Ecology, 2007; 2009; 2010; Coveney Wildlife Consulting Ltd, 2003; 2004; 2005; Fulmar Ecological Services, 2006), confirming their presence within the Study Area. Sightings of Risso's dolphins have also been recorded during the recent ObSERVE and SCANS-IV surveys of the wider area (Gilles *et al.*, 2023; Rogan *et al.*, 2018). However, only one individual was recorded in stratum 5 during the ObSERVE surveys (Rogan *et al.*, 2018). SCANS-IV estimated an abundance of 75 animals and a density of 0.0022 animals/km^2 in block CS-D which is lower than estimates from the previous SCANS-III survey which estimated an abundance of 1,090 animals and a density of 0.031 animals/km^2 in block E (Hammond *et al.*, 2021).

SEASONALITY

4.2.4.6 There is reported seasonality in the patterns of occurrence of Risso's dolphin, with animals being sighted more frequently further offshore in continental shelf waters during winter months (October - May) (Reid *et al.*, 2003). This is corroborated by sighting records for Irish waters where Risso's dolphin have been reported around the coast of Ireland in all months of the year, although peak sightings occur between May and July suggesting a late spring inshore movement (Berrow *et al.*, 2010). Reid *et al.* (2003) reports that in the Irish Sea (in offshore waters) most sighting records were between July and September, and near-shore records off southwest Ireland were obtained primarily between May and August.

4.2.4.7 During the historic site-specific boat-based surveys, all sightings of Risso's dolphin were during the months of May, June, and July supporting the evidence above, that this species more commonly occurs inshore in the Irish Sea during the spring/summer months (Cork Ecology, 2009; Coveney Wildlife Consulting Ltd., 2003).

4.2.5 Short-Beaked common dolphin

ECOLOGY

4.2.5.1 Short-beaked common dolphin (hereafter 'common dolphin') prey on a variety of fish and cephalopod species including poor cod, goby (*Caragobius urolepis*), blue whiting, whiting, cephalopods (*Cephalopoda*), Atlantic herring, European sprat (*Sprattus sprattus*), and haddock (Brophy *et al.*, 2009). Recordings from bycaught individuals in the North East (NE) Atlantic show that the average age at sexual maturity was 8.2 years for females and 11.9 years for males (Murphy *et al.*, 2005; Murphy *et al.*, 2009; Murphy *et al.*, 2021). Considering common dolphins

are reported to live up to 30 years in the Northeast Atlantic and have an extended calving interval period of approximately four years, it is thought females could have up to four to five calves throughout their lifetime (Murphy *et al.*, 2009).

DISTRIBUTION AND OCCURRENCE

4.2.5.2 Common dolphins are found throughout the Atlantic seaboard of Europe, in the Western Channel and Irish Sea and often travels in large groups. This species commonly inhabits continental shelf waters and occurs along the shelf edge and in deep water, and is the second most frequently reported cetacean, after harbour porpoise, within Irish waters (Berrow *et al.*, 2010). Common dolphin may occur in both inshore and offshore waters in the western Irish Sea, although the distribution of this species is primarily around the coast of southern and western Ireland (Berrow *et al.*, 2010). Modelled density outputs suggest that densities of common dolphin in the Irish Sea are higher in central regions further from shore (Evans and Waggitt, 2023).

4.2.5.3 There was one individual common dolphin recorded during the historic site-specific boat-based surveys, in 2002 - 2003 (Coveney Wildlife Consulting Ltd., 2003). There was one sighting of common dolphin in 2024 during the hydrographic and seismic operations (Mizen Archaeology, 2024).

4.2.5.4 Within the Marine Mammal Study Area, during the 2018 - 2020 site-specific DAS, common dolphins were observed on two occasions: a group of three animals in November 2019 and a group of 18 animals in January 2020 (HiDef, 2020a).

4.2.5.5 During the 2023 - 2024 site-specific DAS, common dolphins were observed on six occasions in the Marine Mammal Study Area; including two occasions in the Array Area and 2 km buffer, with a total of 32 animals recorded across the survey period. During the 2025 site-specific DAS, common dolphins were observed on only one occasion: a group of 26 animals in the Extended Marine Mammal Study Area in June 2025.

4.2.5.6 In addition, a small number of unidentified cetaceans were reported which may have been common dolphin. Due to limited number of common dolphin sightings during the 2018 - 2020 and 2025 site-specific DAS, mean abundance and density are not presented.

DENSITY/ABUNDANCE

4.2.5.7 Common dolphins were recorded during the site-specific DAS, confirming their presence within the Marine Mammal Study Area (HiDef, 2020a; Section 6.2 of Annex H of this document. No density estimate could be calculated for common dolphin from the 2018-2020 DAS, however a mean density estimate of 0.03 animals/km^2 was calculated from 2023-2024 DAS. SCANS-IV estimated an abundance of 949 animals and a density of 0.0272 animals/km^2 in block CS-D (Gilles *et al.*, 2023).

SEASONALITY

4.2.5.8 The IWDG cetaceans sighting review reports that records from ferries show a notable increase in numbers in the southern Irish Sea in the autumn and a peak in inshore records during the month of August (Berrow *et al.*, 2010), and suggests that there may be an eastward movement along the south coast during autumn and winter.

4.2.5.9 For the 2023-2024 site-specific DAS, seasonal comparisons indicated higher abundance, and density estimates during the winter months (October - March; mean: 39 individuals, 0.06 animals per km²), compared to the summer months (April - September; mean: four individuals, 0.01 animals per km²).

4.2.5.10 While previous studies (Berrow *et al.*, 2010) reported a peak in inshore sightings along the south coast of Ireland in August, the observed peak in March indicate that this seasonal pattern was not reflected for the 2023-2024 site-specific DAS.

4.2.6 Minke whale

ECOLOGY

4.2.6.1 Minke whales are the most abundant baleen whale within Irish and UK waters and are most commonly sighted in shallow, shelf habitat over the summer months, which are important foraging habitats. Key prey species for minke whales include sandeel (*Ammodytes*), herring, sprat, mackerel (*Scomber scombrus*), and poor cod (*Trisopterus minutus*). Some individuals remain in coastal waters year-round; however, most migrate south during winter months to temperate offshore waters for breeding grounds. Individuals from the Northeast Atlantic population of minke whale are thought to reach sexual maturity between three-to-six years old, but some can take up to 13 years to reach physical maturity (Olsen and Sunde, 2002). The gestation period lasts for 10 months, and the calving interval lasts at least one-to-two years (Christiansen *et al.*, 2014).

DISTRIBUTION AND OCCURRENCE

4.2.6.2 Minke whale mostly inhabit continental shelf waters, occurring in depths of less than 200 m and can often be seen close to land. In Irish waters, the minke whale is widely distributed but is most commonly seen along the south coast and in localised patches in the central Irish Sea (Reid *et al.*, 2003; Rogan *et al.*, 2018a), with modelled density outputs indicating a similar pattern in distribution (Evans and Waggitt, 2023). There is a distinct seasonal distribution of minke whale with animals moving inshore during the summer months and offshore during winter. A review of all cetacean sighting and stranding records made by the IWDG through ISCOPE suggest that minke whale may also be occasionally present within the Marine Mammal Study Area (Berrow *et al.*, 2010). Most records from the NBDC for the western Irish Sea also show sightings off the coast of Dublin and to the north, and also off southeast Wexford (NBDC, 2023).

4.2.6.3 Minke whale was the second most frequently recorded species (after harbour porpoise) during inshore boat-based surveys of the Irish Sea (Berrow *et al.*, 2011). Observations of minke whale were made in Dublin Bay and waters to the north. There were no observations of minke whale in the survey area within which the Proposed Development is located (Berrow *et al.*, 2011).

4.2.6.4 During the historic site-specific boat-based surveys, minke whale was observed to the west of the ABWP1 (i.e. inshore) in Year 4 (Coveney Wildlife Consulting Ltd., 2004). There was one additional sighting of minke whale in 2024 during the hydrographic and seismic operations (Mizen Archaeology, 2024).

4.2.6.5 No minke whales were recorded during the 2018 - 2020 or 2023 - 2024 site-specific DAS. There was one minke whale recorded (July 2025) in the Extended Marine Mammal Study Area during the 2025 site-specific DAS.

DENSITY/ABUNDANCE

4.2.6.6 Minke whales were not recorded during the 2018-2020 or 2023-2024 site-specific DAS (HiDef, 2020a) however, a single individual was recorded in the Marine Mammal Study Area, but outside of the Array Area and 2km buffer, on one occasion during the 2025 site-specific DAS in July 2025. Sightings have also been recorded during the recent ObSERVE and SCANS-IV surveys, which cover the wider area (Gilles *et al.*, 2023; Rogan *et al.*, 2018). Furthermore, the ObSERVE surveys confirmed a higher presence of minke whale during the spring and summer months, whilst the species is expected to be largely absent in autumn and winter due to offshore movements during these months (Rogan *et al.*, 2018). The ObSERVE surveys estimated an abundance of 495

animals and a density of 0.045 animals/km2 in stratum 5 (Rogan *et al.*, 2018). SCANS-IV estimated an abundance of 477 animals and a density of 0.0137 animals/km^2 in block CS-D, which is lower than estimates from the previous SCANS-III survey which estimated an abundance of 603 animals and a density of 0.017 animals/km^2 in block E (Hammond *et al.*, 2021).

SEASONALITY

4.2.6.7 Little is known about the seasonal movements of minke whales in the Atlantic although data for tagged individuals in the western Atlantic suggests southward movement from feeding areas in Iceland in the autumn months (Reid *et al.*, 2003). There is a distinct seasonal distribution of minke whale with animals moving inshore during the summer months and offshore during winter.

4.2.6.8 In UK waters, most sightings have been made between May and September. During July and September, feeding aggregations can be observed in inshore areas (Reid *et al.*, 2003). The IWDG cetacean sightings review found that the number of sightings around Irish waters started to increase in April and May, peaking in August, and tapering off in late autumn and early winter (Berrow *et al.*, 2010). This pattern is also reflected in the Irish Sea where animals appear in the eastern Irish Sea from April to June (Berrow *et al.*, 2010). The coastal distribution in summer months and lower or lack of coastal sightings in winter suggests a seasonal offshore to inshore movement. Data from the ObSERVE aerial surveys of Irish waters found a high use of coastal waters during the summer months, particularly in the southwest of Ireland and Irish Sea and the predicted distribution suggests that the Irish Sea appeared to be unsuitable for minke whale in winter (Rogan *et al.*, 2018a).

4.3 Status of the species in the local/regional area

4.3.1.1 Under Annex IV of the Habitats Directive, all cetacean species are afforded strict protection wherever they occur within a Member State's territory, both inside and outside designated protected areas. These are termed European Protected Species. The conservation status of these Annex IV cetacean species is presented below.

4.3.2 Harbour porpoise

4.3.2.1 Harbour porpoise currently have an 'inadequate' conservation status in Ireland under Article 17 of the European Union (EU) Habitats Directive (NPWS, 2025). They are listed as Least Concern on the International Union for Conservation of Nature (IUCN) Red List. The current conservation status and short-term trends for harbour porpoise within UK waters is unfavourable-inadequate (JNCC *et al.*, 2026a).

4.3.2.2 As an Annex II species of the Habitats Directive, the designation of SACs is required as a component of their conservation. There are 36 SACs designated for harbour porpoise within the Marine Mammal MU Study Area (Refer to Sections 4.5.1.2 and 4.6.5 for additional detail), the closest of which is Blackwater Bank SAC, 19.8 km from the Array Area, followed by Lambay Island SAC, which is 62.9 km from the Array Area.

4.3.3 Bottlenose dolphin

4.3.3.1 Bottlenose dolphins currently have a 'favourable' conservation status in Ireland under Article 17 of the EU Habitats Directive (NPWS, 2025). They are listed as Least Concern by the IUCN Red List. Bottlenose dolphins are classified as a Priority Species under the UK Post-2010 Biodiversity Framework. The current conservation status and short-term trends for bottlenose dolphin within UK waters are also favourable (JNCC et al., 2026b).

4.3.3.2 As bottlenose dolphins are also listed under Annex II of the EU Habitats Directive, SACs must be assigned to aid in the protection of this species. There are four SACs designated for bottlenose

dolphin within the Marine Mammal MU Study Area, the closest of which is Lleyn Peninsula and the Sarnau / Pen Llŷn a'r Sarnau SAC, 73.3 km from the Array Area, followed by Cardigan Bay / Bae Ceredigion SAC, which is 82.7 km from the Array Area, both of which are in UK waters.

4.3.4 Risso's dolphin

4.3.4.1 Risso's dolphin currently have a 'favourable' conservation status in Ireland under Article 17 of the EU Habitats Directive, with a stable population trend (NPWS, 2025). In 2018, Risso's dolphins were updated from Data Deficient to Least Concern on the IUCN Red List. The current conservation status and short-term trends for Risso's dolphin within UK waters is also favourable (JNCC *et al.*, 2026c). As Risso's dolphin is not an Annex II species under the Habitats Directive, there are no SACs for Risso's dolphin within either the Marine Mammal or MU Study Area. A Marine Protected Area (MPA) has been designated in North-east Lewis, Scotland due to the high numbers of Risso's dolphins that occur in these waters year-round. Consequently, it has been suggested that this MPA provides essential foraging grounds, as well as being important for breeding, nursing, and raising young (NatureScot, 2020a). The MPA does not overlap with the Marine Mammal Study Area but is within the MU Study Area.

4.3.5 Short-Beaked common dolphin

4.3.5.1 Common dolphins currently have a 'favourable' conservation status in Ireland under Article 17 of the EU Habitats Directive with a stable population trend (NPWS, 2025). They are classed as Least Concern on the IUCN Red List. The current conservation status and short-term trends for common dolphin within UK waters is also favourable (JNCC *et al.*, 2026d). As common dolphin is not an Annex II species under the Habitats Directive, there are no SACs for common dolphin within either the Marine Mammal or MU Study Area. There are also no other MPA designations for common dolphin within either the Marine Mammal or MU Study Area.

4.3.6 Minke whale

4.3.6.1 Minke whale currently have a 'favourable' conservation status in Ireland under Article 17 EU Habitats Directive, with a stable population trend (NPWS, 2025). They are listed as Least Concern on the IUCN Red List. The current conservation status for minke whale within UK waters is unfavourable-inadequate (JNCC *et al.*, 2026e). As minke whale is not an Annex II species under the Habitats Directive, there are no SACs for minke whale within either the Marine Mammal or MU Study Area. There are two MPAs in Scotland that have minke whale as a feature: Sea of the Hebrides MPA, and Southern Trench MPA. Habitat modelling suggests that there are above-average densities of minke whale in the waters of both MPAs (NatureScot, 2020b; NatureScot, 2020c). The MPAs do not overlap with the Marine Mammal Study Area but are both within the MU Study Area.

4.4 Objective(s) of Survey

4.4.1.1 Information on the marine mammal species within the Marine Mammal Study Area and MU Study Areas was collected through a detailed desktop review of existing studies and datasets. Site-specific surveys were undertaken including data collected in support of Arklow Bank Wind Park 1 (ABWP1) and recent surveys were commissioned to inform the baseline for the Proposed Development.

4.4.1.2 Specifically, data were collated through a detailed desktop study of the existing resources available for marine mammals within the region, incorporating data from third-party organisations, to gain a historical perspective. Site-specific visual boat-based survey data collected for ABWP1 during post-consent monitoring (2000 - 2009) were used to provide further detail. Additional site-specific survey data from two years of site investigation surveys (2024) and digital aerial surveys

(March 2018 to- April 2020; August 2023 - June 2024; February - July 2025) were also included to inform the baseline.

4.4.1.3 The objective of those surveys is to provide a robust baseline characterisation of the marine mammal receptors, against which the risk assessment of the activity requiring derogation and the associated derogation licence application could be made. Separately, the surveys have also informed the assessment of likely significant effects of the Proposed Development in accordance with the requirements of the Environmental Impact Assessment and Appropriate Assessment processes.

4.5 Description of Survey Area

4.5.1.1 Marine mammals are highly mobile and differ in their foraging distances and seasonal distribution based on their ecology and behaviour; therefore, for the purposes of this Annex IV cetacean species baseline characterisation, three marine mammal study areas were defined:

- **Marine Mammal Study Area** (Figure 4): This area encompasses the Array Area, and Cable Corridor and Working Area of the Proposed Development, plus a 4 km corridor. The 4 km corridor extends around the Array Area, covering the area west of the Array Area towards the coast. This combined area is covered by the site-specific DAS conducted in 2018-2020 and 2023-2024;
- **Extended Marine Mammal Study Area** (Figure 4): This area encompasses the Array Area, and Cable Corridor and Working Area of the Proposed Development, plus an extended 10 km buffer zone extending around the Array Area and covering west of the Array Area to the coast. This combined area is covered by the site-specific DAS conducted May 2025 – July 2025;

4.5.1.2 **Marine Mammal MU Study Area** (Figure 4): The baseline characterisation considers marine mammal ecology, behaviour, abundance, and distribution within the appropriate species MU for cetaceans (IAMMWG, 2023). The marine mammal MU Study Area will enable consideration of the scale of movement and population structure for each species. The cetacean MU boundaries are based on the best understanding of the structure of biological populations and ecological differentiation within such populations, also considering political boundaries and the management of human activities rather than distinct cetacean populations. An MU may be smaller than what is believed to be a 'population' to reflect spatial differences in human activities and their management (Inter-Agency Marine Mammal Working Group (IAMMWG), 2023).

4.5.1.3 The Proposed Development is located within the following MUs for each species:

- Harbour porpoise (*Phocoena phocoena*) – Celtic and Irish Seas MU;
- Bottlenose dolphin (*Tursiops truncatus*) – Irish Sea MU;
- Risso's dolphin (*Grampus griseus*) – Celtic and Greater North Seas MU;
- Common dolphin (*Delphinus delphis*) – Celtic and Greater North Seas MU;
- Minke whale (*Balaenoptera acutorostrata*) – Celtic and Greater North Seas MU.

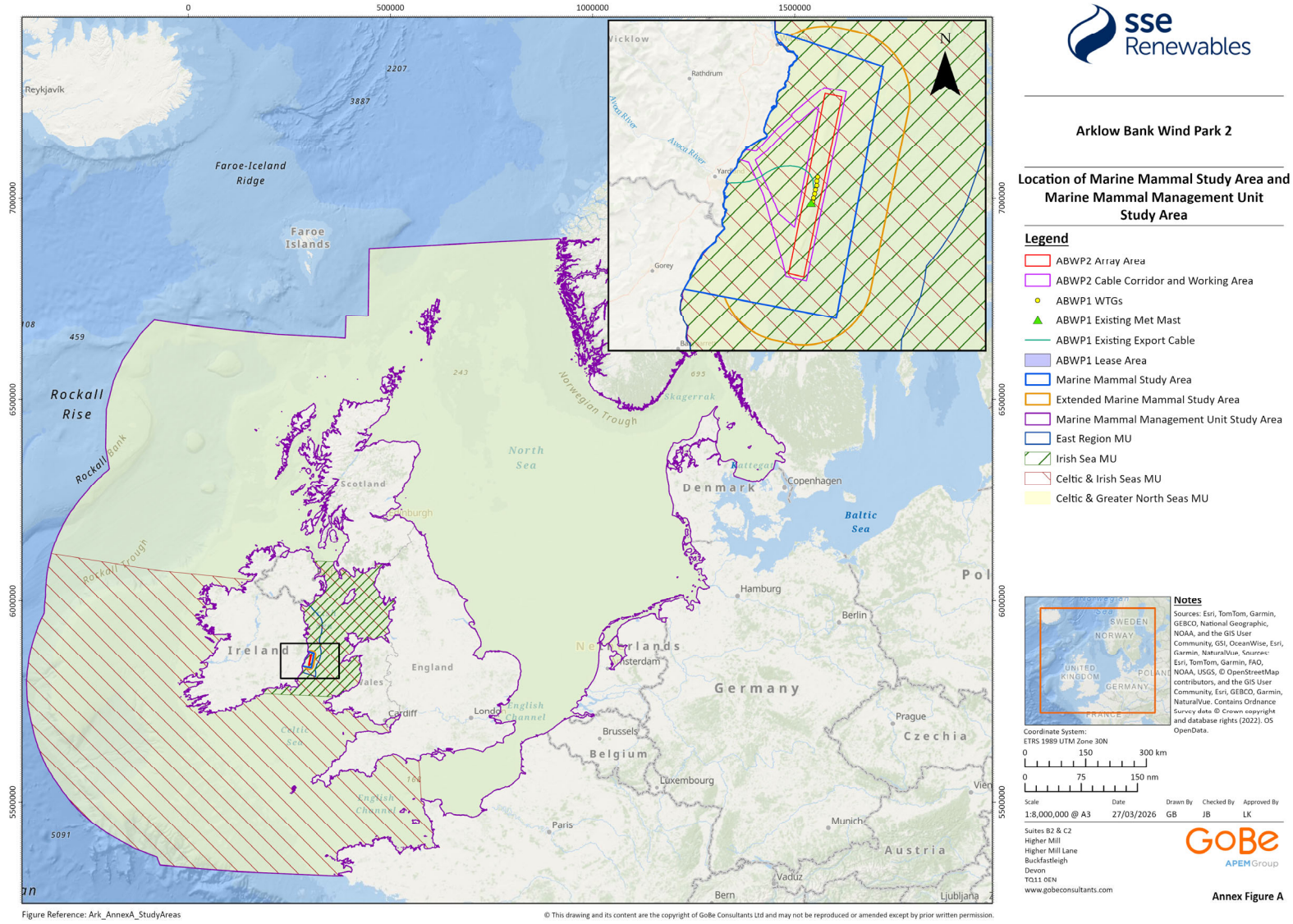

Figure 4: Marine Mammal Study Areas

4.6 Survey Methodology

4.6.1.1 This section outlines the survey methodology used to characterise the baseline environment in relation to Annex IV cetacean species. In accordance with the requirements of the NPWS, this provides the evidence as to how the methodology represents best practice and is appropriate to the objective and includes survey maps, details of timing, climate, equipment used and identify any uncertainties or difficulties encountered.

4.6.2 Site specific surveys

4.6.2.1 Site-specific surveys were commissioned to support the marine mammal baseline for the ABWP1 planning application. These were boat-based visual surveys (2000 - 2009) and a Passive Acoustic Monitoring (PAM) campaign (2002).

4.6.2.2 Additional surveys, in the form of DAS for the Proposed Development, were undertaken from 2018 - 2020, 2023 - 2024 and in 2025, to gather more recent data as part of site characterisation. The survey methodology of these site-specific surveys are reported below.

BOAT-BASED SURVEYS

4.6.2.3 The site-specific surveys for ABWP1 include historical boat-based visual surveys undertaken between June 2000 and June 2009, and PAM data obtained to the northwest of the ABWP1 WTGs. These acoustic data were collected for a total of 25 days during August and September 2002. Historical data has been considered as it is informative to trends in occurrence and distribution, although does not hold substantial weight in informing the baseline characterisation.

4.6.2.4 The surveys were conducted following an adaptation of the standard JNCC ESAS methodology using line transects (Webb and Durinck, 1992). Further details on the methodology can be found in the monitoring reports (Cork Ecology, 2010; 2009; 2007; Fulmar Ecological Services, 2006; Coveney Wildlife Consulting Ltd., 2005; 2004; 2003; 2002).

PASSIVE ACOUSTIC MONITORING (PAM) SURVEYS (2002)

4.6.2.5 Static PAM of harbour porpoise was conducted in 2002 using an acoustic data logger deployed to the northwest of the ABWP1 development area. The total number of days of deployment was 25, with data collected between 1st August 2002 and 1st September 2002.

SITE-SPECIFIC DIGITAL AERIAL SURVEY (DAS)

4.6.2.6 DAS data (March 2018 to February 2020 and April 2020; August 2023 to June 2024; and February 2025 to July 2025) are detailed in Annex G and Annex H of this document to inform the baseline characterisation for this Risk Assessment. During the 2018 to 2020 surveys an additional survey was conducted in April 2020 to account for a missed survey in April 2019. Across the 2018 to 2020 surveys, all calendar months were surveyed twice to capture seasonal seabird and marine mammal species presence across the Marine Mammal Study Area. Each calendar month was surveyed at least one more time through the further surveys in 2023 to 2025. Most surveys covered the Marine Mammal Study Area, however the surveys from May 2025 onwards include an extension of the existing buffer area to a 10 km buffer, thereby covering the Extended Marine Mammal Survey Area. However, it should be noted that the existing buffer applied in the Marine Mammal Study Area extends landwards to the coast and therefore exceeds the industry standard of a 4 km buffer, which is advised in guidance provided by Statutory Nature Conservation Bodies (SNCBs) in English and Scottish waters (SNCBs, 2022; NatureScot, 2023).

4.6.2.7 Abundance and design-based density estimates were derived by APEM Ltd as the competent experts, as per Section 1.3 and the Statement of Authority in relevant Annexes to this document.

DAS followed standard protocols, with high-resolution cameras mounted on aircraft capturing video imagery along pre-defined transects. Images were reviewed by trained analysts to identify animals to the lowest taxonomic level possible, with “unclassified” categories retained where species-level identification was not possible (e.g. small cetacean).

4.6.2.8 Statistically robust, design-based population estimates were calculated for all species identified within the survey areas. For each DAS, species-specific abundances and density estimates for the survey areas were produced, with upper and lower confidence limits and precision estimates in the form of a Coefficient of Variation (CV). The input data was comprised of locations of individuals contained within the observation data (i.e. as collected by HiDef) which were used to generate the raw counts for the analysis. Only individuals located within the survey areas were used to calculate the population estimates.

4.6.2.9 The raw counts were then divided by the number of transects to give the mean number of animals per replicate (I). Population estimates (N) for each survey month were then generated by multiplying the mean number of animals per replicate by the total number of replicates required to cover the entire survey areas (A): $N = I*A$

4.6.2.10 Each transect in the survey areas were treated as statistically independent. Non-parametric block bootstrap methods were used for variance estimation. A variability statistic was generated by re-sampling with replacement from the raw count data 1,000 times (Buckland *et al.*, 2004). To ensure that equal transect effort was sampled across each bootstrap iteration, transect ID was used as the sampling unit with replacement. The statistic was evaluated from each of these bootstrap samples and upper and lower 95% confidence intervals (CI) of these values were taken as the variability of the statistic over the population (Efron and Tibshirani, 1993).

4.6.2.11 A measure of precision was calculated using a Poisson precision. This produced a CV based on the relationship of the standard error to the mean (Thomas *et al.*, 2010). A target precision of ≤ 0.16 allows the detection of a population change of a factor as small as 2.

4.6.2.12 The density estimate is expressed as the average number of animals per km^2 in the survey areas. The population (abundance) estimate is expressed as the estimated number of animals within the survey areas. The upper and lower CI define the range that the population estimate falls within with 95% certainty. The CV is a measure of the precision of the population and density estimates. Data with low sighting numbers were included in the calculations, therefore a lower confidence can be expected with a low number of individuals.

4.6.2.13 All analysis and data manipulation carried out by APEM was conducted in the R programming language (R Development Core Team, 2025) and non-parametric 95% confidence intervals were generated using the ‘boot’ library of function (Canty and Ripley, 2021). Survey outputs were summarised at the individual level and across temporal groupings.

4.6.2.14 For the 2023 - 2024 dataset, averages were calculated by year (2023 and 2024) and by season (Summer: April - September; Winter: October - March). This breakdown was undertaken to account for potential seasonal variation in species occurrence and detectability, and to provide a more robust basis for comparison with other datasets and published literature. Grouping in this way also reduces the influence of outlier survey months with very low sightings, thereby strengthening interpretation of longer-term patterns. Seasonal trends were not calculated for the 2025 surveys due to the limited number of months surveyed.

4.6.3 SCANS Surveys

4.6.3.1 The ‘Small Cetaceans in European Atlantic waters and the North Sea’ or SCANS surveys (Hammond *et al.*, 2021; Lacey *et al.*, 2022; Gilles *et al.*, 2023; Gilles *et al.*, 2025) are robust large-scale aerial and vessel-based surveys which provide estimates of cetacean abundance and distribution across the European Atlantic using aerial and boat-based surveys. These surveys

were carried out during the summer months in 1994 (SCANS-I), 2005/07 (SCANS-II), 2016 (SCANS III; Hammond *et al.*, 2017; 2021; Lacey *et al.*, 2022), and the most recent survey, SCANS-IV, was completed in 2022 (Gilles *et al.*, 2023; 2025).

4.6.3.2 The Marine Mammal Study Area sits within SCANS-IV block CS-D and SCANS-III block E, both of which were surveyed by air. Although these blocks are commonly used, they have no biological significance; rather, they are logistical considerations with respect to carrying out the surveys. Nonetheless, for each block, a density estimate is calculated for those cetacean species that have been recorded in sufficient numbers, which can be used to give a broadscale density estimate relating to the Marine Mammal Study Area and the surrounding area.

4.6.4 ObSERVE Programme

4.6.4.1 The ObSERVE programme consists of aerial surveys to investigate the occurrence, distribution and abundance of key marine species in Irish waters, with a focus on marine mammals. Surveys were conducted in the summers of 2015 and 2016 and the winters of 2015-2016 and 2016-2017 in offshore waters around Ireland (Rogan *et al.,* 2018). The Proposed Development is located within ObSERVE Stratum 5. However, the site-specific surveys provide much finer spatial and temporal resolution appropriate for the detailed analysis.

4.6.5 Cetacean Management Units

4.6.5.1 The cetacean MU boundaries are based on the best understanding of the structure of biological populations and ecological differentiation within such populations, also considering political boundaries and the management of human activities rather than distinct cetacean populations. An MU may be smaller than what is believed to be a 'population' to reflect spatial differences in human activities and their management (Inter-Agency Marine Mammal Working Group (IAMMWG), 2023).

4.6.5.2 For some species, these MUs can cover large areas, as is the case for minke whale, which has an MU comprising the Celtic Sea and Greater North Sea. Alternatively, MUs can be broken down into smaller areas, such as for harbour porpoise, which reflects the much higher density of this species in Irish and UK waters.

4.7 Survey Results

4.7.1.1 Survey results, including where relevant, raw data, processed or aggregated data, and negative results, are provided in Annex G and Annex H to this document.

4.8 Population Size Class Assessment

4.8.1 Modelling Summary

4.8.1.1 Foundation installation activities such as monopile piling or drilling, or a combination of both (drive-drill-drive) leads to elevations in underwater noise and vibration, which can in turn lead to disturbance effects on marine mammals.

4.8.1.2 Underwater noise modelling for WTG and OSP foundation impact piling was undertaken at five representative locations covering the extents of the Proposed Development as presented in Annex K of this document. The locations were chosen to give the greatest geographical spread to maximise the potential impact ranges to the north and the south of the site. The modelled piling parameters are:

- 11 m monopile foundations at the North (N), Central (C) and Southwest (SW) WTG locations, installed with a maximum blow energy of 3,500 kJ; and

- 14 m monopile foundations at the North OSP (N-OSP) and South OSP (S-OSP) locations, installed with a maximum blow energy of 3,500 kJ.

4.8.1.3 All modelling results (available in Section 4 in Annex K of this document) are presented for the extended ramp-up mitigation scenario, which has been committed to by the Applicant. These results have been summarised in the following sections.

4.8.2 PTS (auditory injury) and TTS

4.8.2.1 The instantaneous and cumulative (over 24 hours) PTS and TTS-onset impact ranges have been determined using underwater noise modelling of the thresholds presented by Southall *et al.* (2019) (as described in detail in Section 3 of Annex K of this document). The calculated PTS- and TTS-onset impact ranges represent the minimum starting distances from the piling location for animals to escape and prevent them from receiving a dose higher than the threshold. Further information on the modelling approach and the methods used the calculate PTS and TTS-onset impact ranges is provided in Section 11.7 of Annex E of this document).

4.8.2.2 The number of individuals that may be affected by PTS was quantified by multiplying the impact-onset area by the density estimates for each species. This has been presented as an absolute number and as a proportion of the reference population. The animal density per km^2 taken forward within this assessment follows the approach used within Annex E and Annex F of this document. Of note is two density estimates are presented for bottlenose dolphins (Table 4-1 and Table 4-3 and in Annex E of this document) to reflect the substantial regional variation observed across survey years and areas. Including both values provides important context, as bottlenose dolphin densities can differ drastically, which in turn influences how abundance estimates are interpreted.

4.8.2.3 No assessment of the number of animals is given for TTS-onset because there are no thresholds to determine a biologically significant effect from TTS-onset. However, TTS ranges have been presented as they may result in disturbance in marine mammals.

Table 4-1: PTS-onset from pile driving at the all locations based on the extended ramp-up mitigation scenario

Species	Piling Location	Density[4] (animals/km^2)	Area (km^2)	Maximum range (m)	Number of animals[5]	% of reference population
Instantaneous PTS-onset (unweighted SPL_{peak})						
Harbour porpoise	N WTG	0.38	1.0	580	<1	<0.01
	C WTG		1.3	680		
	SW WTG		0.9	580		
	N-OSP		0.8	520		
	S-OSP		0.4	380		
Bottlenose dolphin	WTG (N, C and SW) OSP (N and S)	0.0201	<0.01	<50	<1	<0.01
		0.2352	<0.01	<50	<1	<0.01
Risso's dolphin		0.031	<0.01	<50	<1	<0.01

[4] The density presented for each marine mammal receptor represents the highest available density estimate, to provide the worst-case scenario results.

[5] **The predicted number of individuals that could be within the area of PTS-onset (both instantaneous and cumulative) from pile driving is fewer than one animal for all species assessed, when multiplying the density estimate by the area of PTS-onset. However, this does not take into account the avoidance and deterrent-based mitigation measures committed to by the Applicant. The maximum PTS-onset ranges for all species falls within the 1,000 m R_{safe} distance, which will be fully mitigated through the use of an ADD, alongside monitoring (visual or acoustic) to confirm deterrence of all animals beyond the 1,000 m R_{safe} distance. Therefore, the extended ramp-up mitigation and other mitigation measures will ensure that all marine mammals are displaced from the area where PTS could occur, consequently no animals are expected to experience PTS.*

Common dolphin		0.0272	<0.01	<50	<1	<0.01
Minke whale	WTG (N and SW) OSP (N and S)	0.045	<0.01	50	<1	<0.01
	C WTG		<0.01	60		
Cumulative PTS-onset (weighted SEL_{cum})						
Harbour porpoise	WTG (N, C and SW) OSP (N and S)	0.38	<0.01	<50	<1	<0.01
Bottlenose dolphin	WTG (N, C and SW) OSP (N and S)	0.2352	<0.01	<50	<1	<0.01
		0.0201	<0.01	<50	<1	<0.01
Risso's dolphin		0.031	<0.01	<50	<1	<0.01
Common dolphin		0.0272	<0.01	<50	<1	<0.01
Minke whale	N WTG	0.045	0.04	170	<1	<0.01
	C WTG		0.58	870		
	SW WTG		0.08	330		
	N-OSP		0.02	120		
	S-OSP		<0.01	70		

Table 4-2: TTS-onset from pile driving at WTG and OSP locations based on the extended ramp-up mitigation scenario

Species	Impact	Piling location				
		N-WTG	C-WTG	SW-WTG	N-OSP	S-OSP
Instantaneous TTS-onset (unweighted SPL_{peak})						
Harbour porpoise (VHF cetacean)	Area (km^2)	4.9	5.8	4.6	3.8	1.7
	Maximum range (m)	1,400	1,600	1,400	1,200	880
Bottlenose dolphin, Risso's dolphin, common dolphin (HF cetacean)	Area (km^2)	<0.01	<0.01	<0.01	<0.01	<0.01
	Maximum range (m)	<50	<50	<50	<50	<50
Minke whale (LF cetacean)	Area (km^2)	0.05	0.06	0.04	0.04	0.02
	Maximum range (m)	120	140	120	110	80
Cumulative TTS-Onset (weighted SEL_{cum})						
Harbour porpoise (VHF cetacean)	Area (km^2)	690	1,100	1,100	570	670
	Maximum range (m)	25,000	30,000	29,000	24,000	24,000
Bottlenose dolphin, Risso's dolphin, common dolphin (HF cetacean)	Area (km^2)	<0.01	<0.01	<0.01	<0.01	<0.01
	Maximum range (m)	<50	<50	<50	<50	<50
Minke whale (LF cetacean)	Area (km^2)	2,100	3,200	2,900	1,600	1,100
	Maximum range (m)	44,000	51,000	50,000	41,000	33,000

4.8.2.4 As presented in Table 4-1, this impact is calculated to occur in less than one individual prior to mitigation, which equates to a very small proportion of the population affected (<0.01%). However, with the implementation of the mitigation measures which involves the establishment of an R_{safe} of 1000 m, in practice there will be no cetaceans exposed to noise that could induce PTS-onset. The impact ranges for TTS, particularly cumulative TTS, are notably higher than for PTS, which would lead to a greater number of animals being exposed to noise at levels that could induce TTS-onset.

4.8.2.5 Full details on PTS and TTS-onset impact ranges from pile driving for each marine mammal species at each of proposed locations are provided in Table 11.18 and Section 11.7.4 in Annex E to this document

4.8.3 Behavioural responses

4.8.3.1 Behavioural responses to underwater noise can vary greatly, both within and between species. A species-specific approach has been taken to determine the range over which behavioural responses may occur, using approaches available in the published literature.

4.8.3.2 A species-specific dose-response approach was used for this assessment of disturbance to harbour porpoise from underwater noise during pile driving. In the absence of species-specific dose-response data for dolphins or minke whales, and given that the application of the harbour porpoise dose-response curve (Graham *et al.,* 2017) is considered over precautionary when considering observed responses of other cetacean species (e.g. Fernandez-Betelu *et al.*, 2021; Kastelein *et al.*, 2006; Stone *et al.*, 2017), the NMFS Level B harassment thresholds for strong disturbance have been used for dolphins and minke whales in this assessment. It should be noted that Level B distances are not species specific. The maximum distances modelled for Level B harassment are:

- 22,000 m for the installation of an 11 m monopile at the N WTG location.
- 26,000 m for the installation of an 11 m monopile at the C WTG location.
- 24,000 m for the installation of an 11 m monopile at the SW WTG location.

4.8.3.3 The number of individuals of each marine mammal species predicted to experience behavioural disturbance as a result of pile driving is presented in Table 4-3, alongside the proportion of the respective reference population. The predictions for each of the modelling locations are presented separately. Disturbance from concurrent piling for the Proposed Development is not relevant and has not been assessed as piling will be limited to one installation per day. The animal density per km^2 taken forward within this assessment follows the approach used which is included in Annex E and Annex F of this document.

4.8.3.4 To note, the use of the Level B harassment threshold to determine disturbance distance is likely over-precautionary. JNCC (2025b) have published Effective Deterrent Ranges (EDRs) for harbour porpoise from noise-producing activities including piling. EDRs provide an empirically-derived estimate of the spatial extent over which the bulk of the disturbance response by harbour porpoises will occur, though they do not correspond to complete avoidance and may overestimate the distances at which effects are consistently observed (JNCC, 2025b; JNCC, 2020). For monopile installation without noise abatement systems, reported EDRs vary, with most studies indicating ranges of 15–20 km, with a weighted average of 17.4 km based on 14 studies (Brown *et al*., 2025). A recent study included in the Brown *et al.* (2025) review was from Moray West, which observed an EDR of 9.4 km, highlighting that the 20 km EDR recommended by JNCC is precautionary. To note, the approach taken by JNCC (2025b) to calculating EDRs is precautionary as they represent the maximum disturbance response typically recorded at the start of the piling campaign. The disturbance distance of harbour porpoise is predicted to decrease over the duration of the piling campaign, as evidence by Graham *et al*. (2019).

Table 4-3: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population

Species	Density	Impact	Piling Location				
			N WTG 11 m	C WTG 11 m	SW WTG 11 m	N-OSP 11 m	S-OSP 11 m
Harbour porpoise	0.38	#	1,456	1,908	1,753	1,270	1,109
		%	2.33	3.05	2.80	2.03	1.77
Common dolphin	0.0272	#	21	30	30	18	16
		%	0.02	0.03	0.03	0.02	0.02
Bottlenose dolphin	0.0201	#	16	23	23	14	12
		%	5.46	7.85	7.85	4.78	4.10
	0.2352	#	179	259	259	153	132
		%	61.09	88.40	88.40	52.22	45.05
		%*	2.15	3.12	3.12	1.84	1.59
Risso's dolphin	0.031	#	24	35	35	21	18
		%	0.20	0.29	0.29	0.17	0.15
Minke whale	0.045	#	35	50	50	30	26
		%	0.17	0.25	0.25	0.15	0.13

Source: SCANS-IV density estimates / SCANS-III density estimates / ObSERVE estimates used in calculations from Gilles *et al.* (2023), Hammond *et al.* (2021) and Rogan *et al.* (2018).

*Secondary bottlenose dolphin reference abundance from SCANS-IV (Gilles *et al.*, 2023), provides estimates from Block CS-D at 8,326 rather than 293 from MU populations in IAMMWG (2023) to provide more realistic populations relevant to the Proposed Activities.

4.8.3.5 The population modelling provided in Annex L of this document (which comprises Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling), was conducted to determine whether the level of disturbance from foundation installation (specifically pile-driving) is expected to result in population-level impacts. The results of the population modelling showed that there is no significant effect of disturbance from pile driving at the Proposed Development to the populations of harbour porpoise, bottlenose dolphin, and minke whale (i.e. the species for which iPCoD modelling is possible to undertake). For harbour porpoise, the impacted population is predicted to continue at a stable trajectory never falling below 99.89% as compared to the mean un-impacted population. For bottlenose dolphin, the mean impacted population size initially decreases very slightly as compared to the mean un-impacted population size in response to piling. However, shortly after piling the impacted population continues on the same, stable trajectory never falling below 98.09% of the mean un-impacted population size. Furthermore, for minke whale, impacted population is predicted to continue at a stable trajectory at exactly the same size as the un-impacted population.

4.8.3.6 It is highlighted that the population modelling (provided in Annex L of this document) was undertaken at the time of submission of the planning application (June 2024) and so is based on Project Design Option parameters that have since been refined further (i.e. the maximum hammer energy has been reduced, there are fewer WTGs and associated piles required etc.). Specifically, the modelling was conducted under the original ramp-up mitigation scenario, which doesn't have an extended ramp up and thus has a higher maximum energy of 6000 kJ. The revised piling parameters remain within the overall range assessed in the iPCoD modelling and thus the modelling outputs are valid for the purposes of assessment and are considered precautionary, as they are based on a scenario that reflects equal or greater impact potential than the activities which are described in Section 3 and the design which is detailed in Paragraph 4.4.2.14 *et seq.* of Annex A of this document.

5 Evidence to support the Derogation Tests

5.1 Test 1 - Reason for Derogation

5.1.1 Overview

5.1.1.1 Where there is no satisfactory alternative and the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range, a derogation licence can only be granted if it meets a specific purpose. Namely, one of the following purposes:

"a) In the interests of protecting wild fauna and flora and conserving natural habitats;

b) To prevent serious damage, in particular crops, livestock, forests, fisheries and water and other types of property;

c) In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment;

d) For the purpose of research and education, of repopulating and re-introducing these species and for the breeding operations necessary for these purposes, including the artificial propagation of plants; or

e) To allow, under strictly supervised conditions, on a selective basis and to a limited extent, the taking or keeping of certain specimens of the species to the extent specified therein, which are referred to in the First Schedule."

5.1.1.2 The reason for proceeding with the derogation that is being sought pursuant to Regulation 54 of the Habitats Regulations, is that the Proposed Development is considered to be: 'In the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment'.

5.1.1.3 This is in accordance with Article 16f of Directive (EU) 2023/2413 which states that:

"By 21 February 2024, until climate neutrality is achieved, Member States shall ensure that, in the permit-granting procedure, the planning, construction and operation of renewable energy plants, the connection of such plants to the grid, the related grid itself, and storage assets are presumed as being in the overriding public interest and serving public health and safety when balancing legal interests in individual cases for the purposes of Article 6(4) and Article 16(1), point (c), of Directive 92/43/EEC, Article 4(7) of Directive 2000/60/EC and Article 9(1), point (a), of Directive 2009/147/EC. Member States may, in duly justified and specific circumstances, restrict the application of this Article to certain parts of their territory, to certain types of technology or to projects with certain technical characteristics in accordance with the priorities set out in their integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999. Member States shall inform the Commission of such restrictions, together with the reasons therefor."

5.1.1.4 Article 16F of Directive (EU) 2023/2413 has been transposed in Ireland through Regulation 43D of the Habitats Regulations.

5.1.1.5 This section explains the need and benefits of the Proposed Development in terms of its contribution to the decarbonisation of Irish energy to achieve a climate neutral economy, and also in helping to achieve the relevant obligations in relation to carbon, climate mitigation and specifically offshore renewables. There is a compelling and urgent need for renewable energy development in Ireland and this information explains the scale of that need and why the important contribution that will be made by the Proposed Development should be given very substantial weight in decision making for the derogation that is being sought. The Proposed Development, once constructed, will represent a critical proportion of the State's renewable energy capacity, and it will contribute to achieving the Government of Ireland's target of at least 5GW of offshore wind target by 2030. Indeed, it will produce approximately 800 MW of renewable energy.

5.1.1.6 The Applicant concludes that the benefit delivered by the Proposed Development to decarbonisation, security of supply and contribution towards achieving the national climate obligations should be considered as demonstrating imperative reasons of overriding public interest and thus support of granting of the derogation that is required for the Proposed Development.

5.1.2 Legislative /Obligations

RENEWABLE ENERGY DIRECTIVE

5.1.2.1 Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652, also referred to as RED III states the following in Article 16f:

"By 21 February 2024, until climate neutrality is achieved, Member States shall ensure that, in the permit-granting procedure, the planning, construction and operation of renewable energy plants, the connection of such plants to the grid, the related grid itself, and storage assets are presumed as being in the overriding public interest and serving public health and safety when balancing legal interests in individual cases for the purposes of Article 6(4) and Article 16(1), point (c), of Directive 92/43/EEC, Article 4(7) of Directive 2000/60/EC and Article 9(1), point (a), of Directive 2009/147/EC. Member States may, in duly justified and specific circumstances, restrict the application of this Article to certain parts of their territory, to certain types of technology or to projects with certain technical characteristics in accordance with the priorities set out in their integrated national energy and climate plans submitted pursuant to Articles 3 and 14 of Regulation (EU) 2018/1999. Member States shall inform the Commission of such restrictions, together with the reasons therefor."

5.1.2.2 Further, Recital 44 of REDIII states:

"For the purposes of the relevant Union environmental law, in the necessary case-by-case assessments to ascertain whether a renewable energy plant, the connection of that plant to the grid, the related grid itself or storage assets are of overriding public interest in a particular case, Member States should presume those renewable energy plants and their related infrastructure to be of overriding public interest and serving public health and safety, except where there is clear evidence that those projects have significant adverse effects on the environment which cannot be mitigated or compensated for, or where Member States decide to restrict the application of that presumption in duly justified and specific circumstances, such as reasons related to national defence. Considering such renewable energy plants to be of overriding public interest and serving public health and safety would allow such projects to benefit from a simplified assessment."

5.1.2.3 Additionally, the EC Guidance (2022) states that:

"In order to facilitate the use of existing flexibilities in EU environmental legislation, Member States should clarify in their national legislation that the planning, construction and operation of plants for

the production of energy from renewable sources, their connection to the grid and the related grid itself are presumed as being in the overriding public interest and in the interest of public safety, in view of the legislative proposal amending and strengthening the provisions of Directive (EU) 2018/2001 related to administrative procedures. As such, they should qualify for the most favourable procedure available in their planning and permit-granting procedures"

EUROPEAN COMMUNITIES (BIRDS AND NATURAL HABITATS) Regulations 2011 (AS AMENDED)

5.1.2.4 The Habitats Regulations transpose Article 16f of REDIII through Regulation 43D as follows:

"Notwithstanding these Regulations and the Wildlife Act 1976, for the purposes of Article 16f of the Renewable Energy Directive, until climate neutrality is achieved, where a renewable energy project or any part thereof consists of—

(a) the planning, construction and operation of a renewable energy plant,
(b) the connection of such a plant to the grid,
(c) the grid referred to in paragraph (b), or
(d) storage assets,
such a renewable energy project is presumed as—
(i) being in the overriding public interest, and
(ii) serving public health and safety,

when balancing legal interests in individual cases for the purposes of
(I) Article 6(4) and point (c) of Article 16(1) of the Habitats Directive, and
(II) point (a) of Article 9(1) of the Birds Directive."

CLIMATE ACTION AND LOW CARBON DEVELOPMENT (AMENDMENT) ACT 2021

5.1.2.5 In July 2021, Ireland enacted the Climate Action and Low Carbon Development (Amendment) Act. The Act binds Ireland to achieve net zero emissions by 2050 and commits to achieving 51% reduction in GHG emissions by 2030.

5.1.2.6 It also provides for a governance framework including a new system of sectoral emissions ceilings and carbon budgets. The electricity sector needs to achieve a 75% reduction in emissions by 2030 in comparison to 2018 levels. The sectoral emissions ceiling for the electricity sector in 2030 is 3 $MtCO_{2eq}$. This is the most ambitious sectoral carbon budget. It is critical that large-scale offshore wind projects are facilitated if Ireland is to meet this target.

5.1.2.7 The critical elements of Ireland's national climate change law are:

- A national climate objective to pursue and achieve no later than 2050 the transition to a climate resilient, biodiversity-rich, environmentally sustainable, and climate-neutral economy.
- The Climate Change Advisory Council has a critical role in assessing and advising on how Ireland is making the transition as described above and this includes proposing 5-yearly carbon budgets.
- The Government must adopt carbon budgets that are consistent with the Paris agreement and other international obligations.
- The first two five-year carbon budgets (2021–2025 and 2026–2030) proposed by the Climate Change Advisory Council should equate to a total reduction of 51% over the period to 2030, relative to a baseline of 2018.
- The Government will determine, following consultation, how to apply the carbon budget across the relevant sectors, and what each sector will contribute in a given five-year period
- Actions for each sector will be detailed in the Climate Action Plan which must be updated annually.

5.1.2.8 Under section 15(1) a relevant body is required to, in so far as practicable, perform its functions in a manner consistent with, (a) the most recent approved climate action plan, (b) the most recent approved national long term climate action strategy,(c) the most recent approved national adaptation framework and approved sectoral adaptation plans, (d) the furtherance of the national climate objective, and (e) the objective of mitigating greenhouse gas emissions and adapting to the effects of climate change in the State.

5.1.2.9 The total emissions allowed under each budget is set out below, as well as the average annual reduction for each 5-year period:

- 2021 – 2026: 295 Mt CO2eq. This represents an average reduction in emissions of 4.8% per annum for the first budget period;
- 2026 – 2030: 200 Mt CO2eq. This represents an average reduction in emissions of 8.3% per annum for the second budget period;
- 2031 – 2035 (provisional): 151 Mt CO2eq. This represents an average reduction in emissions of 3.5% per annum for the third provisional budget.
- 2031-2035 (proposed): 160 Mt CO2eq. This represents an average reduction in emissions of 6.3% per annum for the fourth proposed budget.
- 2036 – 2040 (proposed): 120 Mt CO2eq. This represents an average reduction in emissions of 6.3% per annum for the fourth proposed budget.

5.1.2.10 Specifically, the electricity sector has an emissions ceiling of 40 Mt CO_{2eq} between 2021 and 2025 and this is one of only three sectors, projected to achieve the target for the first carbon budget period via a projected 70% decrease in emissions by 2030 on 2018 levels. The emissions ceiling for 2026-2030 is 20 Mt CO_{2eq} with the Climate Change Advisory Council proposing further carbon budgets as follows (Climate Change Advisory Council, 2024):

- Carbon Budget 3 (CB3: 2031-2035) of 160 Mt CO2eq;
- Provisional Carbon Budget 4 (CB4: 2036-2040) of 120 Mt CO2eq.

5.1.2.11 Urgent implementation of all climate plans and policies, in addition to further new measures, are needed for Ireland to meet the 51% emissions reduction target and put Ireland on track for net zero by 2050. It has been estimated that the State could face a compliance cost of between €8 - 26 billion if it fails to achieve reductions in carbon emissions (Irish Fiscal Advisory Council and Climate Change Advisory Council, 2025). Delivery of the Proposed Development would make a positive contribution in reducing the state's possible liability in this regard.

5.1.2.12 It is noted that electricity generated from renewable energy has been identified (EPA, 2025b) as the largest contributor to potential GHG emissions reductions by 2030 with a projected reduction in emissions of 11.76Mt CO_{2eq}.

5.1.3 Policy Drivers

INTERNATIONAL

2030 EU CLIMATE AND ENERGY FRAMEWORK

5.1.3.1 The 2030 EU Climate and Energy Framework provides a framework for climate and energy policies in Europe. It was agreed by EU leaders in 2018. This framework seeks a 40% reduction in EU GHG emissions from 1990 levels and a greater contribution from renewable energy. This Framework aligns with the relevant obligations as outlined in REDIII and previously described.

5.1.3.2 The EU Governance of the Energy Union and Climate Action Regulation 2018/1999 sets the overall framework for the achievement of the EU climate and energy 2030 targets.

5.1.3.3 Ireland has prepared a National Energy and Climate Plan (NECP) 2021 to 2030 (as detailed below in Sections 5.1.3.26 - 5.1.3.28) to meet the requirements of the EU Governance of the Energy Union and Climate Action Regulation 2018/1999.

EUROPEAN GREEN DEAL AND FIT FOR 55

5.1.3.4 The European Green Deal (European Commission (EC)) was agreed in 2021 and is the EU growth strategy to transform Europe to a climate-neutral, fair and prosperous society with a modern resource efficient and competitive economy. It aims for no net emissions of greenhouse gases by 2050 with economic growth decoupled from resource use.

5.1.3.5 To achieve climate neutrality as per Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), the EU has committed to increasing the greenhouse gas emission reductions targets for 2030 to at least 55%. A key route to achieving this will be the development of an energy sector based significantly on renewable resources. The "Fit for 55" package of EU reforms puts in place new initiatives with the aim of ensuring that EU policies are in line with these new climate goals.

REPOWEREU

5.1.3.6 In response to the global energy market disruption caused by the Russian invasion of Ukraine in 2022, the EC published the REPowerEU Plan (EC, 2022). The Plan is aimed at ending the EU's dependence on Russian fossil fuels, tackling the climate crisis, and bringing about energy savings, diversifying energy supplies and accelerating the roll out of renewable energy. The Plan recognises the need to scale up and speed up the roll out of renewable energy projects. The Plan increases the headline 2030 EU renewable energy target to 42.5% with future ambition to reach 45%.

PARIS AGREEMENT

5.1.3.7 The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties including Ireland at the UN Climate Change Conference (COP21) in Paris, France, on 12th December 2015. It entered into force on 4th November 2016. Its overarching goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.”

5.1.3.8 Nationally Determined Contributions (NDCs) are at the heart of the Paris Agreement and the achievement of its long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement [Article 4, Para 2] requires each Party to prepare, communicate, and maintain successive NDCs that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.

NATIONAL

PROJECT IRELAND 2040 - NATIONAL PLANNING FRAMEWORK

5.1.3.9 Project Ireland 2040 - National Planning Framework (NPF), published in July 2018 (Department of Housing, Planning and Local Government and Department of Public Expenditure and Reform, 2018), is the primary articulation of spatial, planning and land use policy in Ireland. The purpose of the framework is to guide the sustainable growth of the country over the next 20+ years. The framework aims to direct new development toward areas of existing settlement, rather than allowing the continual expansion and sprawl of cities and towns.

5.1.3.10 In April 2025, the Government adopted the First Revision to the National Planning Framework (Department of Housing, Local Government and Heritage, 2025). The National Planning Framework is the Government's high level strategic plan for shaping the future growth and development of Ireland to the year 2040 with the revised NPF providing the basis for the review and updating of regional strategies and local authority development plans.

5.1.3.11 Similar to the previous NPF published in July 2018, the first revision to the NPF contains a specific section on renewable energy. The following National Policy Objectives are included:

"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a climate neutral economy by 2050". National Policy Objective 70.

"Support the development and upgrading of the national electricity grid infrastructure, including supporting the delivery of renewable electricity generating development". National Policy Objective 71.

NATIONAL DEVELOPMENT PLAN 2018 - 2027

5.1.3.12 The National Development Plan 2018 to 2027 (NDP) (Department of Public Expenditure and Reform, 2018), updated in 2025 (Department of Public Expenditure and Reform and Digitalisation, 2025), identifies strategic priorities for public capital investment in order to underpin the implementation of the NPF. It is a strategic priority of the NDP to have a new Renewable Electricity Support Scheme to support up to 4,500 Megawatt (MW) (i.e. 4.5 Gigawatt (GW)) of additional renewable electricity by 2030 (though it is worth noting that Ireland's onshore (4 GW), offshore (5 GW) and solar (8 GW) targets far exceed this target).

5.1.3.13 National Strategic Outcome 8 of the NDP is to transition to a low-carbon and climate-resilient society. To achieve this, the NDP recognises that Ireland's ambition must go further than a focus on achieving compliance with international commitments and recognises the importance of achieving a low-carbon, climate-resilient and environmentally sustainable economy and society.

MARINE PLANNING POLICY STATEMENT (MPPS)

5.1.3.14 Ireland's first Marine Planning Policy Statement was published in November 2019.

5.1.3.15 The MPPS was introduced on a non-statutory basis at the time and described the existing components of Ireland's marine planning system, outlining the vision for the future development of Ireland's marine planning system. The plan also set out the overarching policies and principles expected of statutory bodies with responsibilities in or impacting on the maritime area.

5.1.3.16 The MPPS recognises that the 'construction of wind turbines and associated development' is one of many development types within the foreshore development management. One of the overarching principles and high-level priorities outlined in the MPPS is as follows:

"Marine planning will facilitate Ireland's transition to a low carbon and climate resilient economy. Marine planning should ensure that developments in the marine environment consider as a matter of course ways to reduce the emission of greenhouse gases and also that they have due regard to the impacts of a changing climate. Marine planning should also support the realisation of relevant measures contained in the Government Plan to Tackle Climate Breakdown."

NATIONAL MARINE PLANNING FRAMEWORK

5.1.3.17 The National Marine Planning Framework (NMPF) was published in July 2021 (Department of Housing, Planning and Local Government, 2021). It contains overarching marine planning policies that are applicable to all proposals within Ireland's extensive maritime area. The NMPF

serves as a parallel to the National Planning Framework, as it sets out the Government's long-term planning objectives and priorities for the management of our seas over a 20-year time frame.

5.1.3.18 The main driver for the NMPF is the European Maritime Spatial Planning Directive. Public bodies are legally obliged to secure the objectives of the NMPF.

5.1.3.19 Section 13 of the NMPF relates to Offshore Renewable Energy and includes 11 planning policies, the following of which support the Proposed Development:

- ORE Policy 1 - Proposals that assist the State in meeting the Government's offshore renewable energy targets, including the target of achieving 5GW of capacity in offshore wind by 2030 and proposals that maximise the long-term shift from use of fossil fuels to renewable electricity energy, in line with decarbonisation targets, should be supported.
- ORE Policy 2 - Proposals must be consistent with national policy, including the OREDP and its successor. Relevant Projects designated pursuant to the Transition Protocol6 and those Projects that can objectively enable delivery on the Government's 2030 targets will be prioritised for assessment under the new consenting regime.

CLIMATE ACTION PLAN 2025

5.1.3.20 The Climate Action Plan 2025 (CAP25) is Ireland's most recent Climate Action Plan prepared under the Climate Act. It is integral to the National Development Plan 2021-2030 and sets out how Ireland can accelerate the actions required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development.

5.1.3.21 Ireland's statutory climate objective remains 51% reduction in emissions by 2030 (relative to the 2018 Levels) and climate neutrality by no later than 2050 in accordance with the Climate Act CAP25 forms part of the annual programme of measures required to deliver Ireland's carbon budgets and sectoral emission ceilings.

5.1.3.22 CAP25 was approved in April 2025 and represents the third prepared under the 2021 Act. It builds on the actions set out in previous plans including CAP23 and CAP24 and focuses on accelerating delivery in advance of Ireland's second carbon budget period (2026-2030). CAP25 is accompanied by a detailed Annex of Actions which assigns delivery responsibilities and timelines across all sectors to support compliance with Ireland's carbon budgets.

5.1.3.23 CAP25 continues to identify the electricity sector as central to emissions reduction and recognises the critical role of renewable energy, including offshore renewable energy, in decarbonising the electricity system and supporting wider economy-wide electrification. The plan confirms the continued role of the Offshore Wind Delivery Taskforce, established in CAP23, to oversee and coordinate the system-wide actions required to develop offshore wind generation in Ireland.

5.1.3.24 Chapter 11 of CAP25 sets out actions and milestones for renewable electricity generation across solar, onshore and offshore wind. It maintains the Government's objective of delivering at least 5GW of offshore wind capacity by 2030, alongside the overall target of supplying 80% of electricity demand from renewable sources by 2030, supported by continued expansion of renewable generation, reinforcement of the electricity grid, and delivery of offshore transmission and network infrastructure.

[6] The Transition Protocol, published alongside the General Scheme of the MPDM (as the Maritime Area Planning Act 2021 was then titled) in January 2020, provides guidance to the sector regarding the treatment of certain offshore wind projects ("Relevant Projects") in the context of the Maritime Area Planning Act 2021. The Protocol governs the approach for these projects and enables them to transition to the regime that was developed under the Maritime Area Planning (MAP) Act. ABWP2 was included as a Relevant Project under the Transition Protocol.

5.1.3.25 CAP25 reiterates that Ireland has a substantial offshore renewable energy resource, with offshore renewable energy identified as a key enabler of Ireland's, long term decarbonisation objectives and energy security, emphasising CAP24's offshore renewable opportunity estimate of 37GW. The Department of the Environment, Climate and Communications (DECC) commit to updating the plan every 12 months in a manner that is underpinned by consultation with key stakeholders.

IRELAND'S NATIONAL ENERGY AND CLIMATE PLAN 2021-2030

5.1.3.26 Ireland's National Energy and Climate Plan (NECP) pledges to increase electricity generated from renewable sources to 70%, of which there will be at least 3.5GW of offshore renewable energy. This has been revised upwards since the adoption of the plan in 2020 to 5 GW of offshore renewable energy. The NECP also supports the target of a 30% reduction in non-ETS greenhouse gas emissions by 2030 (from 2005 levels).

5.1.3.27 The NECP recognises that Ireland has one of the best offshore renewable energy resources in the world with a sea area of 900,000 square kilometres. Achieving the goals to decarbonise electricity will require significant investment, to build out relevant infrastructures and to expand capacity to integrate new renewable technologies such as offshore wind energy.

5.1.3.28 The NECP includes the assumption that the deployment of offshore wind capacity will grow from 2025 onwards, in line with assumptions from Ireland's 2019 Climate Action Plan, highlighting an urgent impetus to develop offshore wind energy to meet its climate targets.

OTHER RELEVANT NATIONAL POLICY DOCUMENTS

Other relevant policy documents are presented in Table 5-1 with additional detail in Annex M of this document (which is Chapter 2 of the EIAR for the Proposed Development).

Table 5-1: Other relevant policy documents

Policy Document	Year published	Comments
National Policy		
Offshore Renewable Energy Development Plan I (OREDP I) (Department of Communications, Climate Action and Environment, 2014)	2014	Ireland's first Offshore Renewable Energy Development Plan (OREDP) provided a framework for the sustainable development of Ireland's ORE resources, setting out key principles, policy actions and enablers for delivery of Ireland's significant potential in this area. The OREDP I is currently guiding the State's policy approach to achieving 5GW of ORE by 2030, mostly through fixed-bottom wind turbines in relatively shallow waters of up to 70 metres off the east and southeast coasts.
Ireland's Transition to a Low Carbon Energy Future 2015-2030 (The Energy White Paper) (Department of Communications, Energy and Natural Resources, 2015)	2015	The Energy White Paper sets out a framework to guide policy up to 2030. It sets out a framework for transforming Ireland's fossil fuel-based energy sector into a clean, low carbon system by 2050. It recognises that Ireland's seas offer significant potential for offshore wind.
Offshore Renewable Energy Development Plan I (OREDP I), Interim Review (Department of Communications, Climate Action and Environment, 2018)	2018	OREDP I identifies the opportunity for the sustainable development of Ireland's abundant offshore renewable energy resources. It sets out the clear principles, policy actions and enablers for the delivery of Ireland's potential in offshore renewable energy. Action 10 of the OREDP I recommends the support of early mover projects to stimulate the supply chain and act as a clear signal that Ireland is open for business.
South Coast Designated Maritime Area Plan (DMAP) (Department of Climate, Energy and the Environment, 2024)	2024	The South Coast DMAP is Ireland's first statutory DMAP identifying specific offshore areas off the south coast for future offshore wind development. It creates a plan-led framework to support renewable energy deployment in the Celtic Sea.
Shaping our Electricity Future (Version 1.1) (EirGrid Group, 2022)	2022	Shaping our Electricity Future presents a Roadmap of how Ireland can make the electricity grid ready so that 80% of Ireland's and Northern Ireland's electricity can come from renewable sources by 2030.
Future Framework for Offshore Renewable Energy 2025 Review (Department of Communications, Climate Action and Environment, 2025)	2025	The Future Framework 2025 Review, published in May 2025 captures ORE sectoral progress since 2024. The report provides a detailed progress update on each of the 29 actions under the Future Framework as well as an updated action plan for the coming year. Action 9 is of direct relevance to the Proposed Development and an ongoing commitment from the 2024 policy statement: Continue to support the consenting process for ORE projects including support of necessary environmental procedures.

Policy Document	Year published	Comments
Regional Policy		
Regional Spatial and Economic Strategy - Eastern Midlands Regional Assembly	2019	The Eastern and Midland Regional Assembly Regional Spatial and Economic Strategy a strategic plan and investment framework to shape the future development of the region, including County Wicklow, to 2031 and beyond. The Strategy sets out 16 Regional Strategic Outcomes including: • **Regional Strategic Outcome 9:** Support the Transition to Low Carbon and Clean Energy. Pursue climate mitigation in line with global and national targets and harness the potential for a more distributed renewables-focussed energy system to support the transition to a low carbon economy by 2050. The Strategy identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives (RPOs) including • **RPO 6.22:** EMRA support the preparation of the Marine Spatial Plan (MSP) to ensure alignment, and consistency between land use and ocean based planning, and to ensure co-ordination which supports the protection of the marine environment and the growth of the Marine economy. • **RPO 7.7:** To reduce harmful emissions and achieve and maintain good air quality for all urban and rural areas in the Region and to work with Local authorities and the relevant agencies to support local data collection in the development of air quality monitoring and to inform a regional air quality and greenhouse gas emissions inventory. • **RPO 7.36:** Planning policy at local authority level shall reflect and adhere to the principles and planning guidance set out in Department of Housing, Planning and Local Government publications relating to 'Wind Energy Development' and the DCCAE Code of Practice for Wind Energy Development in Ireland on Guidelines for Community Engagement and any other relevant guidance which may be issued in relation to sustainable energy provisions. • **RPO 10.24:** Support the sustainable development of Ireland's offshore renewable energy resources in accordance with the Department of Communications, Energy and Natural Resources 'Offshore Renewable Energy Development Plan' and any successor thereof including any associated domestic and international grid connection enhancements.
Southern Regional Assembly Regional Spatial and Economic Strategy	2020	The Southern Regional Assembly Regional Spatial and Economic Strategy provides a long-term, strategic development framework for the future physical, economic and social development of the Southern Region including County Wexford. The Strategy comprises 11 Statements of the Strategy, which include: • 5 - A Strong Economy: Building a competitive, innovative and productive economy • 8 - Low Carbon, Climate Resilient and Sustainable Society: Safeguarding and enhancing our environment through sustainable development, prioritising action on climate change across the Region, driving the transition to a low carbon and climate resilient society.

Policy Document	Year published	Comments
		The Strategy also notes the NPF's 10 National Strategic Outcomes (NSOs) including 'NSO 8 - the Transition to Sustainable Energy' which '…requires harnessing the considerable on-shore and offshore energy sources and the roll-out of the National Smart Grid Plan'. The following Regional Policy Objectives are also of relevance: • **RPO 56 - Low Carbon Economy:** The SRSES recognises the urgency to transition to a low carbon future and it is therefore an objective to accelerate the transition towards low carbon economy and circular economy through mechanisms such as the Climate Action Competitive Fund. It is an objective to develop enterprises that create and employ green technologies. Local authorities should ensure that the development of green industry and technologies incorporates careful consideration of potential environmental impacts at project level including the capacity of receiving environment and existing infrastructure to serve new industries.' • **RPO 76 - Marine Economy**: 'It is an objective to ensure alignment, and consistency between land use and ocean-based planning, and to ensure co-ordination, which supports the protection of the marine environment and the growth of the marine economy.' • **RPO 85 - Renewable Offshore Energy:** To promote regional cooperation in terms of offshore renewable energy development, environmental monitoring and awareness of the benefits of realising the Region's offshore energy potential. Initiatives arising from this objective shall be subject to robust feasibility and site selection, which includes explicit consideration of likely significant effects on European Sites and potential for adverse effects on the integrity of European sites in advance of any development. • **RPO 87 - Low Carbon Energy Future:** The RSES is a committed to the implementation of the Government's policy under Ireland's Transition to a Low Carbon Energy Future 2015-30 and Climate Action Plan 2019. It is an objective to promote change across business, public and residential sectors to achieve reduced GHG emissions in accordance with current and future national targets, improve energy efficiency and increase the use of renewable energy sources across the key sectors of electricity supply, heating, transport and agriculture. • **RPO 95 - Sustainable Renewable Energy Generation**: It is an objective to support implementation of the National Renewable Energy Action Plan (NREAP), and the Offshore Renewable Energy Plan and the implementation of mitigation measures outlined in their respective SEA and AA and leverage the Region as a leader and innovator in sustainable renewable energy generation. • **RPO 99 - Renewable Wind Energy:** It is an objective to support the sustainable development of renewable wind energy (on shore and offshore) at appropriate locations and related grid infrastructure in the Region in compliance with national Wind Energy Guidelines. • **RPO 219 New Energy Infrastructure:** It is an objective to support the sustainable reinforcement and provision of new energy infrastructure by infrastructure providers (subject to appropriate environmental assessment and the planning process) to ensure the

Policy Document	Year published	Comments
		energy needs of future population and economic expansion within designated growth areas and across the Region can be delivered in a sustainable and timely manner and that capacity is available at local and regional scale to meet future needs. • **RPO 222 Electricity Infrastructure:** It is an objective to support the development of a safe, secure and reliable supply of electricity and to support and facilitate the development of enhanced electricity networks and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this plan under EirGrid's (2017) Grid Development Strategy (subject to appropriate environmental assessment and the planning process) to serve the existing and future needs of the Region and strengthen all-island energy infrastructure and interconnection capacity.
Local Policy		
Wicklow County Development Plan 2022 - 2028	2022	The County Development Plan sets out the overall strategy for the planning and sustainable development of the County for the plan period and beyond. The plan relates to the whole functional area of Wicklow County Council. There are five municipal districts, of which Arklow is one. The Wicklow County Development Plan 2022 - 2028 includes the following objectives of relevance: • **SCO7**: Climate Resilience & the Transition to a Low Carbon Economy: Support the transition to low carbon clean energy by facilitating renewable energy use and generation at appropriate locations and supporting the development of offshore renewable energy enabling infrastructure especially at ports and harbours. Facilitate the sustainable management of waste including the circular economy. Restrict development in areas that are at risk of flooding and protect the natural landscape and biodiversity. • **CPO 9.21:** To encourage and facilitate the 'circular economy' and the development of 'green' industries, including industries relating to renewable energy and energy-efficient technologies, material / waste recycling and conservation. • **CPO 16.01:** To support and facilitate to the highest degree possible the development of alternative and renewable sources of energy, particularly in the generation of electricity / heating and for use as transport fuel. • **CPO 19.3:** To support the development of the Marine Economy / Blue Economy sector, particularly in the renewable energy, shipping and fishing / aquaculture sectors. To support the work of the Wicklow Maritime Business Development Group and the implementation of strategies and projects related to enhancing the marine economy.
Wicklow County Council Climate Action Plan 2024 - 2029	2024	The Wicklow Climate Action Plan sets out commitments to address climate change in line with statutory obligations, guided by the Climate Act 2021 and the National Climate Action Plan 2023. The overarching goal of the Plan is to transition to a climate-resilient, biodiverse, sustainable, and carbon-neutral County by 2050. The plan aligns with the national climate objective, which targets a climate-neutral economy by 2050.

Policy Document	Year published	Comments
Wicklow County Council Climate Change Adaptation Strategy	2019	This strategy demonstrates that Wicklow County Council is fully committed to tackling climate change to contribute to national and regional climate action objectives. The Strategy identifies that: *"'Wicklow has a growing renewable energy sector with wind energy production both onshore and offshore... Plans to extend the offshore capacity will result in County Wicklow being an important contributor into the national grid. The electricity supply network servicing the county and crossing the county is also a key asset."*
Wicklow Local Economic and Community Plan 2024 - 2029		The Wicklow Local Economic and Community Plan (LECP) 2024–2029 is a six year plan containing objectives and actions to promote and support economic development and local and community development in County Wicklow. The plan includes a number of High Level Goals and associated objectives including: • HLGH1 – Climate Action: Objective 1.5: Support the development of renewable energy opportunities, with the outcome for Wicklow to be: A county that explores all opportunities to lead in the development and provision of renewable energy, especially offshore wind energy. • HLG2 - Enterprise, Innovation and Creativity: Objective 2.5: Support the development of the circular economy and community wealth building, outcome: New models of economic development that are innovative and sustainable in the county and to reduce the local and global environmental impact of our consumption and production. • HLG2 - Enterprise, Innovation and Creativity: Objective 2.6: Capitalise on natural resources such as the maritime economy ensuring nature-based solutions, outcome: A vibrant and sustainable marine economy that is environmentally innovative The two-year implementation plan contains key actions under each of the HLG above which are of relevance to the Proposed Development: • HLGH1 – Climate action – Objective 1.5: – 1.4.1: Support the development of off-shore wind energy especially through the provision of infrastructure – 1.4.2: Maximise opportunities for investment, jobs, supply chain and skills development from offshore renewable energy • HLG2 – Enterprise, Innovation and Creativity – Objective 2.5: – 2.5.1: Explore opportunities to develop port infrastructure to support the offshore renewable energy sector – 2.5.4: Encourage local supply chain opportunities for the marine sector – Objective 2.6:

Policy Document	Year published	Comments
		• 2.6.5: Develop a Renewable Energy Training Facility at Wicklow County Campus in partnership with KWETB
Arklow and Environs Local Area Plan 2018 -2024	2018	The Arklow and Environs Local Area Plan 2018 to 2024 acknowledges the benefits that the maritime sector, including offshore renewable energy, brings to the area and acknowledges that Wicklow County Council support the identification and realisation of economic opportunities within this sector.
Arklow Local Planning Framework 2026 / Proposed Variation No. 6 Wicklow County Development Plan 2022 - 2028	2025	The Arklow Local Planning Framework (LPF) 2026 / Variation No. 6 to the County Development Plan 2022 – 2028 was adopted and came into effect on 6 July 2026 and is of particular relevance as follows: • Economic Development and Employment Strategy seeks: *"To support a shift towards low carbon and climate change resilient economic and enterprise activity, reducing energy dependence, promoting the sustainable use of resources and leading in the Smart Green Economy in particular noting Arklow's designation as Co. Wicklow's first decarbonisation zone."* • Service Infrastructure Strategy for Arklow seeks to: "*To promote energy efficiency and the development of renewable energy projects;*" The Arklow LPF, further supports the opportunity presented by the Proposed Development, noting that: *"There is a particular opportunity for Arklow to build on the renewable energy sector with the planned development of Arklow Bank Phase 2 and the designation of Arklow as County Wicklow's first decarbonisation zone"….* *"South Quay is the more industrialised and active commercial part of the Waterfront Zone. Offshore wind energy presents new opportunities for future employment development and regeneration on South Quay in particular noting plans for an operation and maintenance facility to support the operation of Arklow Wind Bank 2.."*
Wexford County Development Plan 2022-2028	2022	The County Development Plan 2022-2028 sets out the overall strategy for the proper planning and sustainable development of County Wexford for the plan period and beyond. The Plan seeks to protect, mitigate and adapt to the impacts of climate change and notes that: *"'Climate action is integrated into every chapter and strategy in the plan. Each chapter includes a sub-section outlining how the spatial strategy and objectives of that chapter have been climate proofed and/or will contribute to mitigation and adaptation to climate change".* The Wexford County Development Plan 2022 - 2028 includes the following objectives of relevance: • **CA01:** To ensure that the spatial planning of County Wexford provides for a county that is resilient to climate change, encourages development along existing transport corridors,

Policy Document	Year published	Comments
		enables the decarbonisation of the county's economy and reduces the county's carbon footprint in support of national targets for climate mitigation and adaptation objectives as well as targets for greenhouse gas emissions reductions. • **CA04:** To implement the Energy Strategy contained in Volume 10 of the Wexford County Development Plan to facilitate the transition to a low carbon county1## • **CZM11:** To support the sustainable growth and development of the maritime area and the maritime economy in accordance with the objectives of this chapter and the relevant objectives in Chapter 6 Economic Development Strategy, Chapter 8 Transportation Strategy, Chapter 9 Infrastructure Strategy, Chapter 11 Landscape and Green Infrastructure, Chapter 13 Heritage and Conservation and Volume 10 Energy Strategy as referred to in Table 12-1 and subject to compliance with the Habitats Directive and the proper planning and sustainable development of the area. • **CZM14:** To support development in the coastal zone and maritime area that will facilitate a transition to a low carbon economy such as carbon capture and storage and renewable energy developments including offshore tidal and wind energy subject to compliance with Objective CZM46 and the proper planning and sustainable development of these areas. • **CZM51:** To support, within the context of the Offshore Renewable Energy Development Plan (OREDP) and its successors, the development of Ireland's offshore renewable energy potential, including domestic and international grid connectivity enhancements subject to compliance with the objectives of this County Development Plan, the protection of the scenic amenity and coastal views associated with coastal areas and the marine area which are crucial to the tourism industry, the protection of the amenity, livelihood and cultural well-being of coastal communities, the protection of coastal features, habitats and species and compliance with the Habitats Directive and normal. • **ES24:** To support the development of offshore renewable energy in accordance with the Offshore Renewable Energy Development Plan (Department of Communications, Energy and Natural Resources, 2014), the Climate Action Plan 2019 and any Maritime Spatial Plan that is adopted for Ireland.
Wexford County Council Climate Action Plan 2024-2029	2024	The Wexford County Council Climate Action Plan 2024-2029 sets out how Wexford County Council will be responsible for enhancing climate resilience, increasing energy efficiency, and reducing greenhouse gas emissions, across the County. The mission statement is: "*to transition County Wexford to a Climate Resilient, Biodiversity Rich, Environmentally Sustainable and Climate Neutral Economy."* With respect to offshore wind energy projects the Plan states: *"The offshore wind industry offers strong commercial possibilities for the port [Rosslare] and county in general. It will also provide much needed infrastructure to enable Ireland to reach its renewable energy targets into the future. (Local Economic and Community Plan 2023 - 2029)."*

5.1.4 Consideration of the Proposed Development that is seeking Derogation

ALIGNMENT WITH LEGISLATION AND POLICY

5.1.4.1 Ireland's decarbonisation and climate action targets are necessary in the fight against climate change. Urgent action is required to meet Ireland's targets and offshore wind is a critical part of Ireland's strategy to achieve these targets as presented in Sections 5.1.2 and 5.1.3.

5.1.4.2 In December 2022, the Applicant obtained a Maritime Area Consent (MAC) (Ref 2022-MAC-002) for the construction and operation of an offshore windfarm and associated infrastructure (including decommissioning and other works) on and around Arklow Bank in the Irish Sea. As such, the Proposed Development is only one of a limited number of offshore wind energy projects that has secured a Maritime Area Consent.

5.1.4.3 Additionally, consents for the Onshore Grid Infrastructure (Planning Reference 310090) and Operational Maintenance Facility (Planning Reference 211316) have been granted 26 May 2022 and 20 July 2022, respectively. Planning application has been sought, with an application made to An Bord Pleanála in June 2024 and response to the request for information submitted to ACP in March 2026.

5.1.4.4 The Proposed Development is the most advanced offshore wind project in development in Ireland currently, having secured planning permission for the onshore grid infrastructure for connecting to Ireland's transmission system, and an operations and maintenance facility in Arklow.

5.1.4.5 The Proposed Development is therefore well placed to contribute in a substantial and necessary way to Ireland's 2030 climate targets. Subject to planning permission, the Proposed Development will deliver 800MW of offshore renewable energy expected to begin exporting to the Irish grid from 2030. As such, the Proposed Development will provide a significant contribution to the offshore wind sector in Ireland, to support both the 2030 Irish decarbonisation targets and commitments, as well as Ireland's energy security of supply.

CARBON SAVINGS ATTRIBUTABLE TO THE PROPOSED DEVELOPMENT

5.1.4.6 To demonstrate that the Proposed Development is clearly in the overriding public interest, it's contribution to carbon savings and national targets is presented. The Proposed Development has an anticipated maximum generating capacity of 800MW, however due to a variety of factors, the maximum generating capacity will not apply all the time (which is referred to as the 'load factor'). The Proposed Development will generate 3,153.6 GWh of renewable energy annually when a 45% load factor is assumed (Department of Climate, Energy and Environment, 2023) irrespective of which Project Design Option is selected. A number of scenarios have been used to estimate potential carbon savings attributable to the Proposed Development:

5.1.4.7 Using the latest data from the EPA (EPA 2025a) for emissions intensity of power generation (i.e. 254 g CO_2/kWh in 2023), this would equate to the annual displacement of 801,104 tCO2eq or a cumulative displacement of 29,637,533 tCO_{2eq} from the Proposed Development between 2030 and 2066. This scenario represents the most recent published carbon load of electricity (EPA, 2025a).

5.1.4.8 Using the latest EPA projections for emissions intensity of power generation (i.e. 226 g CO2/kWh in 2024), this would equate to the annual displacement of 712,714 tCO_{2eq} or a cumulative displacement of 26,370,403 tCO_{2eq} between 2030 and 2066 from the Proposed Development. This scenario considers the most recent projected carbon load of electricity (EPA, 2025c).

5.1.4.9 The annual carbon displacement or carbon savings attributable to the Proposed Development have been compared against the latest GHG emissions for 2023 (EPA, 2025a) and the projected

annual emissions in 2030 (EPA, 2025c) in Table 5-2. As illustrated in Table 5-2, the annual carbon savings attributable to the Proposed Development is estimated to be equivalent to 1.65 - 2.15% of the projected national emissions in 2030 and 16.2 - 23.6% of the projected emissions that are required for the energy industries in 2030. As such, the annual carbon displaced indirectly and these savings in GHG emissions would be attributable to the Proposed Development.

Table 5-2: Comparison of Annual Emissions in 2023 and 2030 and Estimated Carbon Savings

Parameter	Annual emissions (tCO_{2eq})	% Attributable to Proposed Development (Scenario 1)	% Attributable to Proposed Development (Scenario 2)
Actual emissions in 2023 - Sourced from EPA, 2025a			
National emissions (exc LULUCF)	54,934,000	1.46%	1.30%
National emissions (inc LULUCF)	58,829,000	1.36%	1.21%
Sectoral emissions - Energy Industries	7,860,000	10.19%	9.07%
Projected annual emission allocation in 2030 - Sourced from EPA, 2025c			
National – With Existing Measures	43,200,000	1.85%	1.65%
National – With Additional Measures	37,300,000	2.15%	1.91%
Sectoral - With Existing Measures	4,400,000	18.20%	16.20%
Sectoral – With Additional Measures	3,400,000	23.56%	20.96%

5.1.4.10 The annual displacement attributable to the Proposed Development is estimated as 712,714 tCO_{2eq} and 801,104 tCO_{2eq}. The estimated cumulative displacement of between 26,370,403 tCO_{2eq} and 29,637,533 tCO_{2eq} during 2030 and 2066 is considered to be of a large contributor to achieving the national climate obligations that are required.

CASE LAW – COOLGLASS JUDGMENT

5.1.4.11 The relevance of national climate obligations to decision-making has recently been clarified by the Irish Supreme Court in the Coolglass Wind Farm judgment (Coolglass Wind Farm Limited v An Coimisiún Pleanála [2026] IESC 5). The Court confirmed that under the Climate Action and Low Carbon Development Act 2015, as amended that public bodies are required to perform their functions in a manner consistent with the State's statutory climate objectives and the approved Climate Action Plan (CAP25).

5.1.4.12 The judgment confirms that the provision applies to the functions of all relevant bodies, and obliges such bodies to exercise those functions consistently with the climate objectives so far as practicable. This is to ensure that decisions and actions of such bodies are all aligned with the climate objectives.

5.1.5 Conclusion on Test 1

5.1.5.1 The Applicant considers that the benefit delivered by the Proposed Development to decarbonisation, security of supply and contribution towards achieving the national climate obligations demonstrates imperative reasons of overriding public interest and so the presumption

of overriding public interest under Article 16f of Directive (EU) 2023/2413, and Regulation 43D of the Habitats Regulations is not rebutted. As such, the Applicant considers that the evidence herein demonstrates that 'Test 1' has been met as the derogation licence is required for one of the permitted reasons under Regulation 54(2) of the Habitats Regulations.

5.2 Test 2 - Absence of Alternative Solutions

5.2.1 Overview

5.2.1.1 It has been concluded in the sections above that the piling required to install the foundations requires a derogation licence in accordance with Regulation 54 of the Habitats Regulations. This is referred to as the 'activity requiring derogation' throughout this section. The evidence as to whether satisfactory alternatives exist to the activity requiring derogation is presented in this section.

5.2.1.2 The evidence as to whether satisfactory alternatives exist to the activity requiring derogation that is being sought pursuant to Regulation 54 of the Habitats Regulations is presented herein. This section considers the full range of alternative solutions to the proposed activity taking account of the best relevant scientific and technical evidence available, including a comparison of alternative solutions and justification as to why the alternatives are not satisfactory.

5.2.1.3 The NPWS states the following in relation to the EC guidance on this test:

"The EC Guidance refers to case law in this area and states that this test involves answering three fundamental questions:

(a) What is the problem or specific situation that needs to be addressed?

(b) Are there any other solutions?

(c) If so, will these resolve the problem or specific situation for which the derogation is sought?

Applicants are asked to provide clear answers to these questions in their application and in their supporting documentation, where it is provided."

5.2.1.4 The Objectives of the Proposed Development are outlined in Section 1.2.2 whilst the Objective of the Proposed Activities have been described in Section 1.2.3.2. In response to Part (a) of the NPWS and EC guidance, the problem that needs to be addressed is how to install the Proposed Development infrastructure (specifically WTGs and OSPs) into the seabed in a safe and structurally sound way. Parts (b) and (c) are addressed in Sections 5.2.3 through to Section 5.2.4 with a conclusion provided in Section 5.2.5.

5.2.1.5 For completeness and based on engagement with the NPWS, satisfactory alternatives to the activity requiring derogation have been considered in relation to this problem as well as wider alternatives at the scale of the Proposed Development as a whole.

5.2.1.6 This section presents the justification and evidence to demonstrate why the activity requiring derogation is the only solution and thus required as part of the construction of the Proposed Development. The absence of satisfactory alternatives therefore supports the need for the derogation that is being sought under Regulation 54 of the Habitats Regulations.

5.2.2 Defining a Satisfactory Alternative

5.2.2.1 Satisfactory alternatives to the activity requiring derogation are considered as those which allow for the implementation of the Proposed Development (and achievement of the Objectives of the Proposed Development and Proposed Activities including the associated delivery of 800MW of offshore renewable energy) whilst also protecting Annex IV species. This includes consideration whether any alternative would avoid or materially reduce the deliberate disturbance from the

activity requiring derogation (i.e. a comparison in terms of their impact on the species subject to strict protection).

5.2.2.2 Specifically, this evidence demonstrates why the activities that require derogation are the only satisfactory solution to resolve the problem facing the Proposed Development in accordance with the requirements of paragraph 3-55 of the EC Guidance which states:

"Only when it is sufficiently demonstrated that potential alternatives are not satisfactory, either because they are not able to solve the specific problem or are technically unfeasible, and when the other conditions are also met, can the use of the derogation be justified. However, if a measure is partially satisfactory even if it does not sufficiently address the problem, but it can still reduce or mitigate the problem, it should be implemented first."

5.2.2.3 The EC Guidance also provides the following interpretation of a satisfactory alternative in paragraph 3-56:

"The process to ascertain whether another alternative is unsatisfactory should be based on a well-documented assessment of all possible available options, including in terms of their effectiveness, based on the best available facts and data. The assessment of alternatives must be balanced in light of the overall objective of maintaining or restoring the favourable conservation status of the species of Community interest concerned (it must therefore take into account the conservation status, the impact of additional incidental or illegal removal of specimens and prospects of the population concerned). The assessment may also take into account proportionality in terms of cost. However, economic cost cannot be the sole determining factor when analysing alternative solutions. In particular, satisfactory alternative solutions cannot be rejected from the outset on the grounds that they would cost too much."

5.2.2.4 The term "satisfactory alternative" in Article 16(1) has been considered in Case C-601/22 Umweltverband WWF Österreich, the CJEU stated that the

S79 "...provision requires the Member States to provide a clear and sufficient statement of reasons as to the absence of a satisfactory alternative by means of which the objectives relied upon in support of a derogation could be achieved. Accordingly, it is for the competent national authorities to establish, taking account in particular of the best relevant scientific and technical evidence and in the light of the circumstances of the specific situation in question, that there is no satisfactory alternative that can achieve the objective pursued (judgment of 10 October 2019, Luonnonsuojeluyhdistys Tapiola, C‑674/17, EU:C:2019:851, paragraphs 49 and 51)"

S80, " The condition that there be no other satisfactory solution for the purpose of justifying the grant of a derogation under Article 16(1) of the Habitats Directive is therefore a specific expression of the principle of proportionality..."

S86 "...Article 16(1) of the Habitats Directive must be interpreted as meaning that, in the context of determining whether there is a 'satisfactory alternative' within the meaning of that provision, the competent national authorities are required to assess, on the basis of the best available scientific and technical knowledge, the other possible solutions, taking account, in particular, of their economic implications, without those implications being decisive, and balancing them with the general objective of maintaining or restoring the animal species concerned at a favourable conservation status".

5.2.2.5 In relation to *what* is sought to be achieved through the derogation, the Advocate General set out the following test in the case of Luonnonsuojeluyhdistys Tapiola Pohjois-Savo – Kainuury v Risto Mustonen (C-674/17) (EU:C:2019:394), a Member State must:

"identify clearly and precisely in the derogation decision the objectives being pursued by means of the derogation, establish that the derogation is capable of achieving those objectives and demonstrate that there is no alternative means of achieving them."

5.2.2.6 Separately, Regulation EU 2022/2577 laying down a framework to accelerate the deployment of renewable energy, as amended by Council Regulation (EU) 2024/223 of 22 December 2023, provides as follows:

"Article 3a(1) - When assessing whether there are no satisfactory alternative solutions to a project for a plant or installation for the production of energy from renewable sources and its connection to the grid for the purposes of Articles 6(4) and 16(1) of Directive 92/43/EEC, Article 4(7) of Directive 2000/60/EC and Article 9(1) of Directive 2009/147/EC, this condition may be considered as being fulfilled if there are no satisfactory alternative solutions capable of achieving the same objective of the project in question, notably in terms of development of the same renewable energy capacity through the same energy technology within the same or similar timeframe and without resulting in significantly higher costs."

5.2.2.7 Although this temporary Regulation has since expired, it remains a useful indication of the European Council's interpretation of 'satisfactory alternatives' for the purpose of Article 16(1) of the Habitats Directive.

5.2.3 Do Nothing Scenario

5.2.3.1 The 'do nothing' scenario would involve not undertaking the activity requiring derogation (i.e. installing the foundations required) for the Proposed Development. This would ultimately result in the Proposed Development not proceeding as there would be no satisfactory approach to facilitating the construction of the offshore infrastructure that is necessary to deliver the offshore wind farm and associated renewable energy.

5.2.3.2 Whilst this alternative would not generate any deliberate disturbance on Annex IV listed species, the 'do nothing' scenario is not a satisfactory alternative because the objectives of the Proposed Development and the Proposed Activities would not be achieved.

5.2.4 Alternatives to the Activity Requiring Derogation

ALTERNATIVE LOCATION

5.2.4.1 The Applicant considered whether the activity requiring derogation could reasonably be undertaken at an alternative location. The Applicant has assessed alternative locations for the Proposed Development as a whole and for the specific siting of the WTG and OSP infrastructure. The location of the activity requiring derogation depends entirely on the location of the WTGs and OSPs given that it involves the installation of foundations for these structures.

5.2.4.2 Alternative locations for the Proposed Development on the east and west coast of Ireland (Donegal Bay, Galway Bay, the Shannon estuary and east-Cork to west-Waterford along with Blackwater Bank, Codling Bank and Kish Bank) were assessed against technical, environmental, economic and deliverability criteria including wind resource, water depth, seabed conditions, grid connection opportunities, environmental constraints (including habitats, species and qualifying interests protected under the Habitats Directive) and the ability of each location to support commercial-scale offshore wind development. A number of sites on the west coast were considered early in the process but ruled out on the basis of technical criteria (i.e. rapidly increasing water depth, limited grid connection capacity and limited area available for development) which meant that they could not deliver the Objectives of the Proposed Development. The site selection process was undertaken for fixed-bottom offshore wind development, to ensure consistency with the Offshore Renewable Energy Development Plan and it was assumed that all locations would therefore require seabed-founded infrastructure and associated installation activities to support commercial-scale offshore wind development. Further detail on this is provided in Section 3.2 of Annex N of this document (which comprises Chapter 3 of the EIAR for the Proposed Development).

5.2.4.3 Arklow Bank was identified as the preferred location on the east coast because it combines favourable wind resource, water depths suitable for fixed-bottom foundations, proximity to existing and planned grid infrastructure, access to port facilities and comparatively low development constraints when assessed against alternative locations. Specifically, there were no designations or important factors identified, including an absence of SACs and sensitive locations for Annex IV species protected by the Habitats Directive. The site is also located within the east coast region which was identified as having the capacity to meet the Objectives of the Proposed Development as the east coast was identified as the least constrained region for offshore wind development following consideration of engineering, environmental, port, grid and marine use constraints.

5.2.4.4 The alternative locations were re-evaluated in 2026 in response to the RFI (refer to Section 3.3.3 of Annex N of this document for further detail). This review confirmed that Arklow Bank remains the most appropriate and deliverable location for the Proposed Development and that alternative sites are either already allocated to other developers (i.e. via a Maritime Area Consent), constrained by the absence of available grid connection capacity, subject to additional environmental constraints (i.e. further designations under the Habitats Directive), and/or lack a viable consenting pathway to facilitate commercial-scale offshore wind development. The alternative locations would therefore not achieve the Objectives of the Proposed Development.

5.2.4.5 In addition, the Proposed Development has been granted a Maritime Area Consent (Reference Number: 2022-MAC-002), consent has been granted to the Applicant from ACP for the onshore grid infrastructure (Planning Reference: 310090), consent has been granted to the Applicant from Wicklow County Council for the operational and maintenance facility (Planning Reference: 211316). Further, a substantial site-specific environmental baseline has been established through extensive site-specific survey programmes and assessments that have been undertaken over a long time period to support the planning application that was made to ACP for the Proposed Development in June 2024 (Planning Reference: 319864).

5.2.4.6 The location of the activity requiring derogation is therefore required to be within the Array area which has been granted a Maritime Area Consent (Reference Number: 2022-MAC-002) and is subject to the planning permission that has been sought from ACP (Planning Reference: 319864). Any other location would require a new Maritime Area Consent and planning application with significant regulatory, commercial viability and deliverability risks and constraints. This would mean that the Proposed Development would not achieve its Objectives as it would not be delivered by 2030 and would not support the national renewable energy targets.

5.2.4.7 Further, the Annex IV cetacean species are highly mobile and occur widely throughout Irish waters and across the relevant IAMMWG Management Units. Therefore, relocating the activities to another location in Irish waters would not avoid the potential for deliberate disturbance on Annex IV cetacean species. Instead, any relocation would substitute the disturbance associated with one location to another where the Annex IV species may occur.

5.2.4.8 Table 5-3 illustrates that having considered alternative locations, the Applicant has concluded that there is no alternative location that would allow delivery of the Proposed Development while avoiding the need for the activity that requires derogation (i.e. foundation installation works to support a commercial-scale offshore wind development). Alternative locations would still require seabed-founded infrastructure and associated marine construction activities. Relocating the activity requiring derogation would therefore not avoid the potential for deliberate disturbance on Annex IV cetacean species and would instead substitute one location for another while introducing additional technical, environmental, regulatory and deliverability constraints. Accordingly, no alternative location has been identified as satisfactory (i.e. that would achieve the objectives of the Proposed Development while at the same time avoiding or materially reducing the activity requiring derogation and the associated risk for disturbance to Annex IV cetacean species). Further, there is no evidence that an alternative location would avoid or materially

reduce or remove disturbance to Annex IV cetaceans to an extent that would remove the need for a derogation.

Table 5-3: Summary of the consideration of satisfactory alternative location of activity requiring derogation including comparison of impact on Annex IV species

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Alternative locations considered during site selection – i.e. Donegal Bay, Galway Bay, the Shannon estuary and east-Cork to west-Waterford, Blackwater Bank, Codling Bank and Kish Bank	No – Derogation still required. Offshore wind development would still require seabed-founded infrastructure and associated marine construction activities.	No. Disturbance not avoided or reduced as there is no evidence to demonstrate relocation would avoid or lower disturbance risks than those for Arklow Bank given mobility of species.	Less environmental data, reduced deliverability and more constrained development opportunities exist at alternative locations. Delivery by 2030 would not be achieved. Disturbance associated with the activity requiring derogation would still be expected. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented.
Location of activities being sought pursuant to this derogation licence application	No - – Derogation still required as demonstrated herein.	No. Disturbance not avoided or reduced as demonstrated herein.	Extensive baseline data collection and site-specific surveys undertaken to understand environmental constraints and opportunities. MAC and two planning consents granted (for onshore grid and operations and maintenance facility) whilst application for offshore infrastructure was made in June 2024. The site location can deliver the Proposed Development and its objectives.

ALTERNATIVE SCALE

5.2.4.9 The scale of the activity requiring derogation depends entirely on the scale of the Proposed Development, i.e. the number of offshore structures (WTGs and OSPs) requiring foundations. The quantum of structures required has been determined based on the maximum export capacity (800MW) and the technology available to deliver this. Any reduction in the maximum export capacity of the project would impact the overall viability of the Proposed Development and also on the ability of the government to deliver on its 2030 targets.

5.2.4.10 The design has been iteratively refined to reduce the scale of activity requiring derogation (i.e. number of WTG and OSPs required) to the greatest extent whilst providing a robust design in accordance with the design flexibility that has been sought for ABWP2 to ensure deliverability.

5.2.4.11 The Applicant has sought consent for two discrete Project Design Options in accordance with an opinion issued from An Bord Pleanála, now known as ACP. This design flexibility is necessary to ensure that the Proposed Development can avail of technology development and advancements, work with the supply chain, ensure effective procurement and vessel availability during the construction programme. Specifically, the Applicant requires flexibility to avail of developing technology which will be more effective and efficient than the technology available at the time of the application. This specifically relates to flexibility to construct either one of two WTG options. The WTG supply and installation vessel market is a worldwide market, and Ireland is competing with numerous other offshore wind markets looking to ramp up their deployment of offshore wind. It is becoming much more challenging to get supply chain to engage fully with projects and due

to limited WTG manufacturing capacity and vessel availability, it is becoming a market where WTG suppliers as well as vessel owners can choose what tenders to even participate in. Further reducing optionality puts the project in a position where it is significantly exposed to both delivery and availability issues and associated commercial viability challenges. Each Project Design Option has sought to minimise the scale of activities in accordance with the requirements of Article 16 of the Habitats Directive.

5.2.4.12 The purpose of the OSPs is to transform the electricity generated by the wind turbines (at 66 kV) to a higher voltage (220 kV), allowing the power to be efficiently transmitted to shore. Alternative options included the construction of between four to no OSPs. Due to the maximum export capacity (800MW), a connection voltage of 220kV as specified by Eirgrid and technical limitations with a single OSP solution exporting 800MW, the preferred connection method for the Proposed Development is to progress with a 2 x OSP solution.

5.2.4.13 The number of WTGs has been reduced iteratively for each Project Design Option so as to minimise environmental impacts, including potential deliberate disturbance to Annex IV species. The alternatives included up to 200 WTGs, however the number of WTGs has been reduced in so far as practicable (i.e. to 47 or 53 WTGs) whilst ensuring the delivery of 800 MW, and thus decrease the potential for deliberate disturbance to marine mammals from the activity requiring derogation. As such, the Applicant has minimised the scale of activities inherently through the reduction in the number of WTGs so as to minimise the scale of activities that could generate underwater noise, and associated deliberate disturbance to Annex IV cetacean species.

5.2.4.14 The scale of activities (i.e. application for either 47 or 53 WTGs and 2 OSPs which necessitate the activities that require derogation) is therefore necessary to ensure that the maximum export capacity can be achieved. Any further reduction in the scale of activities would inhibit the attainment of the 800MW and therefore would not be considered a satisfactory alternative. Whilst any increase in the scale of activities would result in additional foundation installation, associated potential increase in the duration of piling activities required and therefore presenting a greater potential for deliberate disturbance on Annex IV cetacean species. The Applicant therefore concludes that no satisfactory alternative scale has been identified that would achieve the objectives of the Proposed Development whilst further reducing the activity requiring derogation to an extent that would remove the need for a derogation.

Table 5-4: Summary of the consideration of satisfactory alternative scale of activity requiring derogation (i.e. number of structures for the WTGs and OSPs)

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Greater scale of activities (i.e. increased number of WTG and/or OSP structures)	No – Derogation still required with potential for deliberate disturbance to a greater extent (i.e. based on a higher number of structures being installed).	No. Disturbance not avoided or reduced and potentially to a greater extent (i.e. based on a higher number of structures being installed, over a longer period).	Any increase scale of activities may give rise to greater extent of deliberate disturbance. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented whilst protecting Annex IV species.
Lesser scale of activities (i.e. reduced number of WTG and/or OSP structures)	No – Derogation still required, albeit potentially to a lesser extent (i.e. based on a lower number of	No. Disturbance not avoided but potentially reduced to a lesser extent (i.e. based on a lower number of	Any further reduction in the scale of activities would inhibit the attainment of the 800MW and on the overall viability of the Proposed Development.

	structures being installed).	structures being installed).	Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and/or its' objectives to be achieved.
Scale of activities being sought pursuant to this derogation licence application (i.e. WTG and OSP structures)	No – Derogation still required.	No. Disturbance not avoided or reduced as demonstrated herein.	The design has been optimised to reduce the scale of activity requiring derogation to the greatest extent whilst delivering the Proposed Development and its' objectives.

ALTERNATIVE DESIGN AND LAYOUT

5.2.4.15 The layout of the activity requiring derogation depends entirely on the specific location of each of the WTGs and OSPs.

5.2.4.16 Throughout the design iteration process for the Proposed Development, the Applicant considered whether the activity requiring derogation could be relocated within the Array area (i.e. via a different layout of the offshore wind farm and supporting infrastructure therein). The design and layout are intrinsically linked to the physical and environmental constraints i.e. wind resource, water depth, seabed conditions, navigation requirements, existing infrastructure, archaeological and environmental constraints such as the presence of Annex I habitats.

5.2.4.17 Each of the Annex IV marine mammal species are highly mobile and differ in their foraging distances and seasonal distribution based on their ecology and behaviour – specifically, each species is comprised of a highly mobile coastal population of individuals. There are no biologically distinct local populations in proximity to the Proposed Development. As outlined by the Inter-Agency Marine Mammal Working Group (IAMMWG, 2023), almost all species of cetacean found in UK and Irish waters are part of larger biological populations whose ranges extend into international waters and/or the High Seas.

5.2.4.18 On a precautionary basis, it has been assumed that each of the five Annex IV species may therefore be present in the vicinity and have the potential to be exposed to deliberate disturbance as they use the area for migration or their natural movements. Additionally, it is assumed that each of the five Annex IV species may use the area for breeding, calving or rearing young, with the exception of minke whale which are not known to breed in Irish waters. The number of individuals present at any one time in a particular area is likely to represent only a small proportion of those that make use of UK and Irish waters throughout the year, however the exact number or location of particular individual(s) cannot be reliably established or predicted at a very fine spatial scale (i.e. a particular location within the array area). The high spatial and temporal variation in marine mammal abundance and distribution in any particular area of the sea, it is not possible to predict with certainty how many animals may be present within the zone of influence of noise impacts from a particular source at a very fine scale (and thus distinguish which individual at a particular location could experience deliberate disturbance from piling associated with a microsite such as a WTG location).

5.2.4.19 The assessment has therefore been undertaken at the scale of the relevant Study Areas (as described in detail in Section 4.5). The Marine Mammal Study Area encompasses the Array Area, and Cable Corridor and Working Area of the Proposed Development, plus a 4 km corridor - the 4 km corridor extends around the Array Area, covering the area west of the Array Area towards the coast. The assessment is undertaken using density and abundance estimates derived from a range of different density sources, including site-specific DAS and SCANS surveys. A

precautionary approach has been adopted through the use of the highest available density estimates, representing a worst-case scenario. The number of animals estimated to be disturbed are calculated based on these worst-case density estimates, along with impacted ranges, which incorporate conservative assumptions factored into the associated underwater noise modelling. Additionally, on a precautionary basis the underwater noise modelling assumes that the maximum hammer energy would be reached at all locations, which is unlikely to be the case. Accordingly, the assessment has been undertaken at a spatial scale that is ecologically relevant to highly mobile marine mammal species and incorporates conservative assumptions regarding species distribution and underwater noise propagation. The assessment does not identify any evidence that relocating individual foundations within the Array Area would result in a meaningful reduction in the number of marine mammals potentially exposed to disturbance. Therefore, this demonstrates that there is no scientific or ecological basis for adopting a very fine spatial scale in relation to the location of the activities.

5.2.4.20 Further, there are no distinguishable ecological, biological or physical features that would make a particular location with the array area more or less favourable to Annex IV species than any other. The species considered are highly mobile and are assumed, on a precautionary basis, to be capable of occurring throughout the Array Area. Relocating the activity to a different position/location within the Array area would therefore not avoid the potential for deliberate disturbance on Annex IV species associated with foundation installation. Instead, it would substitute the potential disturbance from one location to another within the same developmental area. This conclusion is supported by a precautionary assessment approach, based on worst case density estimates and a conservative approach to underwater noise modelling that has been undertaken and presented in Annex K of this document.

5.2.4.21 Given their mobile nature and the justification above, Annex IV marine mammal species were assumed to be present across the Array area (in accordance with the precautionary principle) and this was considered accordingly throughout the development of alternative design and layouts. The design and layout for each Project Design Option has been selected on the basis of the physical and environmental constraints as well as safety considerations such as the requirements of the Irish Coast Guard (in relation to search and rescue access coverage and the need for 500m spacing between blade tip to blade tip of all surface infrastructure and 500 m spacing between WTGs and OSPs). Other layouts were not approved by the Irish Coast Guard and therefore would not have allowed the Proposed Development to proceed. The Safety Justification for the Proposed Development activities is available in Annex P of this document.

5.2.4.22 The design and layout of activities (i.e. locations within the array area of the 47 or 53 WTGs and 2 OSPs which necessitate the activity requiring derogation) is therefore necessary given the physical and environmental constraints as well as safety requirements.

Table 5-5: Summary of the consideration of satisfactory alternative design and layout of activities

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Alternative layout options	No – Derogation still required.	No - Disturbance not avoided or reduced. There are no distinguishable ecological, biological or physical features that would make a particular location within the Array area more or less favourable to Annex IV species.	Other layouts were either not technically viable (from an engineering perspective based on the site conditions) or suitable from a safety perspective. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.

Design and layout of activities being sought pursuant to this derogation licence application	No. Still required.	No. Disturbance not avoided or reduced as demonstrated herein.	The design and layout of the activities has been optimised to deliver against physical and environmental constraints of the site and in accordance with the safety requirements of the Irish Coast Guard.

ALTERNATIVE TYPE OF ACTIVITY REQUIRING DEROGATION

ALTERNATIVE FOUNDATION TYPES

5.2.4.23 The principal source of deliberate disturbance on the Annex IV species in this application from the activity requiring derogation arises from underwater noise associated with foundation installation. The assessment of alternative foundation types has therefore focused not only on engineering and environmental considerations but also on whether the alternative would avoid or materially reduce the deliberate disturbance that necessitate the requirement for derogation.

5.2.4.24 Three different types of foundations were initially considered for the Proposed Development to support the WTGs and OSPs. These consisted of;

- Monopiles;
- Piled jackets; and
- Gravity bases.

5.2.4.25 Having regard to the site characteristics of Arklow Bank, including water depth, seabed mobility, ground conditions and the 800MW scale of the Proposed Development, the Applicant identified monopiles, jackets and gravity bases as the only technically feasible fixed-bottom foundation options warranting detailed consideration which has been documented in Section 3.9.1 of Annex N of this document. No other types of foundation were identified as reasonable or satisfactory alternatives capable of delivering the objectives of the Proposed Development at the required scale at the Arklow Bank.

5.2.4.26 Monopile foundations typically consist of a single hollow steel tube installed at depth into the seabed. Transition pieces are fitted over the monopile and secured via bolts or grout. The transition piece may include boat landing features, ladders, a crane, and other ancillary components as well as a flange for connection to the turbine tower. Monopiles are installed into the seabed by either piling or drilling techniques, or a combination of both (drive-drill-drive), depending on seabed conditions. Typically, monopiles will be piled into the seabed using a hydraulic hammer until any hard ground is encountered, with drilling techniques deployed to install the remaining length of pile, if required. If necessary, the monopile is then grouted in place where the annulus between the rock and pile is filled with inert grout. Grout is pumped into the monopile from a vessel, with the process carefully controlled and monitored to ensure minimal spillage to the marine environment.

5.2.4.27 Jacket foundations comprise a steel lattice structure, with tubular steel members and welded joints, secured to the seabed by hollow steel pin piles. Jacket piles can be installed into the seabed using either piling, drilling techniques, a combination of both (drive-drill-drive). Alternatively, jackets can be anchored to the seabed using suction buckets. The method by which jackets are anchored to the seabed is dependent on seabed conditions. As for monopiles, piles will be driven into the seabed using a hydraulic hammer until any hard ground is encountered, at which point the drive-drill-drive technique would be deployed to install the remaining length of pile, if required. In the drilling scenario, the jacket piles would be grouted in place where the annulus between the caisson, rock and pile is filled with inert grout. It is possible for the pin piles to be installed in advance of installation of the jacket structure. If this is the case, a piling template

will be placed onto the seabed to guide the installation, and the jacket structure is then welded to the piles. Alternatively, the pin piles can be installed after the jacket structure has been lowered to the seabed, through the jacket legs or pile sleeves attached to the jacket leg.

5.2.4.28 Gravity base foundations are heavy concrete, or steel and concrete structures, sometimes including additional ballast, that sit on the seabed to support the turbine tower. Gravity bases vary in shape, but are significantly wider at the base (at seabed level) to provide support and stability to the structure. They then generally taper to a smaller width at or below seabed level. A gravity base does not require piling or drilling to remain in place.

5.2.4.29 During the development of the Project Design Options, gravity base and jacket foundations were excluded from further consideration for the following reasons:

- Gravity Bases:
  - Gravity bases, which simply rest on the seabed, are not considered to be technically feasible at the Proposed Development due to the high levels of bed level change associated with the Arklow Bank in the Array Area.;
  - Gravity base foundations are not widely used in the offshore wind industry and are therefore the least proven technology;
  - There is a less-established supply chain for gravity base foundations, which could potentially increase development costs and execution risk. Installation methods can constrain the supply chain in terms of transportation and installation vessels, fabrication yards and marshalling ports;
  - Gravity base have a higher cost to fabricate and install;
  - Gravity bases have a higher carbon footprint associated with construction and installation than monopile foundations;
  - For all of the above reasons gravity bases are typically only used where monopile or jacket foundations are not technically feasible due to shallow bedrock or other unfavourable ground related conditions.
- Jackets:
  - Jackets which employ suction buckets would not be technically feasible at site due to the dynamic nature of the seabed. Jackets which rely on piles would require impact hammering of the piles themselves or of the caisson required to hold back superficial deposits above bedrock (see below for further detail on monopile installation techniques which are also applicable to jacket piles).
  - Jacket foundations have a higher cost to fabricate and install;
  - Jacket foundations require bespoke fabrication which takes a considerable amount of time and manpower to fabricate;
  - Jackets have a higher carbon footprint associated with construction and installation than monopile foundations;
  - For all of the above reasons jackets are only considered for use in deeper waters in which, for the given application, monopiles are not technically feasible. Given the moderate water depth of the Proposed Development's deepest foundation it is not necessary to use jacket foundations.

5.2.4.30 From an environmental perspective, gravity base and jacket foundations are less preferred compared to monopile foundations because:

- Gravity base foundations can have significantly greater physical dimensions, leading to a greater obstruction to flow in the water column and associated potential impacts on physical processes such as waves, currents and sediment transport;

- Gravity base foundations rely on shallow waters, which means they are more susceptible to seabed mobility than other foundation types. Consequently, if technically feasible, considerable levels of scour and seabed mobility protection are required to prevent against structural damage of the foundation, leading to a greater seabed footprint; and
- Gravity base and jacket foundations require large areas of seabed preparation, which would result in larger quantities of scour protection and higher potential for environmental impacts such as habitat loss and habitat disturbance;
- The methodologies to install gravity base foundations require a large footprint; and
- Jacket foundations take up a considerable amount of deck space so a limited quantity can be shipped by barge or installation vessel at one time thereby prolonging installation timeframes and therefore potential impacts during construction.
- Jacket foundations with driven piles (3-4 piles per jacket) would require multiple impact hammering events per location when compared to a single impact hammering event for a monopile foundation.
- Due to their increased weights and more complex fabrication processes, both jackets and gravity bases have higher carbon footprints on a like-for-like basis than monopiles.

5.2.4.31 Jacket foundations supported by driven piles would not remove the need for impact hammering and would therefore not avoid the activity requiring derogation. Jacket structures also typically require three or four piles per foundation, which would result in multiple impact hammering events per WTG compared with a single hammering event for a monopile foundation. Accordingly, piled jacket foundations have the potential to generate a greater level of deliberate disturbance (i.e. underwater noise-producing activity), likely over a longer period than the selected monopile solution.

5.2.4.32 Whilst utilising gravity base foundations may negate the need for the activities that require a derogation, gravity base foundations are not considered a satisfactory alternative at Arklow Bank because the dynamic seabed conditions and significant bed level mobility within the Array Area would create unacceptable engineering and operational risks. In addition, gravity bases would require substantially greater seabed preparation, scour protection and habitat disturbance than the selected monopile solution which may create other direct and indirect effects on habitats and species protected under the Habitats Directive.

5.2.4.33 Accordingly, neither gravity bases nor jacket foundations represent a satisfactory alternative capable of delivering the Proposed Development whilst avoiding or materially reducing the activity requiring derogation. Due to the reasoning above monopile foundations were chosen to support the WTGs and the OSPs and is considered the only satisfactory alternative (i.e. technically feasible foundation option) for the Proposed Development.

Table 5-6: Summary of the consideration of satisfactory alternative type of activities (foundation type)

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Monopiles (i.e. foundation type being sought pursuant to this derogation licence application)	No – Derogation still required.	No - - Disturbance not avoided or reduced.	Due to ground and environmental constraints the monopile foundation is the appropriate technical solution. The monopile foundation has been optimised to deliver against physical and environmental constraints of the site including ground conditions

			whilst minimising potential deliberate disturbance of Annex IV species.
Jacket (piled)	No – Derogation still required, albeit potentially to a greater extent (i.e. based on a more piles being installed for each of the jacket legs).	No - Disturbance not avoided or reduced and potentially to a greater extent spatiality and temporally.	Piled jacket foundation may give rise to greater deliberate disturbance due to the longer piling duration. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented whilst protecting Annex IV species.
Jacket (Suction Bucket)	Yes. Activity requiring derogation would not be required.	Potential to reduce disturbance.	Not technically feasible (from an engineering perspective) based on the site conditions (i.e. dynamic seabed conditions). Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.
Gravity Base	Yes. Activity requiring derogation would not be required.	Potential to reduce disturbance.	Not technically feasible (from an engineering perspective) based on the site conditions (i.e. seabed mobility). Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.

ALTERNATIVE INSTALLATION TECHNIQUES (FOR MONOPILES)

OVERVIEW OF METHODS

5.2.4.34 Following on from the decision to proceed with monopile foundations, three different methods of monopile installation were considered for the Proposed Development:

- Piling using a hydraulic impact hammer;
- Vibro hammering; and
- Drilling.

5.2.4.35 Due to the chosen foundation option (i.e. monopile) and ground conditions present across the Array Area, other alternative monopile installation techniques are not considered technically feasible and thus could not be considered a satisfactory alternative.

PILING USING A HYDRAULIC IMPACT HAMMER

5.2.4.36 This comprises driving the piles into the seabed using a hydraulic impact hammer. Once in place, the piles rely on the frictional, stiffness and end bearing properties of the soil they are in contact with for support. It is noted that various factors influence the time and number of hammer strikes

required to achieve the required penetration depth, including the type and size of hammer, pile size, and soil properties of the seabed.

5.2.4.37 Piling using a hydraulic impact hammer requires the following sequence of activities:

1) When piling a monopile using a hydraulic impact hammer, the monopile is lowered to seabed level using a crane and kept in position using a pile gripper.
2) The hydraulic impact hammer is then positioned onto the monopile and the monopile is driven to target depth.
3) Although a hammer energy of 3,500 kJ is considered as the maximum for the purposes of assessment, the actual energy used when piling will be significantly lower for the majority of the time and locations. The hammer energy is only raised to that maximum value when/if absolutely necessary (i.e. pile is failing to progress satisfactorily at lower energies).
4) In all cases piling will commence with a lower prescribed soft-start hammer energy during a 40-60 minute soft start. This is followed by a period where the hammer energy applied is that required for optimum pile advancement to target depth.

VIBRO HAMMERING

5.2.4.38 Vibro hammers are only effective in suitable soil conditions and have limited effect in high strength soils. Vibro hammering requires the following sequence of activities:

- As the name suggests a vibro-hammer imparts vibration on the pile and immediate surrounding soil.
- This vibration locally decreases soil resistance thereby allowing the monopile to penetrate through the soil.

5.2.4.39 Given the fact ground conditions at the Proposed Development comprise gravels and glacial till, vibro hammers could not be used to install the monopiles to target depth as the monopiles would stop penetrating before target depth is reached even at maximum vibro hammer energy. Therefore vibro hammers are not a satisfactory alternative which would negate the use of impact piling at the Proposed Development (i.e. the activity requiring derogation).

DRILLING

5.2.4.40 This comprises drilling rather than hammering a pile into the seabed to reach its target depth beneath the seabed. This can require either drive-drill-drive (DDD) or drilling and grouting techniques to drill the pile into the seabed as follows:

- DDD involves driving the monopile until it hits first refusal (i.e. rate of monopile advancement is below pre-determined threshold) or target depth. If refusal has occurred above the required installation depth a decision is taken to deploy an under-reaming drill, which would be lowered down through the monopile. The drill would initially drill out the soil plug within the monopile. The drill continues to drill beyond monopile toe depth scrabbling away the underlying rocks / dense material layer(s) which are causing excessive resistance to pile driving. When the drill has reached the predetermined target depth it is recovered through the monopile. The impact hammer is redeployed on top of the monopile and driving resumes until the monopile is driven to target penetration depth. This DDD cycle may occur more than once as required.
- The drilling and grouting technique requires a large caisson (outer pile) to be pre-installed above the rock layer in order to hold back superficial deposits. This caisson would be installed into the seabed to a depth where its toe was at top of bedrock level using a hydraulic impact hammer. The drill drills through the caisson and into the underlying rock to target depth forming a rock socket under the caisson. The drill is then recovered and the monopile (inner pile) is installed into the socket formed by the caisson and drilled out rock. The annulus between the

monopile and caisson/rock is filled with structural grout to allow load transfer from the monopile into the surrounding soil/rock.

5.2.4.41 Drilling and grouting would require the following sequence of activities in the context of the Proposed Development:

- The caisson is installed into the seabed until its toe is at bedrock level. The installation method for the caisson would be the same as that described for pile installation by impact hammering.

1. The drilling process begins after the drilling machine has been lowered into the top of the caisson. There it is fixed at drilling level with the help of a locking system to keep the drilling machine in its vertical position.
2. The drilling process begins with the activation of the slurry circuit needed to transport the excavated/loosened soil from within the caisson to the surface. At the same time, the cutting wheel starts to rotate. All supply lines as well as data cables and the discharge line are permanently connected to the machine.
3. When the drilling cutters reach the toe of the caisson they proceed to drill into bedrock to the required installation depth.
4. When the final depth is reached, the overcutters are folded in and the locking system is disengaged.
5. The monopile foundation is then lowered into the hole in the seabed formed by the hollowed out caisson and the drilled out bedrock below it.
6. The annulus between the MP and caisson/rock is filled with structural grout to allow load transfer from the monopile into the surrounding soil/rock.

5.2.4.42 Drilling is only employed where the monopile's required target depth for operational design purposes dictates all or some of the foundation needs to penetrate into bedrock. Where there is a thick layer of overburden above bedrock, such as at the Proposed Development, drilling, using either the DDD or drilled and grouted technique would require pile/caisson driving using an impact hammer/vibro hammer as part of the installation process. An impact hammer rather than a vibro hammer would need to be used for this purpose at the Proposed Development. Therefore, drilling is not a satisfactory alternative which would negate the use of impact piling at the Proposed Development (i.e. the activity requiring derogation).

CONSIDERATION OF ALTERNATIVE OF MONOPILE INSTALLATION TECHNIQUES

5.2.4.43 A comparison of the technical considerations associated with each monopile installation technique is presented in Table 5-7. Specific consideration has been given to the ability of each installation technique to support the objectives of the Proposed Activity (i.e. installation of the monopile foundation for the WTGs and OSPs which are fundamental components that are required as part of the Proposed Development) whilst avoiding or materially reducing the disturbance effects that necessitate the derogation application.

5.2.4.44 The technical consideration of each installation technique and its suitability reflects the latest industry knowledge on the availability and maturity of each method. Additionally, consideration of the suitability for the known ground conditions reflects the extensive baseline data that has been gathered through site surveys undertaken offshore to support the Proposed Development.

Table 5-7: Comparison of technical considerations for monopile installation

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Percussive piling (i.e. monopile installation technology being	No – Derogation required.	No - - Disturbance not avoided or reduced as demonstrated herein	Due to ground and environmental constraints the piling option is the

sought pursuant to this derogation licence application)			appropriate technical solution. The monopile foundation has been optimised to deliver against physical and environmental constraints of the site including ground conditions whilst minimising potential deliberate disturbance of Annex IV species.
Vibro Hammering	Yes. Activity requiring derogation would not be required.	Potential to avoid or reduce disturbance.	Not technically feasible (from an engineering perspective) based on the site conditions (i.e. seabed mobility and presence of boulders). Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.
Drilling	Yes. Activity requiring derogation would not be required.	Potential to avoid or reduce disturbance.	Not technically feasible (from an engineering perspective) based on the site conditions and available technology. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.

ALTERNATIVE TIMING AND SEQUENCING

5.2.4.45 The timing and sequencing relates to the scheduling of the activity requiring derogation in the construction programme.

5.2.4.46 The construction programme has been optimised (in response to the RFI) with a reduction from five to four years in order to maintain project delivery timelines. The activity requiring derogation (i.e. foundation installation via piling) is anticipated to occur during Year 2 (months 1 – 12) and Year 3 (months 1 – 6) of the construction programme as described in detail in Section 4.4.5 of Annex A to this document and illustrated in Figure 5.

5.2.4.47 It is also noted that the Applicant has avoided disturbance from concurrent piling for the Proposed Development by committing to one installation per day (i.e. just one pile will be impact hammered in a 24-hour period to a maximum duration of 5 hours and ten minutes).

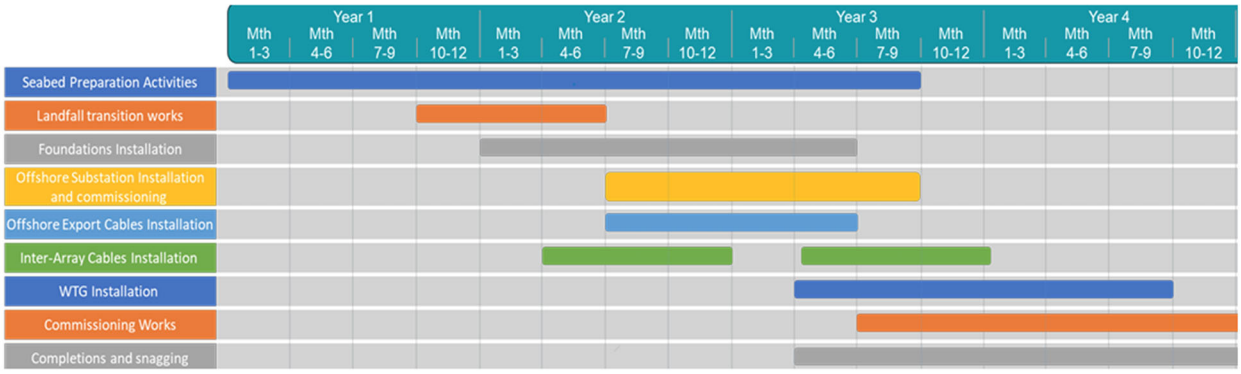

Figure 5: High level construction programme for the Proposed Development

5.2.4.48 The seasonal sensitivities of each species has been summarised in Table 5-8 and been considered. Further detail on seasonality considerations as well as density, abundance estimates and observations throughout the year is presented in Annex H of this document.

Table 5-8: Summary of seasonal sensitivities for Annex IV marine mammals

Species	Seasonality Considerations	Seasonality Observations
Harbour porpoise *(Phocoena Phocoena)*	Birthing during May to August (peaking in June and July) Mating during April to September.	Inshore waters may be important as nursery habitats during summer months (i.e. the breeding season). Seasonal comparisons indicate higher abundance and densities during summer months compared to winter months. Refer to Section 6.2.1.4 in Annex H for further detail.
Bottlenose dolphin *(Tursiops truncatus)*:	Birthing during May to November	The west and southwest of Ireland are more important for the distribution of these species who are known to move inshore, into shallow coastal waters during warmer months, and into offshore, deeper waters during the winter months. However, this pattern could be as a result of both the coastal and offshore ecotypes using these areas. Refer to Section 6.2.2.4 in Annex H for further detail.
Risso's dolphin *(Grampus griseul)*	Birthing during March to June Mating during June to September	In the Irish Sea (in offshore waters) most sighting records were between July and September, and near-shore records off southwest Ireland were obtained primarily between May and August. Historic site-specific boat-based surveys, all sightings were during May, June, and July supporting the evidence above, that this species more commonly occurs inshore in the Irish Sea during the spring/summer months. Refer to Section 6.2.3.4 in Annex H for further detail.
Short beaked common dolphin *(Delphinus delphis)*	Birthing and mating period that runs primarily from May to September.	Records demonstrate a notable increase in numbers in the southern Irish Sea in the autumn and a peak in inshore records during the month of August which suggests that there may be an

		eastward movement along the south coast during autumn and winter. Recent site-specific digital aerial surveys undertaken in 2023-2024 indicate higher density and abundance in winter compared to summer months. Further, the observed peak in March was not reflective of the historic seasonal pattern. Refer to Section 6.2.4.4 in Annex H for further detail.
Minke whale *(Balaenoptera acutorostrata):*	Not known to breed in Irish waters.	Some individuals remain in coastal waters year-round; however, most migrate south during winter months to temperate offshore waters for breeding grounds. Refer to Section 6.2.5.4 in Annex H for further detail.

5.2.4.49 Cumulatively the sensitive periods for the species extend from March to November. It would not be feasible nor proportionate to restrict piling to outside this period, even if such restrictions were theoretically possible. In addition, there remains uncertainty regarding the timing of breeding and calving periods for some cetacean species within the Irish Sea, therefore it is difficult to exclude the potential presence of breeding animals. Doing so would push piling into months with poorer weather and metocean conditions, reduce flexibility, and ultimately increase the total duration of piling activities, thereby increasing overall deliberate disturbance. Furthermore, installation vessels and associated equipment are programmed by the installation contractor in sequence with their full project backlog (i.e. rather than by specification from the Applicant in contracts). As such, it is not possible to define or commit to specific installation dates in advance, as these will shift depending on the progress of other projects at that time. Consequently, limiting piling to outside the sensitive months is not proportionate and neither practicable nor feasible.

5.2.4.50 The Applicant requires flexibility for the timing, scheduling and sequencing of the construction programme (i.e. the activity requiring derogation) to ensure that the supply chain, specifically installation contractors can deliver the Proposed Development. The vessels and equipment for monopile installation are secured years in advance due to the restricted availability and the bespoke nature of the vessel and engineering solutions in the market. If there were to be temporal restrictions, this would put the Proposed Development in a position where it is significantly exposed to both delivery and availability issues and associated commercial viability challenges.

5.2.4.51 The construction programme has been developed taking into account these supply chain dynamics along with the potential for operational downtime (e.g. weather delays, operational limitations etc.) whilst seeking to deliver the Proposed Development as efficiently and effectively as possible to support the national climate targets. Any change to timing and sequence of activities at this stage presents a significant risk; including financial cost impact and potentially indefinite delay to schedule as the planning application that has been made to ACP (and associated assessments that have been undertaken) rely upon undertaking year-round construction.

5.2.4.52 Further, scheduling the activity requiring derogation to avoid potentially sensitive periods between March to November would ultimately lengthen the total duration of the piling campaign over multiple years. This would prolong the period during which Annex IV cetacean species could be exposed to deliberate disturbance and extend the timeframe over which cumulative disturbance effects may occur.

5.2.4.53 Flexibility in the timing and sequencing of activity requiring derogation (i.e. ability to undertake piling at any time during the year) is necessary to ensure the deliverability of the Proposed Development. Any temporal or sequencing limitations may lengthen the overall construction

period, present unacceptable commercial and contractual risk which could render the Proposed Development undeliverable and therefore would not be considered a satisfactory alternative. Further, given the uncertainty in the sensitive periods of some species, if there were temporal restrictions applied, there is no guarantee that it would be effective in avoiding breeding and/or mating periods. Specifically, there remains uncertainty regarding the timing of breeding and calving periods for some cetacean species within the Irish Sea, therefore it is difficult to exclude the potential presence of breeding animals.

Table 5-9: Summary of the consideration of satisfactory alternative timing and sequencing of activities

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Temporal restrictions for activities being sought pursuant to this derogation licence application	No – Derogation still required as foundation installation would still be required.	No - Disturbance not avoided or reduced. Foundation installation would still be required and over a longer duration cumulatively. Further, given the uncertainty in the sensitive periods of some species, the application of temporal restrictions does not guarantee effectiveness in avoiding breeding and/or mating periods.	This would present insurmountable risks (commercial, contractual, legal) to the Proposed Development and jeopardise its deliverability. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented or its' objectives to be achieved.
Timing and sequencing of activities being sought pursuant to this derogation licence application	No - – Derogation still required as foundation installation would still be required.	No - Disturbance not avoided or reduced as demonstrated herein	The construction programme has been optimised to reduce the activity requiring derogation to the greatest extent whilst delivering the Proposed Development and its objectives.

ALTERNATIVE INTENSITY

5.2.4.54 The intensity of activity requiring derogation relates to the energy required to install the foundations (i.e. hammer energy to install the piles).

MAXIMUM HAMMER ENERGY

5.2.4.55 The maximum hammer energy required to install the piles has been determined based on the ground conditions at the site and the associated pile parameters. It is noted that the parameters such as pile diameter and pile penetration depth (and thus maximum hammer energy) depend on location specific water depths and ground conditions, both of which are dynamic and change with time.

5.2.4.56 The maximum hammer energy is unlikely to be required to install each and every pile, however on a precautionary basis, the underwater noise modelling has assumed that the maximum hammer energy would be reached at all piling locations. The piling characteristics for monopiles are presented in Table 5-10.

Table 5-10: Anticipated Monopile piling characteristics

Parameter	53 WTG Option	47 WTG Option	OSPs
Number of Structures	53	47	2
Number of piles requiring piling	53	47	2
Maximum hammer energy (kJ)	3,500	3,500	3,500
Max Soft start energy (kJ) – Ramp Up Mitigation Scenario	825	825	825
Max Soft start energy (kJ) – Extended Ramp Up Mitigation Scenario	400	400	400
Soft start duration (minutes) – Ramp Up Mitigation Scenario	40	40	40
Soft start duration (minutes) – Extended Ramp Up Mitigation Scenario	60	60	60
Maximum strike rate (strikes per minute) – soft start – Ramp Up Mitigation Scenario	0.6 bl/min for 20 minutes followed by 30 bl/min for 20 minutes at the same hammer energy	0.6 bl/min for 20 minutes followed by 30 bl/min for 20 minutes at the same hammer energy	0.6 bl/min for 20 minutes followed by 30 bl/min for 20 minutes at the same hammer energy
Maximum strike rate (strikes per minute) – soft start – Extended Ramp Up Mitigation Scenario	0.6 bl/min for 30 minutes followed by 15 bl/min for 30 minutes at the same hammer energy	0.6 bl/min for 30 minutes followed by 15 bl/min for 30 minutes at the same hammer energy	0.6 bl/min for 30 minutes followed by 15 bl/min for 30 minutes at the same hammer energy
Number of piles impact hammered over 24 hours	1	1	1
Maximum duration of piling per day over construction period (hours)	5 hrs 10 mins	5 hrs 10 mins	5 hrs 10 mins
*Total number of days when piling may occur over construction period	71	63	4

5.2.4.57 Although a hammer energy of 3,500 kJ is considered as the maximum for the purposes of assessment (and thus has been used in the underwater noise modelling on a precautionary basis), the actual energy used when piling will be significantly lower for the majority of the time and locations. The hammer energy is only raised to that maximum value when/if absolutely necessary (i.e. toeing into rock).

5.2.4.58 Alternatives, in the form of different scenarios have been considered (via modelling of different hammer energies) with the iterative refinement to reduce the maximum hammer energy for piling to the greatest extent and incorporate mitigation whilst providing a robust, structurally sound foundation based on ground conditions at that location.

5.2.4.59 Due to the chosen foundation option (i.e. monopile) and ground conditions present, no further reduction in the intensity of activities (i.e. below the specified maximum hammer energy) is technically feasible. Whilst increasing the intensity (i.e. maximum hammer energy) is considered to be unsatisfactory, as it may increase the potential for deliberate disturbance to Annex IV species.

MITIGATION MEASURES

5.2.4.60 Different ramp-up scenarios have also been modelled and an extended ramp-up has been committed to so as to reduce deliberate disturbance (i.e. via a reduction in predicted marine mammal PTS onset ranges to within the r_{Safe} zone and reductions in impact ranges). The Applicant has also avoided disturbance from concurrent piling for the Proposed Development by committing to one installation per day (i.e. just one pile will be impact hammered in a 24-hour period to a maximum duration of 5 hours and ten minutes).

5.2.4.61 Project-specific underwater noise modelling is presented in Annex K of this document. The measures to reduce the intensity of the activity requiring derogation have been developed iteratively in response to the modelling outputs and are detailed in Section 6 of Annex D of this document (the Marine Mammal Mitigation Plan).

5.2.4.62 The Marine Mammal Mitigation Plan has been informed by and considered the DAHG (2014) guidance as well as latest international practice (JNCC, 2023; JNCC, 2025; Danish Energy Agency, 2022). The Marine Mammal Mitigation Plan confirms it is designed to minimise the risk of auditory injury and sets out the combined mitigation package during piling, including a defined mitigation zone, MMO, PAM (where required), acoustic deterrent device (ADD) deployment and a soft-start/ramp-up procedure, and also presents the extended ramp-up mitigation scenario which will be implemented in order to comply with an r_{safe} of 1,000 m, in line with the Danish standard.

5.2.4.63 To ensure best practice has been adopted based on the site conditions, a report (Noise Mitigation Systems - A Targeted Review) has been prepared which is included in Annex O to this document. This report includes a review of underwater noise requirements/thresholds used in other EU jurisdictions (including Denmark and Germany). This report reviewed several jurisdictions, including Germany, which was the first country to establish a legal dB limit in 2013, requiring piling noise to remain below 160 dB re 1 pPa2s SELssor 190 dB re 1 pPa SPLpeak at 750 m, and licences are only granted when predicted noise meets these thresholds. While this model has influenced other jurisdictions, the limits are becoming increasingly difficult to achieve due to larger pile sizes and higher hammer energies, even with the implementation of extensive noise abatement systems. The German approach also relies on fixed source-based limits focused solely on harbour porpoise and does not account for behavioural mitigation or species-specific hearing sensitivity. This makes it unsuitable for the Proposed Development, where there is a wider range of cetacean species with differing auditory thresholds requiring a more considered approach.

5.2.4.64 In all cases piling will commence with a lower prescribed soft-start hammer energy during the 30-minute soft start. This is followed by a period, of up to 147 minutes, where the hammer energy applied is that required for optimum pile advancement to target depth based on the ground conditions at that location.

5.2.4.65 The intensity of activity requiring derogation (i.e. extended ramp up scenario and maximum hammer energies as specified) is necessary to ensure that stable foundations can be installed

for each WTG and OSP. Any further reduction in the intensity would inhibit the construction of the Proposed Development and therefore would not be considered a satisfactory alternative. Accordingly, no satisfactory alternative intensity of activities has been identified that would achieve the objectives of the Proposed Development whilst avoiding, or reducing to an extent that would remove, the need for a derogation.

Table 5-11: Summary of the consideration of satisfactory alternative intensity of activity requiring derogation (i.e. maximum hammer energy)

Description of Alternative	Potential to avoid need for activity requiring derogation	Potential to avoid or reduce disturbance to Annex IV species	Relevant Constraints
Greater intensity of activities (i.e. using higher maximum hammer energy)	No – Derogation still required with potential for deliberate disturbance to a greater extent (i.e. based on a higher maximum hammer energy for pile installation).	No – disturbance would not be avoided or reduced, with potential to a greater extent (i.e. due to higher maximum hammer energy).	Any increase intensity of activities may give rise to greater deliberate disturbance. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented whilst protecting Annex IV species.
Lesser intensity of activities (i.e. using lower maximum hammer energy	No - Derogation still required with potential for deliberate disturbance to a lesser extent (i.e. based on a lower maximum hammer energy for pile installation).	Disturbance would not be avoided but potentially to a lesser extent (i.e. due to a lower maximum hammer energy).	Any further reduction in maximum hammer energy would impact the viability of the Proposed Development as it would not be possible from an engineering perspective (based on the ground conditions) to install the monopiles with a reduced maximum hammer energy. Therefore, not a satisfactory alternative that could allow the Proposed Development to be implemented and its' objectives to be achieved.
Intensity of activities being sought for both Project Design Options	No - Derogation still required as demonstrated herein.	No. - Disturbance not avoided or reduced as demonstrated herein.	The design has been optimised to reduce the intensity of activities to the greatest extent whilst delivering the Proposed Development and its objectives.

5.2.5 Conclusion on Test 2

5.2.5.1 The do-nothing scenario as well as the full range of alternative solutions (in relation to location, scale, design and layout, type, timing and sequencing and intensity of the activity requiring derogation) have been considered. In accordance with the requirements of the NPWS and EC guidance, the Applicant has considered the fundamental questions of relevance to this test and described the problem that needs to be addressed (i.e. construction of the Proposed Development), identified other solutions (i.e. alternative location, scale, design and layout, type of activity, timing and sequencing and the intensity of the activity requiring derogation) and demonstrated how there are no satisfactory alternatives that would resolve the problem that would avoid or materially reduce the deliberate disturbance from the activity requiring derogation.

5.2.5.2 Some of the alternatives do not sufficiently address the problem of installing the foundations of type that is necessary based on the ground conditions at the Proposed Development whilst some alternatives would present viability challenges that would put the Proposed Development in a position where it is significantly exposed to both delivery and availability issues and associated commercial viability challenges which would in turn prevent project delivery and the generation of 800MW of offshore renewable energy. The Applicant is satisfied that the Proposed Development is suitably optimised and that there is no satisfactory alternative for the activity requiring derogation.

5.2.5.3 The Applicant considers that the alternatives have been adequately considered in a clear and objective manner and as evidenced herein, would ultimately not be satisfactory as they would not allow for the constructing/installing the required foundations to support the WTGs and OSPs that are required as part of the Proposed Development. Accordingly, the Applicant is satisfied that there is no satisfactory alternative capable of delivering the objectives of the proposed activity or of the Proposed Development whilst avoiding, or reducing to an extent that would remove, the need for the activity requiring derogation and the associated potential for disturbance of Annex IV cetacean species. As such, the Applicant considers that the evidence herein sufficiently meets Test 2 and supports the granting of the derogation that is required for the Proposed Development.

5.3 Test 3 - Impact of a Derogation on Conservation Status

5.3.1 Overview

5.3.1.1 Favourable Conservation Status (FCS) is a central objective of the Habitats Directive and underpins the strict protection provisions outlined in Regulation 51(2) of the Habitat Regulations afforded to Annex IV species. It reflects the long-term viability of the species within its natural range and provides the benchmark against which potential impacts from human activities are assessed. Under the Habitats Directive, a species is considered to be at FCS when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable element of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

5.3.2 Population(s) at Scale

5.3.2.1 The NPWS (2026) guidance clarifies that FCS should be assessed at an appropriate ecological scale, meaning that it is not just that the individual animals are present, but whether populations continue to function as viable units within healthy ecosystems; thus taking account of natural variability in population size, habitat quality, and species distribution.

5.3.2.2 Information on Annex IV species' distribution and abundance within the vicinity of the Proposed Development was collated through a detailed review of existing studies and datasets including site specific surveys undertaken between 2000 to 2025. This has been documented in Section 4 which presents the details of the local, national and biogeographical scale including all evidence gathered and reviewed to characterise the baseline based on best scientific knowledge.

5.3.2.3 Tables 11.4 and 11.5 in Annex E of this document identifies the data sources of relevance whilst Table 11.7 in Annex E documents that the densities have been established from a range of sources, including site-specific DAS (carried out from 2018 to 2020 with additional surveys from 2023 to 2025), SCANS-IV, SCANS-III, ObSERVE surveys, and IWDG boat-based surveys. The most appropriate and robust densities have been taken forward for assessment in this derogation licence application in accordance with the requirements of the NPWS and EC guidance.

5.3.2.4 Specifically, the site-specific DAS have been used as the most appropriate densities for estimating impacts within the Marine Mammal Study Area and Extended Marine Mammal Study Area, and SCANS have been used as the most appropriate for the Marine Mammal MU Study Area. These datasets provide the latest and best available density estimates due to their appropriate spatial coverage, robust methodology and alignment with current best practice for marine mammal impact assessments.

5.3.2.5 These density estimates have been used to calculate the number of animals predicted to be disturbed during the activity which require a derogation (i.e. piling). This number is then assessed as a proportion of the relevant Management Unit (MU) population (see Paragraph 11.9.1.57 *et seq.* of Annex E of this document.

5.3.2.6 Accordingly, the assessment has been undertaken using the best available scientific evidence and at the ecological scales most relevant to determining whether the Proposed Development could adversely affect the FCS of Annex IV marine mammal populations at the local, national or biogeographical level.

5.3.3 Assessment in Relation to FCS

5.3.3.1 The following sections address each of the relevant parameters in relation to FCS and demonstrate how the activity requiring derogation, and any derogation licence itself if granted, will not alter or deteriorate the conservation status of the relevant Annex IV species.

5.3.3.2 This assessment has undertaken a two-step approach, in accordance with paragraph 3-62 of the EC guidance (2021):

> *"Implementation of this provision should include a two-step assessment: firstly, to assess the conservation status of the specific populations of a species in its natural range within the Member State concerned (and possibly beyond national boundaries if the populations are shared with neighbouring countries) and, secondly, an evaluation of the impact of the derogation on the conservation status of the specific population or populations concerned."*

CONSERVATION STATUS IN SPECIES' NATURAL RANGE WITHIN THE MEMBER STATE

5.3.3.3 All cetacean species listed in Annex IV, apart from harbour porpoise, are assessed as having an overall FCS in Irish waters under the Article 17 reporting (NPWS, 2025). Common dolphin, bottlenose dolphin, Risso's dolphin and minke whale were all assessed as having a favourable range, population, habitat for the species, and future prospects (NPWS, 2025). Harbour porpoise are assessed as having an inadequate conservation status, due to uncertainty in the population, however the range and habitat for the species remain favourable (NPWS, 2025).

5.3.3.4 Due to the proximity of the Proposed Development (and activity requiring derogation) to the UK, there is a need to consider the conservation status in UK waters as populations are likely to be shared across national boundaries. A conservation status assessment within UK waters concluded a favourable conservation status for common dolphin (JNCC *et al.*, 2026a), bottlenose dolphin (JNCC *et al.*, 2026b), and Risso's dolphin (JNCC *et al.*, 2026c). However, assessments for harbour porpoise (JNCC *et al.*, 2026d) and minke whale (JNCC *et al.*, 2026e) concluded an unfavourable–inadequate conservation status within UK waters.

IMPACT OF THE DEROGATION ON THE CONSERVATION STATUS

5.3.3.5 In accordance with the EC Guidance (2021), the impact of the specific derogation has been considered "at a lower level than the biogeographic region" as follows:

- For minke whale, common dolphin and Risso's dolphin the assessment has been undertaken at the MU-level, which is UK-wide, and therefore smaller than the entire biogeographic region across the EU.

- For harbour porpoise, the assessment has been undertaken at the MU-level, which encompasses the Celtic and Irish Seas, and is therefore smaller than the entire biogeographic region across the EU.
- For bottlenose dolphin, the assessment has been undertaken at the MU-level, which encompasses the Irish Sea, and is therefore smaller than the entire biogeographic region across the EU.
- For all of these species, this is lowest level at which a population for the species has been defined, for the purpose of undertaking an assessment or applying management (IAMMWG, 2023).
- Furthermore, it is noted that there are no defined local populations for any of these species that overlap with the Proposed Development.

FOUNDATION INSTALLATION

5.3.3.6 A dose response approach has been used to calculate the likely number of animals within the disturbance area from the activity that requires derogation (i.e. piling), as presented in Table 5-12 of this document and Annex S to this document.

Table 5-12: Predicted impact of disturbance to marine mammals from pile driving using dose-response curves (orange) and Level B harassment thresholds (blue) with the extended ramp up mitigation scenario; # = number of animals disturbed; % = the percentage of the reference population

Species	Density	Impact	Piling Location				
			N WTG 11 m	C WTG 11 m	SW WTG 11 m	N-OSP 11 m	S-OSP 11 m
Harbour porpoise	0.38	#	1,456	1,908	1,753	1,270	1,109
		%	2.33	3.05	2.80	2.03	1.77
Common dolphin	0.0272	#	21	30	30	18	16
		%	0.02	0.03	0.03	0.02	0.02
Bottlenose dolphin	0.0201	#	16	23	23	14	12
		%	5.46	7.85	7.85	4.78	4.10
	0.2352	#	179	259	259	153	132
		%	61.09	88.40	88.40	52.22	45.05
		%*	2.15	3.12	3.12	1.84	1.59
Risso's dolphin	0.031	#	24	35	35	21	18
		%	0.20	0.29	0.29	0.17	0.15
Minke whale	0.045	#	35	50	50	30	26
		%	0.17	0.25	0.25	0.15	0.13

Source: SCANS-IV density estimates / SCANS-III density estimates / ObSERVE estimates used in calculations from Gilles *et al.* (2023), Hammond *et al.* (2021) and Rogan *et al.* (2018)

*Secondary bottlenose dolphin reference abundance from SCANS-IV (Gilles *et al.*, 2023), provides estimates from Block CS-D at 8,326 rather than 293 from MU populations in IAMMWG (2023) to provide more realistic populations relevant to the Proposed Activities

5.3.3.7 Based on the highest density estimates for harbour porpoise, 3.05% of the MU population may be disturbed from each piling event, equivalent to up to 1,908 individuals. Level B harassment thresholds were used to assess disturbance in this application, for bottlenose dolphin, common dolphin, Risso's dolphin and minke whale. Based on the maximum density estimate for bottlenose dolphin, 259 individuals may be disturbed from each piling event. This equates to 3.12% of the most robust reference population estimate. For common dolphin, Risso's dolphin and minke whale, less than 1% may be disturbed from each piling event, equivalent to 30, 35 and 50 individuals, respectively. The consequence of the effect is expected to be low and so unlikely to cause any long term population effect.

5.3.3.8 These numbers correspond to the maximum representative number of animals that may be disturbed in accordance with the precautionary principle. They have not been quantitatively reduced to account for some mitigation measures (specifically avoidance and deterrent-based measures), as it is extremely difficult to predict the number of animals that may be disturbed by the piling activity after the application of these measures. There are uncertainties relating to the ability to predict the exposure of animals to underwater noise, as well as in predicting the response to that exposure. The high spatial and temporal variation in marine mammal abundance and distribution in any area makes it difficult to predict how many animals may be present within the range of noise impacts. As a result, all methods for determining at-sea abundance and distribution suffer from a range of biases and uncertainties.

5.3.3.9 Furthermore, limited empirical data is available to inform predictions relating to the extent to which animals may experience auditory damage or display responses to noise. The current methods for predicting behavioural responses are based on received sound levels, but it is likely that factors other than noise levels alone will also influence the probability of response and the strength of response, such as previous experience, behavioural and physiological context, proximity to activities, duty cycle and pulse characteristics of the sound. However, it is not possible to adequately take these factors into account when predicting a behavioural response at present. This assessment makes use of the monitoring work that has been carried out during the construction of the Beatrice offshore windfarm and therefore uses the most recent and site-specific information on disturbance to harbour porpoise because of pile driving noise (Graham et al., 2017; Graham et al., 2019). Furthermore, given the high spatial and temporal variation in marine mammal abundance and distribution in any particular area of the sea, it is difficult to predict how many animals may be present within the range of noise impacts (and so could experience deliberate disturbance).

5.3.3.10 However, these uncertainties are acknowledged and a precautionary approach has been adopted to ensure a robust assessment based on best scientific knowledge and evidence in accordance with the relevant guidance.

5.3.3.11 The potential for foundation installation to affect chances of survival, breeding success or reproductive ability, can be informed by the population modelling undertaken for the Proposed Activities, using iPCoD which is provided in Annex L of this document. The population modelling was conducted to determine whether the level of disturbance from foundation installation (specifically pile-driving) is expected to result in population-level impacts. The iPCoD Modelling was conducted under the original ramp-up mitigation scenario, which doesn't have an extended ramp up and has a higher maximum energy of 6,000 kJ. The results of the population modelling showed that there is no significant effect of disturbance from pile driving at the Proposed Development to the populations of harbour porpoise, bottlenose dolphin, and minke whale (the species for which iPCoD modelling is possible to undertake). For harbour porpoise, the impacted population is predicted to continue at a stable trajectory never falling below 99.89% compared to the mean un-impacted population. For bottlenose dolphin, the mean impacted population size initially decreases very slightly as compared to the mean un-impacted population size in response to piling. However, shortly after piling the impacted population continues on the same, stable trajectory never falling below 98.09% of the mean un-impacted population size. Furthermore, for

minke whale, impacted population is predicted to continue at a stable trajectory at exactly the same size as the un-impacted population. The Applicant concludes that the foundation installation will not affect chances of survival, breeding success or reproductive ability to the extent that it leads to a change to the species' population.

5.3.3.12 It is highlighted that the population modelling provided in Annex L to this document was undertaken at the time of submission of the planning application (June 2024) and so is based on Project Design Option parameters that have since been refined further (i.e. the maximum hammer energy has been reduced, there are fewer WTGs and associated piles required etc.). Specifically, the modelling was conducted under the original ramp-up mitigation scenario, which doesn't have an extended ramp up and thus has a higher maximum energy of 6000 kJ. The revised piling parameters remain within the overall range assessed in the iPCoD modelling and thus the modelling outputs are valid for the purposes of assessment and are considered precautionary, as they are based on a scenario that reflects equal or greater impact potential than the activities which are described in Section 3 and the design which is detailed in Annex A of this document.

5.3.3.13 Cetaceans are highly mobile and wide-ranging, therefore the most appropriate level to consider impacts against is the regional population (i.e. the MU), in the absence of defined local populations. The MU is considered a subset of the population in their natural range delineated for management purposes. In contrast, the FCS test, for the purpose of this derogation licence application, refers to the populations in their natural range. The natural range of the relevant cetacean species to this licence application (i.e. harbour porpoise, bottlenose dolphin, minke whale, Risso's dolphin and common dolphin) is significantly greater than their respective MUs. Therefore, based on the precautionary modelling approach and underwater noise assumptions used to inform the assessment, and considering the scale of potential effects, the proposed activities will not adversely affect the conservation status of these species. Behavioural displacement and disturbance from the activity requiring derogation (i.e. piling) is determined to have Slight adverse impact significance, which is not significant in EIA terms. This determination takes into account the mitigtation measures and additional mitigation measures where possible. In particular, the activity requiring derogation (i.e. piling) will be undertaken in accordance with the measures presented in this document. No ecologically significant adverse residual effects have been predicted in respect to Annex IV cetacean species.

5.3.4 Proposed Mitigation Measures

5.3.4.1 The NPWS Guidelines state that:

"*mitigation measures include sufficient detail to demonstrate to the NPWS that the measures will be undertaken according to best practice standards and, wherever possible, have been undertaken in similar circumstances with positive results. Reference to evidence for success such as the Conservation Evidence database may help to provide such evidence*."

MITIGATION MEASURES IN THE CONTEXT OF BEST PRACTICE

5.3.4.2 The Applicant has committed to mitigation measures to avoid or reduce impacts caused by the proposed activity. In summary, the Applicant has committed to the implementation of a marine mammal mitigation zone, monitoring using MMOs during daylight hours, and ramp-up procedures, that adhere to DAHG (2014) guidelines. In addition, the Applicant is committed to using PAM prior to the start-up of piling at night-time and poor visibility, and the use of an ADD prior to all foundation installation.

5.3.4.3 The Marine Mammal Mitigation Plan has been informed by and considered the DAHG (2014) guidance as well as latest international practice (JNCC, 2023; JNCC, 2025; Danish Energy Agency, 2022). The Applicant notes that DAHG (2014) guidance is in the process of being updated to reflect advancements in scientific knowledge since the time of publication, however it is currently the only national guidance available in relation to underwater noise and marine

mammals and therefore has been used to inform the Marine Mammal Mitigation Plan. The measures will be kept under review and updated, as necessary, prior to the commencement of piling to ensure they align with the latest guidance and scientific evidence.

5.3.4.4 The Marine Mammal Mitigation Plan confirms it is designed to minimise the risk of auditory injury and sets out the combined mitigation package during piling, including a defined mitigation zone, MMO, PAM (where required), ADD deployment and a soft-start/ramp-up procedure, and also presents the extended ramp-up mitigation scenario which will be implemented in order to comply with an r_{safe} of 1km, in line with the Danish standard.

5.3.4.5 It is acknowledged that the Marine Mammal Mitigation Plan (Annex D of this document) proposes some measures, specifically PAM and ADDs, which are deviations from the advice outlined in DAHG (2014). However, both PAM and ADDs have been significantly developed since the publication of the DAHG guidance in 2014, and are now included in industry-standard mitigation guidance documents that have been more recently published by government agencies (such as by JNCC in the UK; JNCC, 2023; JNCC, 2025a). As a result, both PAM and ADDs are implemented as industry standards during foundation installation in other regions such as the UK. Therefore, the Applicant considers that these are appropriate measures for the Proposed Development based on professional judgement, and represent current industry best practice.

5.3.4.6 The following section outlines the marine mammal mitigation measures proposed for the activity requiring derogation (i.e. piling) and describes how these align with current best practice.

MMOS

5.3.4.7 The MMO will carry out observations and monitoring prior to the commencement of the activity requiring derogation in accordance with the DAHG (2014) guidance. The DAHG (2014) requires a minimum 30-minute pre-piling search, carried out by a trained MMO positioned to provide full 360° visual coverage of the Marine Mammal Mitigation Zone (MMMZ). The purpose of this search is to maximise the likelihood of detecting marine mammals within the MMMZ prior to the start of piling. If a marine mammal is detected within the MMMZ during the pre-piling search, the piling will be delayed until it has been confirmed that the individual(s) has vacated the MMMZ, and there have been no detections for at least 20 minutes. This will ensure, as far as possible, that marine mammals are outside of the MMMZ and therefore outside of the zone of greatest impact prior to the start of the activity requiring derogation (piling).

PAM

5.3.4.8 The PAM Operator will carry out PAM prior to the commencement of the activity requiring derogation. PAM provides an effective complement to MMO visual monitoring in periods of poor visibility. It is also the only method regularly used at night (JNCC, 2023). The purpose of PAM is the same as for visual monitoring, in that it will be used to monitor the MMMZ and reduce the risk of marine mammals being within the MMMZ prior to commencement of the activity requiring derogation (piling). It has been routinely used as mitigation in jurisdictions using the JNCC Guidelines (principally the UK, although also adopted in other countries where there are no country-specific guidelines), and has been used since 2002 in the UK (JNCC, 2023).

RAMP UP

5.3.4.9 The extended ramp up scenario will be implemented as part of the commencement of the activity requiring derogation. DAHG (2014) states that an appropriate ramp-up procedure must be used when commencing pile driving where the output peak sound pressure level (in water) from any source including equipment testing exceeds 170 dB re: 1µPa @1m. This low-energy start will also have benefits for marine mammals in that they are exposed to comparatively low-level sound that can encourage them to flee the area before hammer energies increase and have greater

potential to cause auditory impacts. The incremental increase in energy at the start of piling is referred to as a “ramp-up”.

5.3.4.10 In accordance with DAHG (2014) the Applicant has committed to an R_{safe} of 1 km, through the implementation of an extended ramp-up at the commencement of the activity requiring derogation. The parameters of this ramp up scenario are detailed in Table 5-10 and this has been considered accordingly herein and in the associated modelling which underpins this application.

ACOUSTIC DETERRENT DEVICES (ADDS)

5.3.4.11 The ADD Operator will deploy an ADD prior to the commencement of the activity requiring derogation. One ADD will be deployed from the deck of the pilling vessel with enough cable length to allow the transducer to be positioned under the hull. This will ensure that the acoustic signals emitted by the ADD are not blocked by the hull of the vessel, and can propagate fully in the water column.

5.3.4.12 The ADD will be activated for a 20minute period to ensure that individuals are displaced beyond – the time of deployment has been determined via modelling based on time it would take for a marine mammal to flee beyond the distance of PTS-onset, using both the SPL_{peak} and SEL_{Cum} metrics (refer to Section 1.2 of Annex D of this document for further detail).

5.3.4.13 ADDs are routinely used prior to piling in OWF, with a large body of evidence available to demonstrate their effectiveness in deterring marine mammals away from mitigation zones (McGarry et al., 2022; Phillips et al., 2025). Regarding the effectiveness of deterrent technologies, and specifically ADDs, the Lofitech seal scarer appears to be the most effective at deterring marine mammals over longer distances. Research at the DanTysk Offshore Wind Farm showed that the Lofitech ADD successfully repelled harbour porpoises up to 12 km away, though it was most effective within a 1.5–3 km radius, where acoustic monitoring noted a major drop in activity (Dähne et al., 2017). Similarly, additional studies found the device effective up to a maximum range of 9 km, with typical deterrence occurring between 7 and 9 km (Graham et al., 2023).

5.3.4.14 The Lofitech ADD has been shown to alter behaviour of minke whale up to 1 km (McGarry et al., 2017) and 1.5 km (Boisseau et al., 2021) from the sound source. McGarry (2017) found when fleeing away from the sound, the swimming speed increased by 7.4 km/h (2m/s) and the directness at which the animal was travelling away was maintained with minke whale that were exposed to the Lofitech ADD observed swimming up to 4.5 km away from the device within approximately 50 minutes of activation (Figure 3.3 in McGarry et al., 2017).

APPLICANT’S EXPERIENCE FROM COMPARABLE PROJECTS

5.3.4.15 The Applicant has considerable experience implementing mitigation measures to minimise impacts (including deliberate disturbance) to marine mammals for comparable offshore wind farm projects. In terms of the Applicant’s experience with the activity requiring derogation, Table 5-13 presents a list of projects, foundation type and mitigation measures that have been employed by the Applicant across their portfolio of projects:

Table 5-13: Applicant experience with mitigation measures for activity requiring derogation (piling)

Project	Foundation type	Year foundations installed	Mitigation measure
Greater Gabbard	Monopile	2009 - 2010	Mitigated ramp-up
Beatrice	Jacket with pin piles	2017 - 2018	Mitigated ramp-up and ADD
Seagreen	Jacket with pin piles (OSP only)	2022	Mitigated ramp-up and ADD
Dogger Bank A	Monopile	2022 -2023	Mitigated ramp-up and ADD
Dogger Bank B	Monopile	2024 -2025	Mitigated ramp-up and ADD
Dogger Bank C	Monopile	2025	Mitigated ramp-up and ADD

5.3.4.16 Dogger Bank C is the most recent project where the Applicant has been involved in monopile installation using impact hammering and is a useful reference given a similar approach to noise mitigation was employed as is committed to for the Proposed Development. This project was also subject to Marine Wildlife Licence (also known as European Protected Species licence) for disturbance associated with piling for the WTGs and OSPs in accordance with the provisions of the Habitats Directive and transposing Conservation of Habitats and Species Regulations 2017, the Conservation of Offshore Marine Habitats and Species Regulations 2017, and the Conservation of Habitats and Species (Amendment) (European Union Exit) Regulations 2019.

5.3.4.17 The mitigation for Dogger Bank C, as per the MMMP, consisted of visual and acoustic (during the hours of darkness and poor visibility) monitoring, deployment of an ADD, a soft-start (low-energy blows and ramp-up (gradual increase in hammer energy)), before piling at full hammer energy commenced.

5.3.4.18 A recent publication (Matei et. al, 2026) presents the results of a monitoring campaign undertaken during piling on Dogger Bank C which employed an array of 27 PAM moorings deployed across an area up to 55 km from piling locations. This study estimated an Effective Deterrence Range (EDR) of 14.4 km for harbour porpoise at Dogger Bank C which is within the reported range of EDRs estimated for unabated piling at other offshore wind farms in the North Sea, and close to the lower bound of the 15-20 km range recommended for unabated piling in a recent review of data.

5.3.4.19 The following extract (Matei, 2026) details the piling methodology employed at Dogger Bank C which is very similar to that committed to for the Proposed Development:

"For each monopile, an acoustic deterrent device (ADD, Lofitech seal scarer) was activated for 29 minutes prior to the start of piling and after any breaks in piling exceeding two hours… Piling commenced with a soft start lasting a minimum of 20 minutes, split into two phases. The initial phase was 5 minutes in duration and limited to 1 hammer blow/min and a hammer energy of ≤ 400 kJ. This was followed by 15 minutes at 30 blows/min and hammer energy of ≤ 880 kJ. Following the soft start, the hammer energy ramped up into the remainder of the unbated piling

in which a steady pile penetration rate was maintained until work was completed (assuming no breaks were required). Overall, the average maximum hammer energy maintained during pile driving per foundation installation was 2102.7 kJ (range: 887.0 – 4132.0 kJ, n = 72 piles). No noise abatement systems (NAS) were used during the piling campaign"

5.3.4.20 The results of the Dogger Bank C study are similar to a recently published study which employed very similar monitoring techniques. The study from Benhemma-Le Gall et al., (2024) analysed harbour porpoise response to the installation of XXL monopiles (i.e. 9.5 m – 10 m diameter) without noise abatement systems in the three days prior to, and 24 hours after pile installation, at Moray West OWF in the Moray Firth, Scotland. The outcome of the Moray West study was an observed EDR of 9.4 km.

5.3.4.21 It is considered that mitigation implemented as part of Dogger Bank C piling campaign was sufficient to mitigate for permanent auditory damage to marine mammals, with no marine mammals sighted during the piling campaign. The piling campaign was successfully completed with mitigation measures effectively implemented as demonstrated by Annex Q and Annex R of this document.

5.3.4.22 Beatrice Offshore Wind Farm is another useful reference for a similar approach (pursuant to a licence) to noise mitigation was employed as is committed to for the Proposed Development. The mitigation, as per the MMMP, consisted of visual and acoustic monitoring, deployment of an ADD, a soft-start (low-energy blows and ramp-up (gradual increase in hammer energy)), before piling at full hammer energy commenced.

5.3.4.23 The following extract details the piling implementation report employed at Beatrice Offshore Wind Farm, (Beatrice Offshore Wind Farm Ltd, 2018) which is similar to those committed for the Proposed Development.

"During the full soft starts, the first blows were followed by the incremental increase in hammer energy not exceeding 500 kJ over a period of not less than 20 minutes" …"The Development was consented on the basis that the maximum hammer energy required to install a pile could be up to 2,300 kJ as set out in the ES/SEIS" …"The results of the full geotechnical investigation predicted that for most asset locations, a maximum hammer energy of I ,200 kJ would be required for installing the piles, with only one location where the maximum hammer energy of 2,300 kJ was predicted".

5.3.4.24 The Beatrice Offshore Wind Farm Piling Report (Beatrice Offshore Wind Farm Ltd, 2018) demonstrated that there were no vocalisations recorded using PAM and or sightings recorded by MMOs prior to or during the piling soft start. In addition, there were no incidental or casual observations of marine mammals in the development site during piling activity. It was therefore concluded that the risk of animals being within a range that would result in death or injury was negligible. This demonstrates that the piling campaign was successfully completed with mitigation measures effectively implemented.

5.3.4.25 These project examples and associated documentation demonstrate the Applicant's considerable experience in delivering large-scale offshore wind projects involving impact piling and implementing mitigation measures designed to minimise deliberate disturbance to marine mammals. The implementation of these measures across multiple large-scale offshore wind projects demonstrates that they are recognised as established and appropriate mitigation measures and are consistent with current industry best practice. Therefore, the Applicant is confident in the effectiveness and practical implementation of the proposed mitigation measures.

NET EFFECT ON CONSERVATION STATUS

5.3.4.26 The NPWS (2026) Guidelines requires *"The effect of mitigation on the impact of the activity on the conservation status of the species"* and *"Clear Explanation as to how the proposed mitigation will lead to neutral or net positive effects on the populations of the species concerned*".

5.3.4.27 Piling activities during foundation installation is the only activity for which a derogation is sought. Table 5-14 summarises the mitigation measures that will be implemented during the activity requiring derogation and describes how these measures contribute to reducing impacts on annex IV listed marine mammals such that the FCS of the populations concerned is maintained.

Table 5-14: Marine Mammal Mitigation Measures for Impact Piling Activities

Mitigation Measure	Description	Purpose	Contribution to Test 3 (Favourable Conservation Status)
Marine Mammal Mitigation Zone (MMMZ)	A 1,000 m mitigation zone (R_{safe}) established around the piling location prior to commencement of piling operations.	To identify marine mammals that may be at risk of injury or significant disturbance within a buffer of the activity requiring derogation.	The MMMZ will reduce the potential for deliberate disturbance by ensuring that piling does not commence in the presence of any individual within 1km. The activity requiring derogation will commence when the MMO has observed, assessed and confirmed that the individual(s) has vacated the MMMZ, and there have been no sightings for at least 20 minutes. Therefore, reducing the potential for injury and supporting maintenance of population viability.
Marine Mammal Observer (MMO) Monitoring	Dedicated MMO(s) undertake visual monitoring of the MMMZ before and during piling operations.	To detect marine mammals and trigger mitigation where required. This includes delaying the activity requiring derogation (i.e commencement of the extended ramp up procedure) until the MMO has observed, assessed and confirmed that the individual(s) has vacated the MMMZ, and there have been no sightings for at least 20 minutes.	The MMO will provide a precautionary mechanism to identify presence of any individual(s) listed on Annex IV and avoid exposure of animals to the activity requiring derogation (specifically piling noise levels capable of causing injury).
Passive Acoustic Monitoring (PAM)	PAM deployed during periods of poor visibility or darkness when visual monitoring effectiveness is reduced.	To detect vocalising marine mammals during periods of low visibility, and to trigger mitigation measures. This includes delaying the soft-start procedure until there have been no vocalisations for at least 20 minutes.	PAM will reduce uncertainty in the detection of vocalising individual(s) listed on Annex IV during periods of poor visibility and strengthens the effectiveness of mitigation measures, reducing the potential exposure of animals to the activity requiring derogation (specifically reducing the likelihood of auditory injury to marine mammals that are not visible to the MMO).
Pre-Piling Monitoring Period	Monitoring undertaken for a minimum period prior to piling commencement.	To increase confidence that marine mammals are not present within the MMMZ before piling starts. If animal(s) are observed within the MMMZ during pre-piling monitoring, the soft-start	This will minimise the likelihood of animals being exposed to the highest sound levels at commencement of the activity requiring derogation.

		procedure will be delayed until the individual(s) has vacated the MMMZ, and there have been no sightings for at least 20 minutes.	
Delayed Start Procedures	Piling delayed if marine mammals are detected within the MMMZ until the required clearance period has elapsed.	To allow individual(s) listed on Annex IV to move away voluntarily from the location of the activity requiring derogation.	Whis will avoids or minimises direct exposure of animals to injury-risk sound levels (i.e. individual(s) listed on Annex IV exposed to the activity requiring derogation).
Acoustic Deterrent Device (ADD)	ADD deployed before commencement of piling to encourage marine mammals to move away from the area of highest noise exposure.	To reduce the likelihood of . individual(s) listed on Annex IV being present within injury-risk zones prior to the commencement of the activity requiring derogation.	This will significantly reduce the potential for auditory injury to any individual(s) listed on Annex IV and supports the conclusion that auditory injury effects are not expected from the activity requiring derogation.
Soft Start / Ramp-Up Procedure	Piling commences at reduced hammer energy and gradually increases to operational energy over a defined period.	To provide an opportunity for individual(s) listed on Annex IV to move away from the location of the activity requiring derogation before peak sound levels occur.	This will reduce the risk of sudden exposure and minimises the likelihood of injury to any individual(s) listed on Annex IV from the activity requiring derogation.
Extended Ramp-Up for Foundation Installation	Gradual increase from initial hammer energy to full operational energy over an extended period.	To maximise avoidance opportunities for individual(s) listed on Annex IV.	This will further reduce the risk of injury and minimise the number of any individual(s) listed on Annex IV exposed to the activity requiring derogation (i.e. animals potentially exposed to higher sound levels), supporting the maintenance of favourable conservation status.
Break-in-Piling Protocols	Additional mitigation applied following extended breaks in piling operations, including renewed monitoring and mitigation procedures.	To account for individual(s) listed on Annex IV potentially re-entering the MMMZ during operational pauses in the activity requiring derogation.	This will maintain effectiveness of mitigation throughout the activity requiring derogation (i.e. piling campaign), and reduce the risk of animals re-entering the MMMZ following periods of operational pauses during the construction programme.
Recording of Marine Mammal observations and mitigation during piling works	Recording of marine mammal observations and mitigation implementation during pre-piling search.	To verify compliance and provide evidence of effectiveness.	This will support adaptive management and provides additional confidence that population-level effects will not occur.
Reporting and Compliance Requirements	Comprehensive recording of observations, mitigation actions, delays and piling activity.	To demonstrate implementation of mitigation commitments.	This will provide evidence that measures have been implemented and maintained throughout the activity requiring derogation.

5.3.4.28 The residual effect following the implementation of mitigation measures is limited to temporary behavioural disturbance from the Proposed Development, which the population-level assessment and iPCoD modelling (included in Annex L of this document) demonstrate will not adversely affect population viability, future prospects, natural range or the achievement of favourable conservation status. The mitigation measures outlined herein and summarised in Table 5-14 are primarily aimed at reducing the risk of injury. It is the Applicant's view that injury should be considered a subset of disturbance under the Habitats Directive, therefore mitigation to reduce the risk of injury is beneficial in reducing this specific form of disturbance. Therefore, the number of individual(s) listed on Annex IV potentially affected by the activity requiring derogation is reduced to a level that is not expected to result in measurable effects on population abundance, distribution or long-term viability.

5.3.4.29 Accordingly, the mitigation measures ensure that the effects of the activity requiring derogation are reduced to a level where the activity will have a neutral effect on the conservation status of the populations concerned. While the mitigation measures are not expected to generate a net positive population outcome, they are sufficient to avoid adverse effects on population abundance, viability, range, habitat availability and future conservation prospects. Therefore, the derogation will not prejudice the maintenance of the species at FCS in their natural range.

5.3.4.30 Accordingly, the assessment concludes there will no effect on the FCS of common dolphin, bottlenose dolphin, Risso's dolphin, nor will it adversely affect the conservation status of harbour porpoise and minke whale.

JUSTIFICATION FOR AN OVERALL CONSERVATION STATUS OF NOT FCS

OVERVIEW

5.3.4.31 The conservation status of harbour porpoise has been assessed as in-adequate in Irish waters and unfavourable-inadequate in UK waters. The conservation status of minke whale has been assessed as favourable in Irish waters, but unfavourable-inadequate in UK waters, which represents part of their natural range.

5.3.4.32 The NPWS (2026) guidance states: *"Note that if the conservation status of the concerned species is not favourable, this Test can only be met if it is justified as being under exceptional circumstances and only if the conservation status will not deteriorate and its restoration at a favourable status is not prevented by undertaking the activity."*

5.3.4.33 As set out under Test 1 in Section 5.1, the Proposed Development constitutes infrastructure of overriding public interest and therefore represents the exceptional circumstances required by the guidance.

5.3.4.34 Accordingly, consideration has been given to whether the activity requiring derogation (i.e. piling) could result in a deterioration of the conservation status of harbour porpoise and minke whale, where conservation status is identified as not favourable within all or part of their relevant range, or prevent their restoration to FCS.

HARBOUR PORPOISE

5.3.4.35 Harbour porpoise is currently reported as having an overall conservation status of inadequate in Irish waters due to uncertainty in the population and Unfavourable–Inadequate in UK waters. The assessment therefore considers not only whether the activity requiring derogation would cause deterioration of conservation status, but also whether it could hinder restoration toward FCS.

5.3.4.36 Temporary behavioural disturbance associated with activity requiring derogation is not predicted to result in mortality, injury, reduced reproductive success, reduction in survival or measurable population decline. The assessment that has been presented in Paragraph 11.9.1.57 of Annex E

of this document, and demonstrates that disturbance impacts on harbour porpoise are expected to be recoverable, occur relatively frequently throughout the construction phase, are reasonably expected to occur, and have intermittent and temporary consequences but are very unlikely to affect the population trajectory.

5.3.4.37 Population modelling that has been presented herein and detailed in Annex L of this document indicates no biologically meaningful change in abundance trends or population viability.

5.3.4.38 Consequently for harbour porpoise, the activity requiring derogation will not affect the ability of the populations to maintain themselves on a long-term basis as a viable component of their natural habitats. The natural range of the species will not be reduced, either now or in the foreseeable future, and sufficient habitat will remain available to support the species on a long-term basis. Therefore, the activity requiring derogation will neither deteriorate the conservation status of harbour porpoise nor impede the achievement or restoration of FCS.

MINKE WHALE

5.3.4.39 Minke whale currently have FCS in Ireland under Article 17 EU Habitats Directive, with a stable population trend (NPWS, 2025). They are listed as Least Concern on the IUCN Red List. However, the current conservation status for minke whale within UK waters is unfavourable-inadequate (JNCC *et al.*, 2026e). The assessment therefore considers not only whether the activity requiring derogation would cause deterioration of conservation status, but also whether it could hinder restoration toward FCS.

5.3.4.40 Temporary behavioural disturbance associated with the activity requiring derogation is not predicted to result in mortality, injury, reduced reproductive success, reduction in survival or measurable population decline. The assessment has demonstrated that disturbance on minke whale are expected for a small proportion of the population with change expected to be recoverable, impacts to occur relatively frequently throughout the construction phase, and have intermittent and temporary consequences but is very unlikely to affect the population trajectory. Further, the disturbance is only relevant during spring and summer months due to the seasonal presence of minke whales.

5.3.4.41 Population modelling that has been presented herein and detailed in Annex L of this document indicates no biologically meaningful change in abundance trends or population viability.

5.3.4.42 Consequently for minke whale, the activity requiring derogation will not affect the ability of the populations to maintain themselves on a long-term basis as a viable component of their natural habitats. The natural range of the species will not be reduced, either now or in the foreseeable future, and sufficient habitat will remain available to support the species on a long-term basis. Therefore, the activity requiring derogation will neither deteriorate the conservation status of minke whale nor impede the achievement or restoration of FCS.

5.3.5 Conclusion on Test 3

5.3.5.1 In relation to Test 3, it can therefore be concluded that:

- Disturbance from the activity requiring derogation will not affect the maintenance of the species on a long-term basis as a viable component of its natural habitat, as no changes to the population size or trajectory over a generational scale have been predicted.
- Disturbance from the activity requiring derogation will not reduce nor is likely to reduce the natural range of the species for the foreseeable future, as any change in distribution is predicted to be temporary, and would affect up to a medium proportion of the population (≤3.12%) which is not enough to affect the population trajectory.

- Disturbance from the activity requiring derogation will not affect the maintenance of a sufficiently large habitat to maintain the populations on a long-term basis, as any effects are temporary and not enough to affect the population trajectory.
- The proposed mitigation measures have been developed in accordance best scientific knowledge and best practice standards. Further, it is confirmed that such measures have been deployed by the Applicant in similar circumstances (i.e. offshore wind projects in the UK that were subject to similar licences) with successful results as demonstrated herein.
- It is the view of the Applicant that compensation is not required given that FCS will not be affected.

5.3.5.2 As a result, the derogation licence with regards to disturbance from the activity requiring derogation will not be detrimental to the maintenance of FCS for the populations of the species in their natural range to which the Habitat Directive relates to (i.e. Annex IV cetacean species). The activity requiring derogation (i.e. piling) will not impact any Annex IV cetacean species to an extent that would result in adverse population-level consequences or prejudice the maintenance of favourable conservation status within their natural range on a long term basis – this includes those with FCS (i.e. Common dolphin, bottlenose dolphin, Risso's dolphin) as well as minke whale and harbour porpoise where the Applicant has concluded that the activity requiring derogation will neither deteriorate the conservation status nor impede the achievement or restoration of FCS. In accordance with EC Guidance (2021) (Section 3.2.3.b), the net result of the derogation is neutral for the species' conservation status.

6 Monitoring the Impacts of the Derogation

6.1 Monitoring Proposals

6.1.1.1 A comprehensive Marine Mammal Mitigation Plan will be implemented throughout the activity requiring derogation (i.e. piling campaign) as outlined in Section 6 of Annex D of this document. This includes measures to monitor the presence of marine mammals and the effectiveness of the proposed mitigation measures before and during the activity requiring derogation (i.e. piling).

6.1.1.2 In accordance with DAHG (2014), this includes the provision of marine mammal monitoring within 1km (MMMZ) prior to piling, the provision of MMOs during daylight hours and PAM during the hours of darkness/poor visibility.

6.2 Reporting Mechanisms

6.2.1.1 The MMO and PAM operator will be responsible for monitoring and recording compliance. This will be shared with the Applicant who will then submit the relevant reports as well as the EU Returns Form to the NPWS in a timely manner.

6.2.1.2 Specifically, Section 6.11 of Annex D of this document, outlines the reporting requirements and states the following in relation to reporting:

"A record of piling operations, MMO/PAM survey effort and sightings will be maintained during piling. These reports include:

- *An outline of the marine mammal monitoring methodology and procedures employed;*
- *A record of all piling operations detailing dates, additional mitigation measures, softstart duration, piling duration, hammer energy during soft-start and full-power, and any operational issues;*

- *A record of survey effort including the duration of the MMO/PAM operator's watch, environmental conditions, a description of any marine mammal sightings, passive acoustic recordings and any actions taken A record of any incidental sightings will also be made during the pre-piling watch or operations;*
- *Details of any problems encountered during the piling process including any instances of non-compliance with the marine licence; and*
- *Any recommendations for amendment of the protocol."*

6.2.1.3 This reporting is in addition to any EU Returns Forms that may be required, subject to the grant of this derogation licence application. This approach will also satisfy the requirements of Section 4 of the NPWS guidance (NPWS, 2026) which requires the following for any post-completion monitoring reports:

- *Clearly specify the mitigation measures that have been applied, using plans and photographs where appropriate.*
- *Show results of surveys of the target species, using methods comparable to those undertaken when establishing the baseline population e.g. camera monitoring of otter activity pre- and post-completion of mitigation measures should be undertaken at similar locations and for similar duration.*
- *Identify any corrective measures that have been undertaken to address unforeseen failure to maintain the species populations at the relevant (e.g. local, national) scale.*

6.2.1.4 As part of the monitoring for any derogation licence that may be granted, it is confirmed that the Applicant will therefore submit the following reports to the NPWS:

- A narrative report which will detail the activities undertaken;
- The MMO report;
- EU Returns Form; and
- Any other report that may be specified by the NPWS in the grant of this derogation licence application.

6.2.1.5 Monitoring outcomes will be reviewed regularly, and corrective measures will be implemented where required, in accordance with NPWS (2026) guidance. The report to be submitted will also discuss the protocols followed, and put forward any recommendations based on project experience, that could benefit future offshore wind farm construction projects. This monitoring framework provides additional confidence that conservation status will be maintained throughout implementation of the activity requiring derogation (i.e. the piling campaign).

7 Conclusion

7.1.1.1 Five Annex IV cetacean species have been identified that may be within the vicinity of the Proposed Development: harbour porpoise, bottlenose dolphin, Risso's dolphin, common dolphin, and minke whale. The Risk Assessment has concluded that there is potential for deliberate disturbance under Regulation 51(2)(b) of the Habitat Regulations from the piling required for foundation installation associated with the Proposed Development.

7.1.1.2 A derogation is therefore sought under Regulation 54 of the Habitat Regulations and this report has been prepared support the derogation licence application submitted to the National Parks and Wildlife Service.

7.1.1.3 The information required to support the application includes the evidence required for each of the three legal tests in Regulation 54 of the Habitat Regulations that apply before a derogation may be granted. The Applicant considers that the derogation is required 'in the interests of public health and public safety, or for other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment', that there are no satisfactory alternatives and that the derogation is not detrimental to the maintenance of the populations of the species to which the Habitats Directive relates at a favourable conservation status in their natural range.

7.1.1.4 As such, the Applicant considers that the evidence herein sufficiently supports the granting of the derogation that is required for the Proposed Development.

8 References

Beatrice Offshore Wind Farm Ltd (2018) Piling Strategy Implementation Report, April 2018. Available from: https://marine.gov.scot/data/beatrice-offshore-windfarm-piling-strategy-implementation-report [Accessed July 2026]

Benhemma-Le Gall, A., Graham, I. Merchant, N.D. and Thompson, P.M. (2022), 'Broad-Scale Responses of Harbor Porpoises to Pile-Driving and Vessel Activities during Offshore Windfarm Construction', Frontiers in Marine Science, 8.

Benhemma-Le Gall, A., Thompson, P., Merchant, N. and Graham, I. (2023), 'Vessel noise prior to pile driving at offshore windfarm sites deters harbour porpoises from potential injury zones', Environmental impact assessment review, 103: 107271.

Benhemma-Le Gall, A., Hastie, G.D., Brown, A.M., Booth, C.G., Graham, I.M., Fernandez-Betelu, O., Iorio-Merlo, V.,Bashford, R., Swanson, H., Cheney, B.J., Abad Oliva, N. & Thompson, P.M. (2024). Harbour porpoise responses to the installation of XXL monopiles without noise abatement; implications for noise management in the Southern North Sea. PrePARED Report, No. 004. August 2024.

Berrow, S.D., Whooley, P., O'Connell, M. and Wall, D. (2010), 'Irish Cetacean Review (2000–2009),' Irish Whale and Dolphin Group, 60.

Boisseau, O., McGarry, T., Stephenson, S., Compton, R., Cucknell, A., Ryan, C., McLanaghan, R & Moscrop. (2021). Minke whales avoid a 15 kHz acoustic deterrent device. Marine Ecology Progress Series. 667(10), p.3354.

Brandt, J. et al, Disturbance of harbour porpoises during construction of the first seven offshore wind farms in Germany, Mar Ecol Prog Ser 596:213-232 (2018)

Brown, A.M., Majewska, K., Benhemma-Le Gall, A., Sinclair, R., Haber, I. & Ogilvy, C. (2025). Evidence review of harbour porpoise disturbance ranges in the context of the assessment and management of impulsive noise in Special Areas of Conservation: impact piling. JNCC Report 799, JNCC, Peterborough, ISSN 0963-8091.

Buckland, S. T., Anderson, D.R., Burnham, K.P., Laake, J.L., Borchers, D. L., & Thomas, L. (2004), 'Advanced Distance Sampling: Estimating abundance of biological populations', Oxford University Press.

Canty, A. and Ripley, B. (2021), 'Bootstrap Function, 2025-08-29'.

Centre for Marine and Coastal Studies (CMACS) (2003), 'A Baseline Assessment of Electromagnetic fields Generated by Offshore Windfarm Cables', Report No. COWRIE EMF-01-2002, 66. (Birkenhead, UK: Centre for Marine and Coastal Studies).

Copping, A. (2018), 'The State of Knowledge for Environmental Effects Driving Consenting/Permitting for the Marine Renewable Energy Industry', Prepared for Ocean Energy Systems On behalf of the Annex IV Member Nations.

Culloch, R. M., Anderwald, P., Brandecker, A., Haberlin, D., McGovern, B., Pinfield, R., Visser, F., Jessopp, M. and Cronin, M. (2016), 'Effect of construction-related activities and vessel traffic on marine mammals', Marine Ecology Progress Series, 549: 231-242

DAHG (Department of Arts, Heritage, and the Gaeltacht). (2014), 'Guidance to manage the risk to marine mammals from man-made sound sources in Irish Waters'.

Diederichs, A., Nehls, G. and Brandt, M. J. (2010), 'Does sand extraction near Sylt affect harbour porpoises?', Wadden Sea Ecosystem No. 26 edition, Common Wadden Sea Secretariat, Wilhelmshaven, Germany.

Efron, B. and Tibshirani, R.J. (1993), 'An introduction to the bootstrap', Chapman & Hall, London.

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

European Commission (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC: Clarification of the concepts of alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission. Luxembourg: Office for Official Publications of the European Communities. Available from: https://kliimaministeerium.ee/sites/default/files/documents/2021-07/Juhenddokument%20loodusdirektiivi%2092_43_EM%C3%9C%20artikli%206%20l%C3%B5ike%204%20kohta%20%28puudutab%20Natura%20hindamise%20tulemusena%20erandite%20tegemist%29%20inglise%20keeles.pdf [Accessed: February 2026].

European Commission (2007b). Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC – Final version, February 2007, European Commission, 2007. Available at: https://op.europa.eu/en/publication-detail/-/publication/1059d053-7082-421a-9bdc-54b2749c16c7/language-en [Accessed: March 2026].

European Commission (2021). The strict protection of animal species of Community interest under the Habitats Directive – Guidance document - A summary. Publications Office of the European Union, 2021. Available at: https://data.europa.eu/doi/10.2779/3123 [Accessed: March 2026].

Fernandez-Betelu, O., Graham, I. M., Brookes, K. L., Cheney, B. J., Barton, T. R. and Thompson, P. M. (2021), 'Far-Field Effects of Impulsive Noise on Coastal Bottlenose Dolphins', Frontiers in Marine Science, 8.

Gilles, A, Authier, M, Ramirez-Martinez, NC, Araújo, H, Blanchard, A, Carlström, J, Eira, C, Dorémus, G, Fernández-Maldonado, C, Geelhoed, SCV, Kyhn, L, Laran, S, Nachtsheim, D, Panigada, S, Pigeault, R, Sequeira, M, Sveegaard, S, Taylor, NL, Owen, K, Saavedra, C, Vázquez-Bonales, JA, Unger, B, Hammond, PS (2023). 'Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys', Final report published 29 September 2023. 64 pp. https://www.tiho-hannover.de/itaw/scans-iv-survey

Graham, I.M., Gillespie, D., Gkikopoulou, K.C., Hastie, G.D., Thompson, P.M. (2023). Directional hydrophone clusters reveal evasive responses of small cetaceans to disturbance during construction at offshore windfarms. Biology Letters, 19, p.20220101.

Graham, I. M., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Bono, S. and Thompson, P. M. (2019), 'Harbour porpoise responses to pile-driving diminish over time', Royal Society Open Science, 6/6: 190335.

Graham, I. M., Pirotta, E., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Hastie, G. D. and Thompson, P. M. (2017), 'Responses of bottlenose dolphins and harbor porpoises to impact and vibration piling noise during harbor construction', Ecosphere, 8/5.

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

Helm, R. C., Costa, D. P., DeBruyn, T. D., O'Shea, T. J., Wellws, R. S. and Williams, T. M. (2015), 'Overview of Effects of Oil Spills on Marine Mammals', in M. Fingas (eds.), Handbook of Oil Spill Science and Technology, First Edition (John Wiley and Sons, Inc).

Hermannsen, L., Tougaard, J., Beedholm, K., Nabe-Nielsen, J. and Madsen, P. T. (2015), 'Characteristics and propagation of airgun pulses in shallow water with implications for effects on small marine mammals', PloS one, 10/7: p.e0133436.

Hinzmann, N., Stein, P., Gattermann, J., Bachmann, J., and Duff, G. (2017), 'Measurements of hydro sound emissions during internal jet cutting during monopile decommissioning', Conference Proceedings for COME 2017 – Decommissioning of Offshore Geotechnical Structures. https://www.researchgate.net/publication/322986958_Measurements_of_hydro_sound_emissions_during_internal_jet_cut-ting_during_monopile_decommissioning [Accessed March 2026].

IAMMWG (Inter-Agency Marine Mammal Working Group). (2023), 'Review of Management Unit boundaries for cetaceans in UK waters', JNCC Report No. 734, JNCC Peterborough. ISSN 0963-8091.

IWDG. (2025), 'Sightings'. https://iwdg.ie/browsers/sightings.php. [Accessed: February 2026].

JNCC, Department of Agriculture, Environment and Rural Affairs, Natural England, Natural Resources Wales & NatureScot. (2026a). Conservation status assessment for the species: S1350 Common dolphin (*Delphinus delphis*). Available online: https://data.jncc.gov.uk/data/15a481c0-ac7a-4762-af58-d81566781677/habs-regs-reporting-2019-2024-s1350-common-dolphin-assessment.pdf [Accessed March 2026].

JNCC, Department of Agriculture, Environment and Rural Affairs, Natural England, Natural Resources Wales & NatureScot. (2026b). Conservation status assessment for the species: S1349 Bottlenose dolphin (*Tursiops truncatus*). Available online: https://data.jncc.gov.uk/data/15a481c0-ac7a-4762-af58-d81566781677/habs-regs-reporting-2019-2024-s1349-bottlenose-dolphin-assessment.pdf [Accessed March 2026].

JNCC, Department of Agriculture, Environment and Rural Affairs, Natural England, Natural Resources Wales & NatureScot. (2026c). Conservation status assessment for the species: S2030 Risso's dolphin (*Grampus griseus*). Available online: https://data.jncc.gov.uk/data/15a481c0-ac7a-4762-af58-d81566781677/habs-regs-reporting-2019-2024-s2030-rissos-dolphin-assessment.pdf [Accessed March 2026].

JNCC, Department of Agriculture, Environment and Rural Affairs, Natural England, Natural Resources Wales & NatureScot. (2026d). Conservation status assessment for the species: S1351 Harbour porpoise (*Phocoena phocoena*). Available online: https://data.jncc.gov.uk/data/15a481c0-ac7a-4762-af58-d81566781677/habs-regs-reporting-2019-2024-s1351-harbour-porpoise-assessment.pdf [Accessed March 2026].

JNCC, Department of Agriculture, Environment and Rural Affairs, Natural England, Natural Resources Wales & NatureScot. (2026e). Conservation status assessment for the species: S2618 Minke whale (*Balaenoptera acutorostrata*). Available online: https://data.jncc.gov.uk/data/15a481c0-ac7a-4762-af58-d81566781677/habs-regs-reporting-2019-2024-s2618-minke-whale-assessment.pdf [Accessed March 2026].

Joint Nature Conservation Committee (JNCC), (2025a), 'JNCC guidelines for minimising the risk of injury to marine mammals from explosive use in the marine environment', JNCC, Aberdeen.

Joint Nature Conservation Committee (JNCC), (2025b). Updated Effective Deterrent Ranges (EDRs) for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise Special Areas of Conservation (SACs) (England, Wales & Northern Ireland). JNCC Report 803. JNCC, Peterborough, ISSN 0963-8091.

JNCC. (2023). JNCC guidance for the use of Passive Acoustic Monitoring in UK waters for minimising the risk of injury to marine mammals from offshore activities. JNCC, Peterborough.

Joint Nature Conservation Committee (JNCC), (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). JNCC Report No. 654, JNCC, Peterborough, ISSN 0963-8091.

Kastelein, R. A., Jennings, N., Verboom, W. C., De Haan, D. and Schooneman, N. M. (2006), 'Differences in the response of a striped dolphin (*Stenella coeruleoalba*) and a harbour porpoise (*Phocoena phocoena*) to an acoustic alarm', Marine Environmental Research, 61/3: 363-378.

Kirschvink, J. L., Dizon, A. E. and Westphal, J. A. (1986), 'Evidence from strandings for geomagnetic sensitivity in cetaceans, Journal of Experimental Biology', 120/1: 1-24.

Laist, D.W., Knowlton, A.R., Mead, J.G., Collet, A.S. and Podesta, M. (2001), 'Collisions between ships and whales', Marine Mammal Science, 17: 35-75.

Lusseau, D. (2003), 'Male and female bottlenose dolphins *Tursiops spp.* have different strategies to avoid interactions with tour boats in Doubtful Sound', New Zealand. Marine Ecology Progress Series, 257: 267-274.

Lusseau, D. (2006), 'The short-term behavioral reactions of bottlenose dolphins to interactions with boats in Doubtful Sound, New Zealand', Marine Mammal Science, 22: 802-818.

Marley, S., Kent, C. S. and Erbe, C. (2017), 'Occupancy of bottlenose dolphins (*Tursiops aduncus*) in relation to vessel traffic, dredging, and environmental variables within a highly urbanised estuary', Hydrobiologia, 792: 243-263.

Matei M., Klementisová K., Chudzinska M., Marwood E.M., Haber I., Gregory E., Simmons S. and Brown A. (2026). Harbour porpoise responses to unabated impact piling of monopile foundations at the Dogger Bank C offshore wind farm. Report to Dogger Bank Wind Farm Limited. Report number: SMRUC-DBC-2025-029.

McGarry, T., De Silva, R., Canning, S., Mendes, S., Prior, A., Stephenson, S. & Wilson, J. (2022). Evidence base for application of Acoustic Deterrent Devices (ADDs) as marine mammal mitigation (Version 4.0). JNCC Report No. 615, JNCC, Peterborough. ISSN 0963-8091.

McGarry, T., Boisseau, O., Stephenson, S., and Compton, R. (2017). Understanding the Effectiveness of Acoustic Deterrent Devices on Minke Whale (Balaenoptera acutorostrata), a low frequency cetacean. ORJIP Project 4, Phase 2. RPS Report EOR0692. Prepared onbehalf of The Carbon Trust. November 2017.

McQueen, A. D., Suedek, B. C., de Jong, C., Thomsen, F. (2020), 'Ecological Risk Assessment of underwater sound from dredging operations', Integrated Environmental Assessment and Management, 16: 481-493

NBDC (National Biodiversity Data Centre). (2023),' 'Biodiversity Maps: online mapping tool, National Biodiversity Data Centre, Ireland', Available from: https://maps.biodiversityireland.ie/Map. [Accessed April 2024].

Normandeau Associates Inc, Exponent Inc, Tricas, T. and Gill, A. (2011), 'Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species', (Camarillo, CA: U.S. Department of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement).

Nowacek, S.M., Wells, R.S. and Solow, A.R. (2001), 'Short-term effects of boat traffic on bottlenose dolphins, *Tursiops truncatus*, in Sarasota Bay, Florida', Marine Mammal Science, 17/4: 673-688

NPWS (National Parks and Wildlife Services). (2026), Applications for Regulation 54 Derogations for Annex IV species: Guidance for Applicants. v2 – June 2026.

NPWS (National Parks and Wildlife Service) (2025a) Application for Derogation Under Regulation 54 & 54A of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Revision 2.0 – July 2025

NPWS (National Parks and Wildlife Service). (2025b), 'The status of EU protected habitats and species in Ireland, Volume 1: Summary Overview', Unpublished NPWS report.

NPWS (National Parks and Wildlife Services). (2021), 'Guidance on the strict protection of certain animal and plant species under the Habitats Directive in Ireland', National Parks and Wildlife Service Guidance Series No. 1. Department of Housing, Local Government and Heritage.

Phillips, B., Roberts, A., Buckland, L., Canning, S., Goudling, A., Mendes, S., Prior, A., De Silva, R., Stephenson, S., and McGarry, T. (2025), 'Evidence base for application of Acoustic Deterrent Devices (ADDs) as marine mammal mitigation', JNCC Report 615.

Pirotta, E., Laesser, B.E., Hardaker, A., Riddoch, N., Marcoux, M. and Lusseau, D. (2013), 'Dredging displaces bottlenose dolphins from an urbanised foraging patch'. Marine Pollution Bulletin, 74: 396- 402.

R Development Core Team (2025), 'A Language and Environment for Statistical Computing', R Foundation for Statistical Computing, Vienna.

Rogan, E., Breen, P., Mackey, M., Cañadas, A., Scheidat, M., Geelhoed, S. and Jessopp, M. (2018), 'Aerial surveys of cetaceans and seabirds in Irish waters: Occurrence, distribution and abundance in 2015-2017', Department of Communications, Climate Action and Environment and National Parks and Wildlife Service (NPWS), 297pp.

Schoeman, R. P., Patterson-Abrolat, C. and Plön, S. (2020), 'A global review of vessel collisions with marine animals', Frontiers in Marine Science, 7.

Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene, C. R. J., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., Tyack, P. L. (2007), 'Marine mammal noise exposure criteria: initial scientific recommendations', Aquatic Mammals 33: 411-414.

Southall, B., Finneran, J., Reichmuth, C., Nachtigall, P., Ketten, D., Bowles, A., Ellison, W., Nowacek, D. and Tyack, P. (2019), 'Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammal', 45/2:125-232.

Stone, C., Hall, K., Mendes, S. and Tasker, M. (2017), 'The Effects of Seismic Operations in UK Waters: Analysis of Marine Mammal Observer Data', Journal of Cetacean Research and Management, 16/2017: 71–85.

Thomas, L., Buckland, S. T., Rexstad, E. A., Laake, J. L., Strindberg, S., Hedley, S. L., Bishop, J. R., Marques, T. A., and Burnham, K. P. (2010), 'Distance software: design and analysis of distance sampling surveys for estimating population size', The Journal of applied ecology, 47(1), 5–14.

Todd, V.L., Todd, I.B., Gardiner, J.C., Morrin, E.C., MacPherson, N.A., DiMarzio, N.A. and Thomsen, F. (2015), 'A review of impacts of marine dredging activities on marine mammals', ICES Journal of Marine Science, 72/2: 328-340.

Verboom, W. (2014). 'Preliminary information on dredging and harbour porpoises', Juno Bioacoustics

Annexes to this Report

The Annexes included as part of this Supporting Report are as outlined below.

Annex to this application	Document name	Planning application reference	Weblink
Annex A	EIAR Volume II – Chapter 4: Description of Development (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_04_description_of_development_revised_march_2026.pdf
Annex B	Proposed activities screened into the Annex IV Risk Assessment	n/a – prepared to support this report	
Annex C	EIAR Volume III - Appendix 25.1: Environmental Management Plan (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_25_1_environmental_management_plan_revised_march_2026.pdf
Annex D	EIAR Volume III - Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_25_2_marine_mammal_mitigation_plan_revised_march_2026.pdf
Annex E	EIAR Volume II - Chapter 11: Marine Mammals (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_11_marine_mammals_revised_march_2026.pdf
Annex F	NIS Volume II – Stage 2 AA; Natura Impact Statement (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, NIS.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-ii/abwp2_natura_impact_statement_revised_march_2026.pdf
Annex G	Baseline Characterisation of Annex IV species.	n/a – prepared to support this report	
Annex H	EIAR Volume III - Appendix 11.2: Marine Mammals Technical Report (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-iii/abwp2_11_2_marine_mammals_technical_report_revised_march_2026.pdf
Annex I	EIAR Volume III - Appendix 25.7: Vessel Management Plan	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-25.7-vessel-management-plan.pdf

Annex J	EIAR Volume III - Appendix 25.10: Environmental Vessel Management Plan	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-25.10-environmental-vessel-management-plan.pdf
Annex K	EIAR Volume III – Appendix 11.1: Underwater Noise Assessment (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/nis-vol-iii/abwp2_11_1_underwater_noise_assessment_revised_march_2026.pdf
Annex L	EIAR Volume III - Appendix 11.3: Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix	https://www.arklowbank2offshoreplanning.ie/downloads/eiar/abwp2-appendix-11.3-phase-1-offshore-wind-farms-cumulative-ipcod-modelling.pdf
Annex M	EIAR Volume II - Chapter 2: Policy and Legislation (Revised March 2026).	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_02_policy_and_legislation_revised_march_2026.pdf
Annex N	EIAR Volume II - Chapter 3: Consideration of Alternatives (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Chapter.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-ii/abwp2_03_consideration_of_alternatives_revised_march_2026.pdf
Annex O	Noise Mitigation Systems and Strategies – A Targeted Literature Review.	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, RFI Response Annex 5	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/applicant-response-to-the-request-for-further-information/abwp2_applicant_response_to_further_information_rfi_march_2026.pdf
Annex P	EIAR Volume III - Appendix 15.2: Safety Justification (Revised March 2026)	Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Appendix.	https://www.arklowbank2offshoreplanning.ie/downloads/rfi/eiar-vol-iii/abwp2_15_2_shipping_and_navigation_safety_justification_rfi_march_2026.pdf
Annex Q	Dogger Bank C: Marine Mammal Compliance Report (Turbines)	n/a – Prepared for Dogger Bank C	
Annex R	Dogger Bank C: Marine Mammal Compliance Report (Offshore Substation Platform	n/a – Prepared for Dogger Bank C	
Annex S	Underwater Noise Assessment Approach	n/a – prepared to support this report	

Annex A Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume II - Chapter 4: Description of Development (Revised March 2026)

Annex B Proposed activities screened into the Annex IV Risk Assessment

Annex C Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III – Appendix 25.1: Environmental Management Plan (Revised March 2026)

Annex D Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 25.2: Marine Mammal Mitigation Plan (Revised March 2026)

Annex E Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume II - Chapter 11: Marine Mammals (Revised March 2026)

Annex F Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, NIS Volume II – Stage 2 AA; Natura Impact Statement (Revised March 2026)

Annex G Baseline Characterisation of Annex IV species

Annex H Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 11.2: Marine Mammals Technical Report (Revised March 2026)

Annex I Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 25.7: Vessel Management Plan

Annex J Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 25.10: Environmental Vessel Management Plan

Annex K Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III – Appendix 11.1: Underwater Noise Assessment (Revised March 2026)

Annex L Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 11.3: Phase 1 Irish Offshore Windfarms: Cumulative iPCoD Modelling

Annex M Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume II - Chapter 2: Policy and Legislation (Revised March 2026)

Annex N Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume II - Chapter 3: Consideration of Alternatives (Revised March 2026)

Annex O Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, RFI Response Annex 5: Noise Mitigation Systems and Strategies – A Targeted Literature Review.

Annex P Application for Planning Permission for the Proposed Development ACP Case Ref. ABP-319864-24, EIAR Volume III - Appendix 15.2: Shipping and Navigation Safety Justification (Revised March 2026)

Annex Q Dogger Bank C: Marine Mammal Compliance Report (Turbines)

Annex R Dogger Bank C: Marine Mammal Compliance Report (Offshore Substation Platform

Annex S Underwater Noise Assessment Approach