codling wind park

Environmental Impact Assessment Report

Volume 3

Chapter 16 Shipping and Navigation


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Abbreviations

Abbreviation	Term in Full
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
CWP	Codling Wind Park
DCCAE	Department of Communications, Climate Action and Environment
DLRCC	Dún Laoghaire-Rathdown County Council
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
EMF	Electromagnetic Interference
EU	European Union
FSA	Formal Safety Assessment
GPS	Global Positioning System
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	International Maritime Organization
ITF	International Transport Forum
km	Kilometres
MCA	Maritime and Coastguard Agency
MCIB	Marine Casualty Investigation Board
MGN	Marine Guidance Note
MSO	Marine Survey Office
NIS	Natura Impact Statement
nm	Nautical Mile
NRA	Navigational Risk Assessment
OECC	Offshore Export Cable Corridor
OECD	Organisation for Economic Cooperation and Development
OREI	Offshore Renewable Energy Installation
OSS	Offshore Substation Structure
PLL	Potential Loss of Life
Radar	Radio Detection and Ranging
RNLI	Royal National Lifeboat Institution

Abbreviation	Term in Full
RYA	Royal Yachting Association
SAR	Search and Rescue
SOLAS	International Convention for the Safety of Life at Sea
TSS	Traffic Separation Scheme
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
VHF	Very High Frequency
WTG	Wind Turbine Generator

Definitions

Glossary	Meaning
allision	The act of striking or collision of a moving vessel against a stationary object.
the Applicant	The developer, Codling Wind Park Limited (CWPL).
array site	The red line boundary area within which the wind turbine generators (WTGs), inter-array cables (IACs) and the Offshore Substation Structures (OSSs) are proposed.
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status (e.g., under power). Most commercial vessels and United Kingdom (UK) / European Union (EU) fishing vessels over 15 m in length are required to carry AIS.
Codling Wind Park (CWP) Project	The proposed development as a whole is referred to as the Codling Wind Park (CWP) Project, comprising of the offshore infrastructure, the onshore infrastructure and any associated temporary works.
Codling Wind Park Limited (CWPL)	A joint venture between Fred. Olsen Seawind (FOS) and Électricité de France (EDF) Renewables, established to develop the CWP Project.
collision	The act or process of colliding (contact) between two moving objects.
Environmental Impact Assessment (EIA)	A systematic means of assessing the likely significant effects of a proposed project, undertaken in accordance with the EIA Directive and the relevant Irish legislation.
Environmental Impact Assessment Report (EIAR)	The report prepared by the Applicant to describe the findings of the EIA for the CWP Project.
export cables	The cables, both onshore and offshore, that connect the offshore substations with the onshore substation.
export cable study area	A 2 nautical mile (nm) buffer of the offshore export cable corridor.
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
inter-array cables (IACs)	The subsea electricity cables between each WTG between and the OSSs.
interconnector cables	The subsea electricity cables between OSSs.
landfall	The point at which the offshore export cables are brought onshore and connected to the onshore export cables via the transition joint bays (TJB). For the CWP Project, the landfall works include the installation of the offshore export cables within Dublin Bay out to approximately 4 km offshore, where water depths are too shallow for conventional cable lay vessels to operate.
limit of deviation (LoD)	Locational flexibility of permanent and temporary infrastructure is described as a LoD from a specific point or alignment.

Glossary	Meaning
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA), which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Navigational Risk Assessment (NRA)	A document which assesses the hazards to shipping and navigation of a proposed Offshore Renewable Energy Installation (OREI) based upon the FSA.
offshore export cables	The cables which transport electricity generated by the WTGs from the offshore substations (OSSs) to the TJBs at the landfall.
offshore export cable corridor (OECC)	The area between the array site and the landfall, within which the offshore export cables will be installed, along with cable protection and other temporary works for construction.
Offshore Renewable Energy Installation (OREI)	As defined by Marine Guidance Note 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (Maritime and Coastguard Agency (MCA), 2021). For the purposes of this report and in keeping with the consistency of the Environmental Impact Assessment (EIA), OREI can mean offshore wind turbines and the associated electrical infrastructure including offshore substations.
offshore substation structure (OSS)	A fixed structure located within the array site, containing electrical equipment to aggregate the power from the wind turbine generators and convert it into a more suitable form for export to shore.
Radio Detection and Ranging (Radar)	An object detection system which uses radio waves to determine the range, altitude, direction or speed of objects.
regular operator	Commercial operator whose vessel(s) are observed to transit through a particular region on a regular basis.
study area	A 10 nm buffer of the array site boundary.
Traffic Separation Scheme (TSS)	A traffic management route system ruled by the International Maritime Organization (IMO). The traffic lanes (or clearways) indicate the general direction of the vessels in that zone; vessels navigating within a TSS all sail in the same direction, or they cross the lane in an angle as close to 90 degrees (°) as possible.
unique vessel	An individual vessel identified on any particular calendar day, irrespective of how many tracks were recorded for that vessel on that day. This prevents vessels being over counted. Individual vessels are identified using their Maritime Mobile Service Identity (MMSI).

16 SHIPPING AND NAVIGATION

16.1 Introduction

1. Codling Wind Park Limited (hereafter 'the Applicant') is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish sea approximately 13–22 kilometres (km) off the east coast of Ireland, at County Wicklow.

2. This chapter forms part of the Environmental Impact Assessment Report (EIAR) for the CWP Project. The purpose of the EIAR is to provide the decision-maker, stakeholders and all interested parties with the environmental information required to develop an informed view of any likely significant effects resulting from the CWP Project, as required by the European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) (the EIA Directive).

3. This EIAR chapter describes the potential impacts of the CWP Project's offshore infrastructure on shipping and navigation during the construction, operation and maintenance and decommissioning phases.

4. In summary, this EIAR chapter:

   - Details the EIA scoping and consultation process undertaken and sets out the scope of the impact assessment for shipping and navigation;
   - Identifies the key legislation and guidance relevant to shipping and navigation, with reference to the latest updates in guidance and approaches;
   - Confirms the study area for the assessment and presents the impact assessment methodology for shipping and navigation;
   - Describes and characterises the baseline environment for shipping and navigation, established from desk studies, project survey data and consultation;
   - Defines the project design parameters for the impact assessment and describes any embedded mitigation measures relevant to the shipping and navigation assessment;
   - Presents the assessment of potential impacts on shipping and navigation and identifies any assumptions and limitations encountered in compiling the impact assessment; and
   - Details any additional mitigation and / or monitoring necessary to prevent, minimise, reduce or offset potentially significant effects identified in the impact assessment.

5. In terms of overlap with other assessment topics, this chapter assesses navigational safety impacts to shipping and navigation, including to fishing vessels in transit. In particular, navigational safety impacts to commercial fishing vessels in transit have been assessed within this chapter, with other impacts of relevance to commercial fishing vessels including commercial impacts being assessed within **Chapter 12 Commercial Fisheries**.

6. The assessment should also be read in conjunction with **Appendix 16.1 Cumulative Effects Assessment**, which considers other plans, projects and activities that may act cumulatively with the CWP Project and provides an assessment of the potential cumulative impacts on shipping and navigation.

7. A summary of the CEA for shipping and navigation is presented in **Section 16.11**.

8. As required under the Department of Communications, Climate Action and Environment (DCCAE) Guidance on Environmental Impact Statement (EIS) and Natura Impact Statement (NIS) Preparation for Offshore Renewable Energy Projects (DCCAE, 2017), the shipping and navigation assessment has been informed by a Navigational Risk Assessment (NRA) which is provided at **Appendix 16.3 Navigational Risk Assessment**. Based on stakeholder input received during consultation (see

Section 16.2), the NRA and associated processes have followed the principles set out within the Maritime and Coastguard Agency (MCA) Marine Guidance Note (MGN) 654 (MCA, 2021).

16.2 Consultation

9. Consultation with statutory and non-statutory organisations is a key part of the EIA process. Consultation with regard to shipping and navigation has been undertaken to inform the approach to and scope of the assessment.

10. The key elements to date have included EIA scoping, consultation events, ongoing topic specific meetings with key stakeholders, the regular operators' outreach (i.e., an email outreach to vessel operators who use the local area) and the Hazard Workshop (a key component of the NRA process whereby shipping and navigation impacts are discussed with stakeholders in a group setting). The feedback received throughout this process has been considered in preparing the EIAR. EIA consultation is described further in **Chapter 5 EIA Methodology**, the **Planning Documents** and in the **Public and Stakeholder Consultation Report**, which has been submitted as part of the development consent application.

11. **Table 16-1** provides a summary of the key issues raised during the consultation process relevant to shipping and navigation and details how these issues have been considered in the production of this EIAR chapter.

Table 16-1 Consultation responses relevant to shipping and navigation

Consultee	Comment	How issues have been addressed
Scoping responses		
Irish Lights 1 July 2021	Data sources considered for shipping and navigation at EIAR stage should include Radio Detection and Ranging (Radar) and visual observation data.	The project has undertaken three vessel traffic surveys which included the recording of Radar and visual observation data (see **Section 16.4**).
	Routeing and navigational features assessments should consider the Dublin Bay, Skerries, Tuskar and Smalls Traffic Separation Schemes (TSSs).	The referenced TSS have been captured within the baseline assessment (see **Section 16.6**).
	NRA and EIAR should consider commercial vessels passing between the India and Codling Banks and intersecting the array site.	The referenced vessels have been captured in the data sources considered (**Section 16.4**) and assessed in full within the NRA. Associated impacts are assessed in **Section 16.10**.
	Assessment of anchoring activity from vessels not broadcasting on Automatic Identification System (AIS) would be useful to include in the NRA.	No clear cases of non-AIS anchoring were identified in the vessel traffic survey data, noting the surveys are not comprehensive for sections of the export cable corridor outside of the study area (**Section 16.4.1**). Potential

Consultee	Comment	How issues have been addressed
		for non-AIS anchoring has been discussed with stakeholders.
	Consideration should be given to shared export cable infrastructure with other developments to minimise navigation disruption / risk.	There are no current plans to implement shared transmission infrastructure, noting that the CWP Project will be implementing minimum depth of cover and cable protection as per **Section 16.9**.
	Queried where commercial shipping impacts will be considered in the EIAR.	The NRA has considered navigational safety impacts. However, as per **Section 16.10**, any deviations to vessels are minimal, and therefore by extension no notable commercial impacts are anticipated.
	Noted safety of navigation concerns in relation to deviated commercial vessel routeing should be assessed for the project in isolation and also on a cumulative basis.	Deviations are quantitatively assessed on both in isolation and cumulative basis in the NRA. Associated impacts are assessed in **Section 16.10**.
	Potential impacts on safe navigable depths within the project area due to potential sediment displacement should be considered.	Sediment deposition is considered in **Chapter 6 Marine Geology, Sediments and Coastal Processes**.
	Potential impacts on safety of navigation with presence of wind farm in area of high tidal currents, i.e., whether vessels not under command could be set into danger by the tidal stream should be considered.	Quantitative assessment of drifting risk has been undertaken in the NRA. Associated impacts are assessed in **Section 16.10**.
	Confirmed content with use of MGN 543 as primary guidance for NRA and shipping and navigation assessment purposes.	MGN 654 (most up to date equivalent guidance which superseded MGN 543 in 2021) has been applied as per **Section 16.3**.
	Cumulative impacts should be assessed. In particular, altered routeing cumulatively and potential impact on safety of navigation if all Dublin traffic either diverts north of Kish with a dog-leg into / from Irish Sea, or else goes inshore of banks and between Wicklow Head and CWP in / out of Irish Sea.	Deviations are assessed on both an in isolation and cumulative basis in the NRA. This includes discussion of the referenced scenarios. Associated impacts are assessed in **Section 16.10**.

Consultee	Comment	How issues have been addressed
Topic specific meetings		
Marine Survey Office (MSO) 15 March 2021	MSO confirmed that they are content with MGN 543 being the guidance for the project in the absence of specific Irish guidance. The risk assessment will be undertaken using the principles of the International Maritime Organization (IMO) Formal Safety Assessment (FSA) process.	MGN 654 (most up to date equivalent guidance which superseded MGN 543 in 2021) and the FSA have been applied as per **Section 16.3 and 16.4**.
	The MSO agreed with the use of 'advisory safe passing distances' instead of safety zones (as a statutory instrument would be required for the latter).	Advisory safe passing distances have been assumed as mitigation as per **Section 16.9**.
	Anatec stated that Search and Rescue (SAR) consultation would be undertaken with the Irish Coastguard (IRCG), Royal National Lifeboat Institution (RNLI) and fishing and recreational outreach.	RNLI and IRCG have been consulted (February / March 2023). Recreational representation present at the hazard workshop.
	Suggested any cruise liner operators be included in the regular operators' outreach.	Summary of the regular operators' outreach is provided in the NRA and in this table.
	The MSO had no specific concerns about inshore routeing and would expect the majority of vessels to route outside of the proposed projects (the MSO would not want to encourage inshore routeing).	Deviations are quantitatively assessed on both in isolation and a cumulative basis in the NRA. Associated impacts are assessed in **Section 16.10**.
	Anatec confirmed that anchoring and inshore routeing would be considered in the NRA and EIAR.	Vessel routeing and anchoring have been considered in the NRA. Associated impacts are assessed in **Section 16.10**.
Meeting with Irish Lights 25 March 2021	Irish Lights confirmed content with the use of MGN 543 and FSA.	MGN 654 (most up to date equivalent guidance which superseded MGN 543 in 2021) and the FSA have been applied as per **Section 16.3 and 16.4**.
	Noted renewable projects, oil and gas and any port developments should be	Cumulative development screening has been undertaken in the NRA, with further assessment in Chapter 16,

Consultee	Comment	How issues have been addressed
	considered where appropriate for the cumulative assessment.	**Appendix 16.1 Cumulative Effects Assessment**.
	Noted that cumulative effects on routeing should be considered within the NRA.	Deviations are quantitatively assessed on both in isolation and cumulative basis in the NRA. Associated impacts are assessed in **Section 16.10**.
	Noted that risks associated with drifting vessels should be considered within the NRA.	Quantitative assessment of drifting risk has been undertaken in the NRA. Associated impacts are assessed in **Section 16.10**.
	Noted that effects in relation to under keel clearance would be considered within the NRA and the EIAR.	The NRA has assessed baseline vessel draughts, with impacts associated with under keel clearance assessed within **Section 16.10**.
Meeting with Dublin Port 16 June 2021	Dublin Port confirmed content with the use of MGN 654 and FSA.	MGN 654 (most up to date equivalent guidance which superseded MGN 543 in 2021) and the FSA have been applied as per **Section 16.3 and 16.4**.
	Anatec confirmed that the cumulative assessment will assess all projects on a tiered approach based on information available.	Cumulative development screening has been undertaken in the NRA, with further assessment in Chapter 16, **Appendix 16.1 Cumulative Effects Assessment**.
	Anatec confirmed that regular operators, local fisheries and yacht clubs would be contacted for feedback.	Recreational representation present at the hazard workshop, and a regular operators' outreach has been undertaken.
Meeting with Irish Lights 15 February 2023	Confirmed content with vessel traffic survey data approach.	Data sources as per those agreed (see **Section 16.4**).
Meeting with MSO 27 February 2023	Confirmed content with vessel traffic survey data approach.	Data sources as per those agreed (see **Section 16.4**).
Meeting with RNLI 28 February 2023	Confirmed content with vessel traffic survey data approach.	Data sources as per those agreed (see **Section 16.4**).
Meeting with IRCG 7 March 2023	Confirmed content with vessel traffic survey data approach.	Data sources as per those agreed (see **Section 16.4**).
Meeting with Dún Laoghaire Harbour 18 July 2023	Discussion of OECC relative to the harbour entrance and approach.	Port access is assessed in **Section 16.10**.
Meeting with Irish Lights 23 October 2023	Discussed approach to lighting and marking to be implemented for the CWP Project.	A **Lighting and Marking Plan** has been included with the Application to present proposed plans for lighting and marking.

Consultee	Comment	How issues have been addressed
Meeting with IRCG 4 November 2023	Discussions on SAR Access were held with IRCG.	Impacts on SAR are assessed in **Section 16.10**.
Other		
CLdN 7 November 2022 Regular Operators Outreach	'The project would currently not interfere with our routes, maybe only potentially during the construction there might be some limitations'.	Associated impacts assessed in **Section 16.10**.
	Noted aviation lights have potential to cause confusion / distraction to mariners.	Final lighting and marking will be agreed with key stakeholders, including Irish Lights and the Irish Aviation Authority (see **Section 16.9**).
	Noted potential for marine radar interference.	Impacts to marine radar have been fully assessed in the NRA.
Irish Ferries 10 December 2022 Regular Operators Outreach	Project will not impact existing routes; however the NRA should assess: '• *Displacement of other vessel traffic from the area of the Park to the area of our routes;* • *Reduced sea room for collision avoidance with such displaced traffic.'*	The NRA has considered displacement and collision risk, with associated impacts assessed in **Section 16.10**.
	Irish Ferries vessels would not transit through the array site.	Considered in impact assessment in **Section 16.10**.
Hazard Workshop (see NRA for full details of attendees) 17 January 2023	Suggested key local port authorities (Dublin Port, Dún Laoghaire Harbour) should be included in cable burial process.	Outcomes of the process will be provided to relevant stakeholders for information noting input from ports has been considered.
	Queried any use of exclusion / safety zones that would be enforced around the cable lay vessels during operations.	It is intended that advisory safe passing distances will be utilised as per **Section 16.10**.
	Noted that COVID may have impacted the 2021 vessel traffic survey datasets, and that vessel numbers to Dún Laoghaire Harbour and Dublin Port may increase.	Multiple data sources have been considered, including post 2021 traffic survey (see **Section 16.4**). The NRA modelling has included multiple future case traffic growth scenarios.
	Noted that non-AIS recreational activity should be considered.	Multiple data sources have been considered, including non-AIS data collected during

Consultee	Comment	How issues have been addressed
		vessel traffic surveys (see **Section 16.4**).
	General consensus was that the overarching cumulative picture, in particular inshore of the banks, was a key concern. Agreed that effective promulgation of information would be a key mitigation, and that use of guard vessels where appropriate should also be considered.	Cumulative impacts have been assessed in Chapter 16, **Appendix 16.1 Cumulative Effects Assessment**. Promulgation of information and use of guard vessels where appropriate have been assumed as mitigation as per **Section 16.9**.
	Noted that vessels in Dublin Bay may need to emergency anchor over or near to laid subsea cables.	Associated impacts assessed in **Section 16.10**.
	Dublin Port and Dún Laoghaire Harbour stated water depths should not be reduced in the harbour approaches.	Associated impacts assessed in **Section 16.10**.

16.3 Legislation, policy and guidance

16.3.1 Legislation

12. The legislation that is applicable to the assessment of shipping and navigation is summarised below. Further detail is provided in **Chapter 2 Policy and Legislative Context**.

- United Nations Convention on the Law of the Sea (United Nations, 1982);
- Convention on the International Regulations for Preventing Collisions at Sea (International Maritime Organization (IMO), 1972/77); and
- Safety of Life at Sea Chapter V (IMO, 1974).

16.3.2 Policy

13. The overarching planning policy relevant to the CWP Project is described in EIAR **Chapter 2 Policy and Legislative Context**.

14. The assessment of the CWP Project against relevant planning policy is provided in the **Planning Report**. This includes planning policy relevant to shipping and navigation.

16.3.3 Guidance

15. It is understood that guidance specific to shipping and navigation assessment will be published by the Marine Survey Office (MSO) in the near future, and that this guidance is likely to closely resemble[1] the Maritime and Coastguard (MCA) MGN 654 (MCA, 2021), which is the primary guidance used for equivalent assessment for United Kingdom (UK) Offshore Renewable Energy Installations (OREIs). Input to date by both the MSO and Irish Lights was that until guidance was in place, developers should apply the principles of MGN 654[2]. Therefore, MGN 654 (MCA, 2021) has been used as the primary guidance document to inform the approach to shipping and navigation assessment.

16. MGN 654 (MCA, 2021) requires the use of the IMO Formal Safety Assessment (FSA) (IMO, 2018). Therefore, the FSA has been used to assess impacts to shipping and navigation users. Further details are provided in **Section 16.4**.

17. Other key guidance documents considered are as follows (noting this includes certain UK guidance where directed by MGN 654 as above):

- Guidance on EIS and NIS Preparation for Offshore Renewable Energy Projects (DCCAE, 2017);
- MGN 372 Amendment 1 (M+F) Guidance to mariners operating in vicinity of UK OREIs (MCA, 2022);
- International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendation O-139 and Guidance (G1162) on the Marking of Man-Made Offshore Structures (IALA, 2021b/2021a); and
- The Royal Yachting Association's (RYA's) Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy. 5th Edition – (RYA, 2019).

16.4 Impact assessment methodology

18. **Chapter 5 EIA Methodology** provides a summary of the general impact assessment methodology applied to the CWP Project, which includes the approach to the assessment of transboundary and inter-related effects. The approach to the assessment of cumulative impacts is provided in **Chapter 5, Appendix 5.1 CEA Methodology**.

19. The following sections confirm the methodology used to assess the potential impacts on shipping and navigation, noting that as detailed in **Section 16.3**, the FSA approach is being applied in line with MGN 654 requirements.

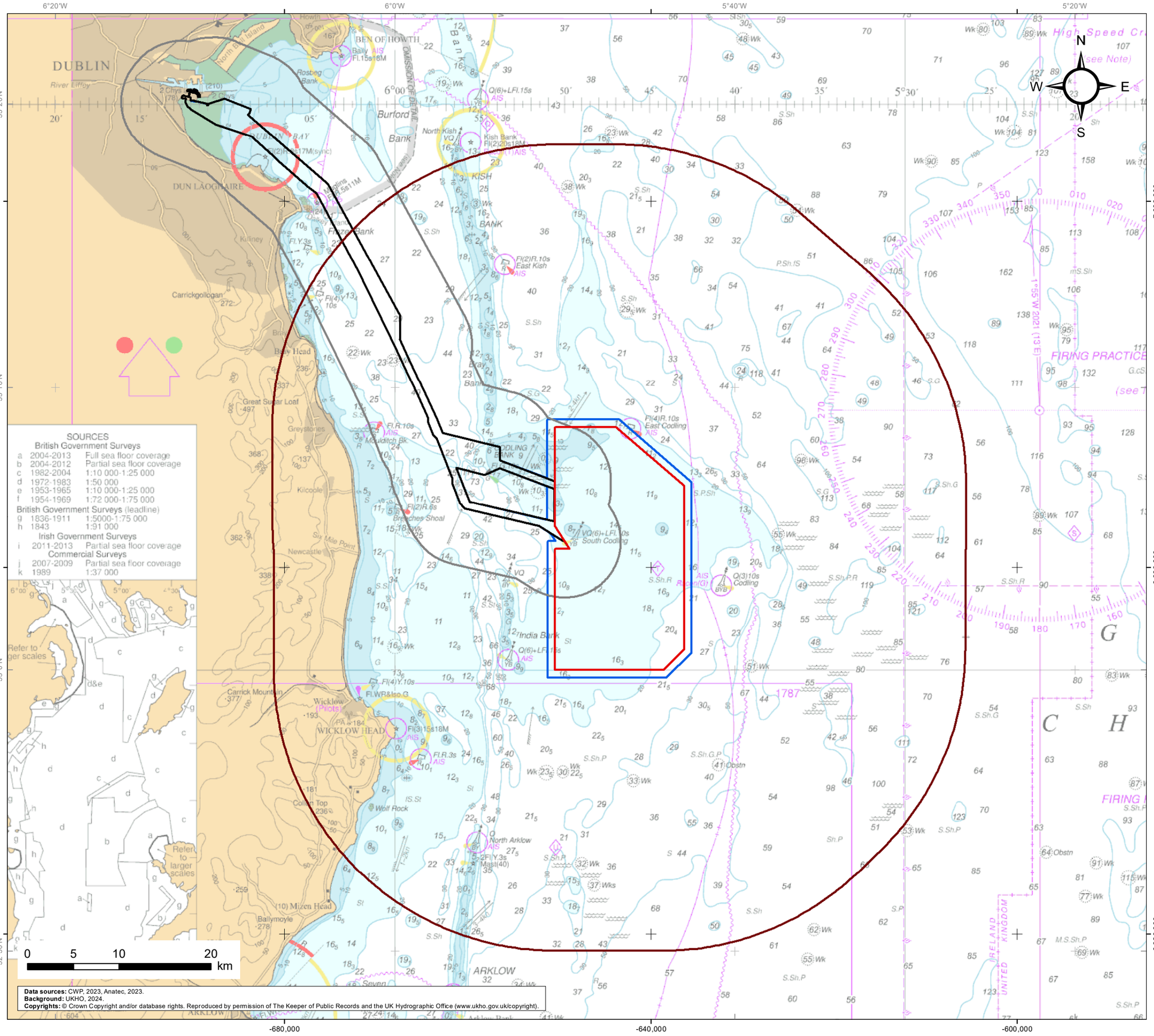
16.4.1 Study area

20. The study area for the shipping and navigation assessment has been defined as a 10 nautical mile (nm) buffer of the array site. This is a standard study area for shipping and navigation for UK OWF developments, given it will typically capture routeing in the surrounding area which may be affected while still remaining site specific to the development being studied. In the case of the CWP Project, this includes all vessels inshore of the array site, in addition to the north / southbound traffic that passes further offshore, and is therefore considered appropriate for the purposes of EIA and NRA.

[1] The draft version of the planned guidance was released for targeted consultation in January 2023 by the Department of Transport (DoT), however it was not yet finalised at the time of writing (April 2024). The contents closely resemble MGN 654.
[2] Note: at the time of consultation the relevant active guidance was MGN 543 which has since been superseded by MGN 654.

21. Additional assessment for the export cables has been undertaken within a 2 nm buffer of the offshore export cable corridor (the 'export cable study area'), noting that this includes a spatial overlap with the 10 nm buffer of the array site.

22. The study area and export cable study area are shown relative to the array site and offshore export cable corridor in **Figure 16-1**.



SOURCES

British Government Surveys

a	2004-2013	Full sea floor coverage
b	2004-2012	Partial sea floor coverage
c	1982-2004	1:10 000-1:25 000
d	1972-1983	1:50 000
e	1953-1965	1:10 000-1:25 000
f	1954-1969	1:72 000-1:75 000

British Government Surveys (leadline)

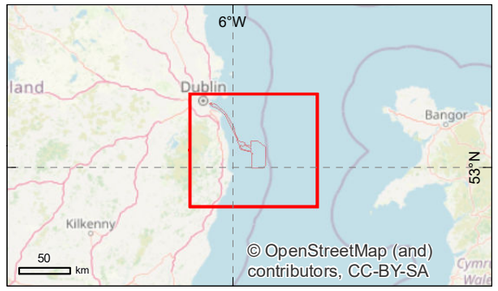
g	1836-1911	1:5000-1:75 000
h	1843	1:91 000

Irish Government Surveys

i	2011-2013	Partial sea floor coverage

Commercial Surveys

j	2007-2009	Partial sea floor coverage
k	1989	1:37 000



Legend

- Array site
- Study area
- Onshore RLB + OECC RLB
- Cable corridor study area
- Planning application boundary

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Project: Codling Wind Park

Contractor: Anatec Limited
Website: www.anatec.com

Figure 16.1
Overview of study area

CWP doc. number: CWP-ANA-ENG-08-01-MAP-0967

Internal descriptive code: POOLB - COnSS - FLOOD.CFRAM

Size: A3
Scale: 1:400,000

CRS: EPSG 3395

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/01/03	DS	PC/EA	CC

16.4.2 Data and information sources

Site specific surveys

23. To ensure that vessels not required to broadcast via Automatic Identification System (AIS) were captured, the Applicant has undertaken three vessel traffic surveys where both AIS and non-AIS vessels were recorded, supplemented with visual observation data where available:

- Vessel based survey undertaken by the *LB Jill* between the 30 April and 25 June 2021;
- Shore based survey based at Wicklow Head Lighthouse between the 25 July and 8 August 2022; and
- Shore based survey based at Wicklow Head Lighthouse between the 20 February and 6 March 2023.

24. This approach has been agreed with Irish Lights, MSO and IRCG (see **Section 16.2**), and the data has formed the primary input into characterising the vessel traffic baseline.

Desk study

25. In addition to the site specific surveys, a comprehensive desk-based review was undertaken to inform the baseline for shipping and navigation. Key data sources used to inform the assessment are set out in **Table 16-2**.

Table 16-2 Data sources

Data	Source	Date	Notes
12 months' AIS data	Combination of satellite and terrestrial receivers	Entirety of 2021	Allowed for long term assessment including capture of seasonal or low use routeing. Does not include non AIS vessels.
RNLI Incident Data	RNLI	2013–2022	Captures any incidents responded to by the RNLI.
Marine Casualty Investigation Board (MCIB) Incident Data	MCIB	1992–2022	Not all incident reports provide precise location details.
United Kingdom Hydrographic Office (UKHO) Admiralty Charts	UKHO	2022	Charts 1410, 1411 and 1415. Analysis based on latest charted information available.

16.4.3 Impact assessment

26. The significance of potential effects has been evaluated using the FSA approach as per **Section 16.3**. The FSA is a structured and systematic methodology based upon risk analysis and a Cost Benefit

Analysis (if applicable) to reduce the impacts to As Low As Reasonably Practicable (ALARP) parameters. The frequency and consequence of each impact is determined based on the findings of the NRA, with significance then being determined via a risk matrix approach. Further details are provided in the proceeding sections.

27. It is noted that the methodology approach was set out to consultees including at dedicated meetings and the Hazard Workshop (see **Section 16.2**).

Frequency of Occurrence

28. The frequency of occurrence rankings applied are presented and defined in **Table 16-3**.

Table 16-3 Criteria for determination of frequency of occurrence

Rank	Description	Criteria
1	Negligible	<1 occurrence per 10,000 years
2	Extremely Unlikely	1 per 100–10,000 years
3	Remote	1 per 10–100 years
4	Reasonably Probable	1 per 1–10 years
5	Frequent	Yearly

Severity of Consequence

29. The severity of consequence rankings applied are presented and defined in **Table 16-4**.

Table 16-4 Criteria for determination of severity of consequence

Rank	Description	Definition			
		People	Property	Environment	Business
1	Negligible	No perceptible effect	No perceptible effect	No perceptible effect	No perceptible effect
2	Minor	Slight injury or injuries	Minor damage to property i.e., superficial damage	Tier 1 local assistance required	Minor reputational impact – limited to users
3	Moderate	Multiple moderate or single serious injury	Damage not critical to operations	Tier 2 limited external assistance required	Local reputational impacts
4	Serious	Multiple serious injuries or single fatality	Damage resulting in critical impact on operations	Tier 2 regional assistance required	National reputation impacts

Rank	Description	Definition			
		People	Property	Environment	Business
5	Major	More than one fatality	Total loss of property	Tier 3 national assistance required	International reputational impacts

Significance of effect

30. The frequency (**Table 16-3**) and consequence (**Table 16-4**) are considered collectively to provide the level of tolerability of an impact based on the tolerability matrix presented in **Table 16-5**. The tolerability of an impact is defined as Broadly Acceptable (low risk), Tolerable (moderate risk), or Unacceptable (high risk).

31. Once identified, the tolerability of an impact is assessed to ensure it is ALARP. Further risk control measures may be required to further mitigate an impact in accordance with the ALARP principles, noting that unacceptable risks are not considered to be ALARP.

32. Impacts that are deemed to be of unacceptable significance or not within ALARP parameters are considered to be significant in EIA terms. Impacts deemed to be broadly acceptable or tolerable and ALARP are not significant in EIA terms.

Table 16-5 Impact assessment matrix for determination of significance of effect

Frequency of Occurrence	Severity of Consequence				
	Major	Serious	Moderate	Minor	Negligible
Frequent	Unacceptable	Unacceptable	Unacceptable	Tolerable	Tolerable
Reasonably Probable	Unacceptable	Unacceptable	Tolerable	Tolerable	Broadly Acceptable
Remote	Unacceptable	Tolerable	Tolerable	Broadly Acceptable	Broadly Acceptable
Extremely Unlikely	Tolerable	Tolerable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable
Negligible	Tolerable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable	Broadly Acceptable

16.5 Assumptions and limitations

33. The long-term dataset is AIS-only and assumes that vessels under legal obligation to broadcast on AIS will do so. However, not all vessels are legally obligated to broadcast on AIS and therefore these vessels may be underrepresented within this dataset. Within each relevant dataset it has been assumed that the details broadcast via AIS are accurate unless there is clear evidence to the contrary.

34. It should be considered that traffic volumes and routeing may have been affected by Brexit within the vessel traffic data sources assessed. There may also be effects from the COVID pandemic, in particular for the 2021 datasets.

35. The Royal National Lifeboat Institution (RNLI) incident data cannot be considered comprehensive of all incidents, as any incident to which an RNLI resource was not mobilised has not been accounted for. Similarly, the Marine Casualty Investigation Board (MCIB) incident data only accounts for incidents that have been subject to a complete investigation. In addition, coordinates are not available for every incident in the MCIB dataset.

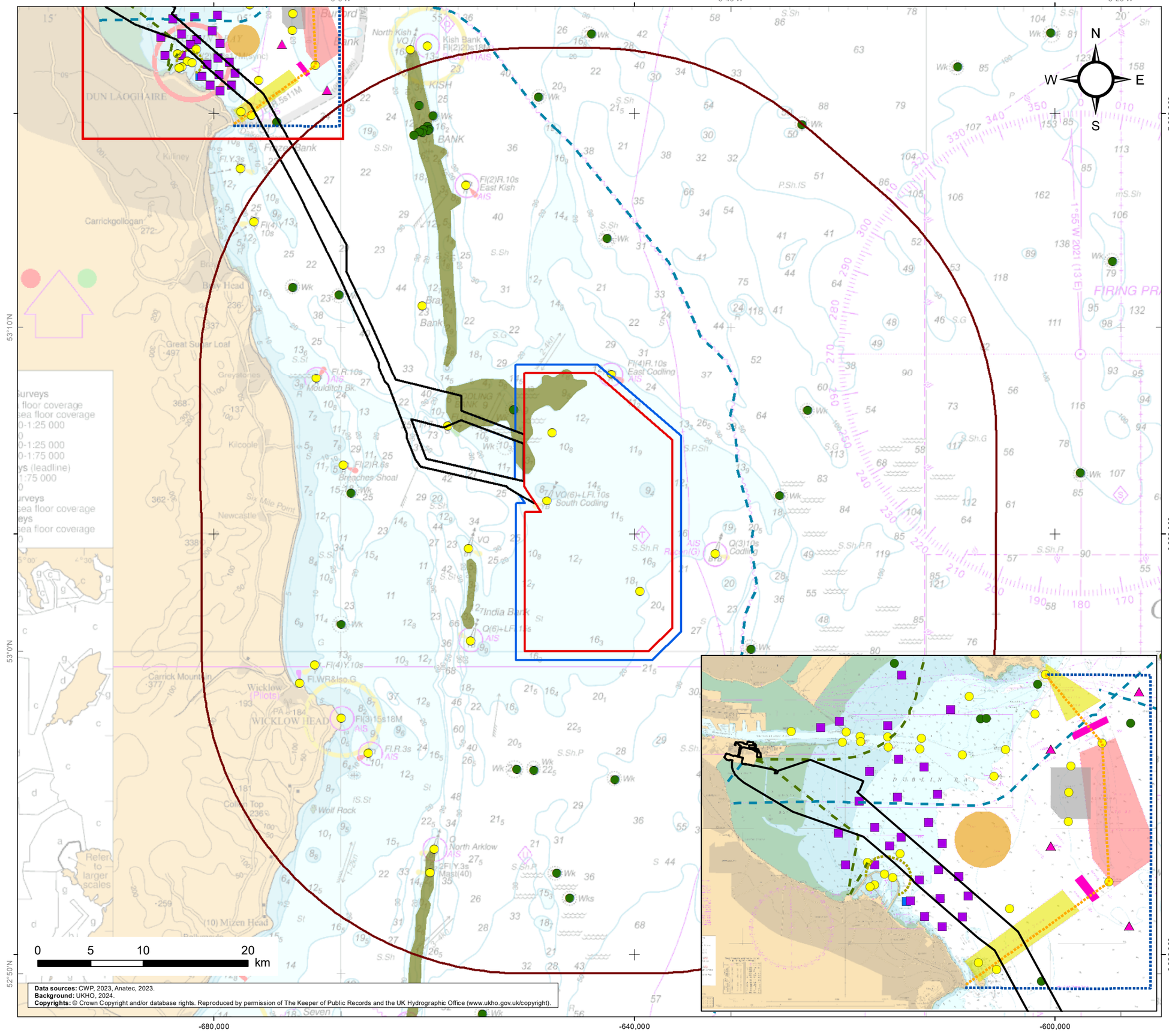
36. The United Kingdom Hydrographic Office (UKHO) Admiralty Charts are updated periodically and therefore the information shown may not reflect the real time features within the region with total accuracy. Additionally, not all navigational features may be charted, e.g., certain aids to navigation and wrecks.

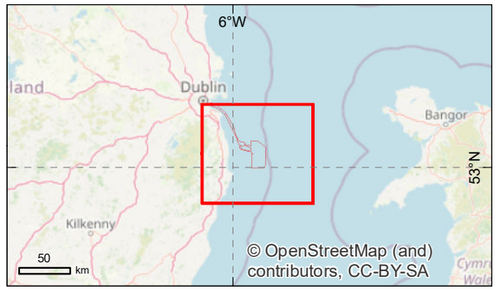
16.6 Existing environment

37. The following sections provide a description of the baseline conditions for shipping and navigation in terms of navigational features, maritime incidents and vessel traffic.

16.6.1 Navigational features

38. The key navigational features identified are shown in **Figure 16-2**, noting that full details are provided in the NRA.





Legend

- Array site
- Study area
- Onshore RLB + OECC RLB
- Planning application boundary

Navigational features

- Aid to navigation
- Race mark
- Arklow Bank wind farm turbine
- Preferred anchorage
- Pilot station
- Wreck or obstruction
- Charted anchorage
- Traffic separation scheme
- Inshore traffic zone
- Shallow bank (10m contours)
- Spoil ground
- Area to be avoided
- Pipeline
- Subsea cable

Authority limit

- Dublin pilotage district
- Dublin port company
- Dun Laoghaire harbour company

Data sources: CWP, 2023, Anatec, 2023.
Background: UKHO, 2024.

codling wind park

Project: Codling Wind Park

Contractor: Anatec Limited
Website: www.anatec.com

Figure 16.2
Navigational features

CWP doc. number: CWP-ANA-ENG-08-01-MAP-0968

Internal descriptive code: POOLB - COnSS - FLOOD.CFRAM

Size: A3
Scale: 1:350,000

CRS: EPSG 3395

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/01/03	DS	PC/EA	CC

39. Vessel routeing in the study area is observed to be primarily dictated by the local shallow banks, notably Codling, Kish, Bray, India and Arklow. As shown within the vessel traffic assessment, vessels tend to avoid the associated shallows and therefore pass either inshore or offshore of the banks. The extents of these banks are marked via buoyage, noting this includes AIS and Racon aids to navigation.

40. Wicklow Harbour is located at the mouth of the Leitrim River, approximately 7 nm to the southwest of the array site. Users include commercial vessels, commercial fishing vessels, and recreational vessels. A key port in the area (and for Ireland as a whole) is Dublin, located 17 nm to the northwest of the array site, noting Dublin Bay is also the landfall location. The vessel traffic analysis shows a notable proportion of commercial vessels in the study area are associated with Dublin.

41. The offshore export cable corridor intersects the inshore traffic zone of South Burford Traffic Separation Scheme (TSS) and passes within 600 metres southwest of the anchorage area within Dublin Bay. Pilot stations are also located at the entrance to Dublin Bay and each are located at least 1 nm from the offshore export cable corridor.

42. The Arklow Bank Wind Park is located approximately 5.5 nm southwest of the array site on the Arklow Bank, and consists of seven turbines. The development was commissioned in 2004.

43. The EXA South cable (a subsea telecommunications cable) is located approximately 1.9 nm to the east of the array site. This cable runs between Ireland and Canada.

44. Charted wrecks are located throughout the study area, with the nearest being approximately 570 m to the west of the site boundary at a depth of 0.6 m below mean sea level, located within Codling Bank.

45. The closest major TSSs to the array site are TSS Off Skerries, approximately 34 nm to the northeast; TSS Off Tuskar Rock, approximately 46 nm to the south; and TSS Off Smalls, approximately 69 nm to the south. There are also two TSS either side of the Burford Bank within Dublin Bay, which provide important access into Dublin Bay.

16.6.2 Maritime incidents

46. A total of 272 incidents were responded to by the RNLI within the study area between 2013 and 2022 (inclusive), corresponding to an average of 27 incidents per year. The most common incident type was *machinery failure*, accounting for 39% of the data. This was followed by *person in danger* which accounted for 23%. Excluding *person in danger* and non-vessel incidents, the most frequent casualty type was powered recreational vessels (44%). The large majority of incidents occurred close to the coast, including a large proportion in or near Wicklow Harbour. It is noted that five incidents occurred within the array site; one classed as *person in danger* and four classed as *machinery failure*.

47. There were three documented MCIB incidents within the study area during the period assessed (1992 to 2021). These incidents occurred inshore of the array site and are as follows:

- An incident in 2000 involving a cargo vessel that grounded;
- An incident in 2000 involving a collision between a fishing vessel and a tanker; and
- An incident in 2008 involving a man overboard from a recreational vessel.

16.6.3 Vessel traffic movements

48. The vessel traffic baseline has been established based on three AIS and Radio Detection and Ranging (Radar) vessel traffic surveys supplemented with a long-term AIS dataset spanning 12 months as set out in **Section 16.4.2**.

49. **Figure 16-3** presents the vessels recorded during the 2021 vessel-based survey, colour coded by vessel type. Following this, **Figure 16-4** presents the vessels recorded during the 14-day 2022 shore-

based survey, colour coded by type, with **Figure 16-5** then presenting the vessels recorded during the final 2023 shore based survey, again colour coded by type.

50. An average of 37 unique vessels per day was recorded within the study area during the 2021 period, which rose to an average of 55 unique vessels per day during the 2022 period. An average of 38 unique vessels per day was recorded during the winter 2023 survey.

51. The increase during the summer 2022 survey was observed to be primarily due to an increased volume of recreational traffic, likely due to the 2022 survey period being in July and August. It is noted that a minor increase in passenger vessel traffic was observed in the 2022 and 2023 data when compared to the 2021 data. This is likely due to COVID effects.

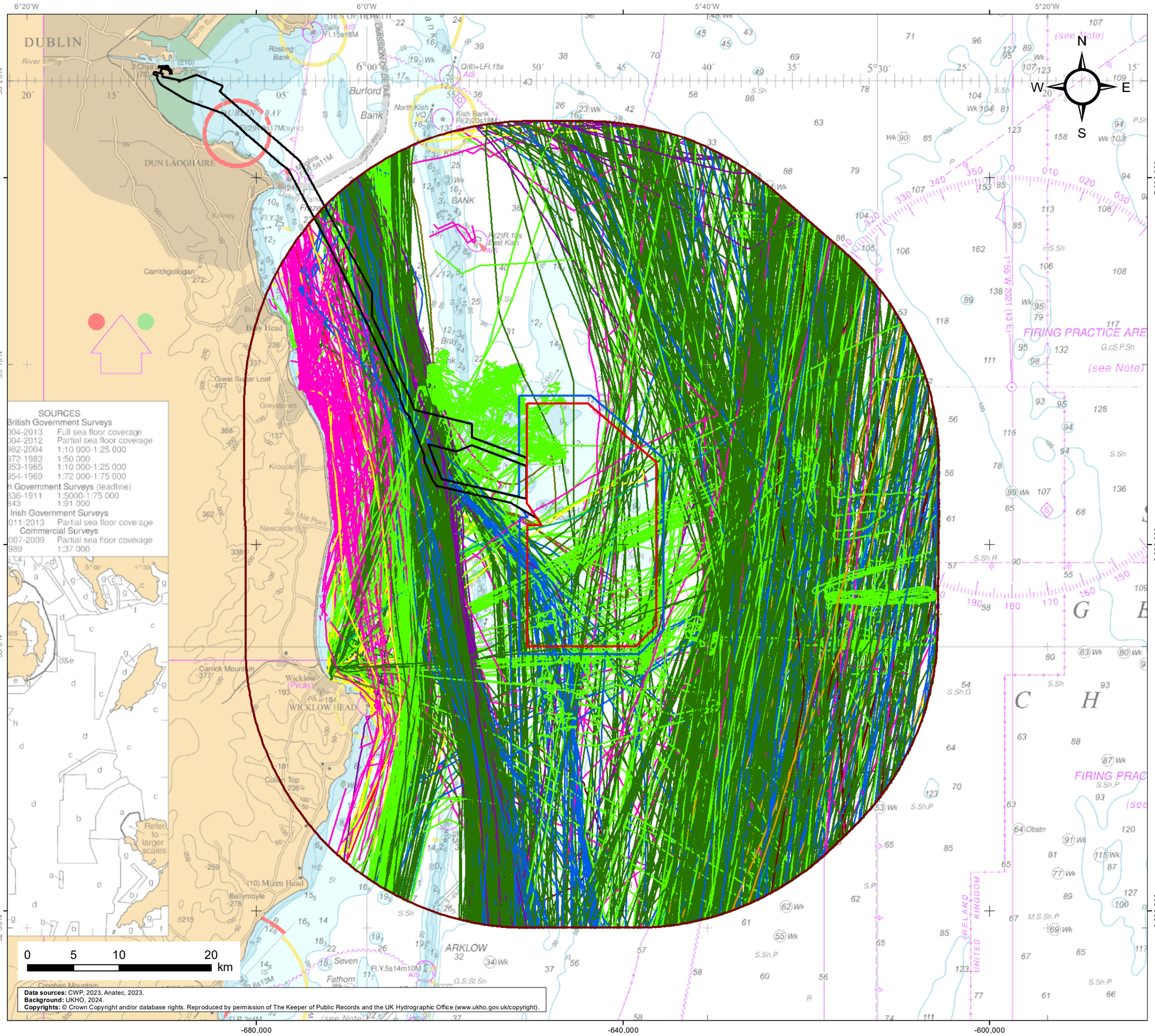
52. During each survey, an average of approximately three vessels per day was recorded within the array site. During the 2021 survey, the most common vessel type seen intersecting the site was fishing, accounting for approximately 45% of intersections. During the 2022 survey, the most common vessel type seen intersecting the array site was recreational, accounting for approximately 35%. Cargo vessels were the most common during the winter 2023 survey.

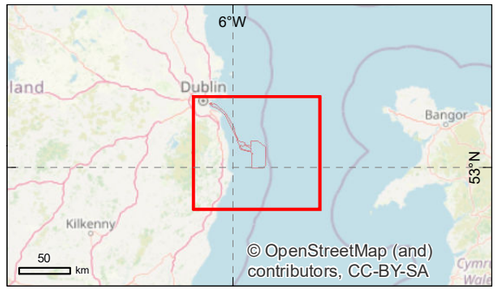
53. The most common vessel type during the 2021 survey was cargo, accounting for 53% of the data. This was followed by fishing (20%), tanker (11%) and recreational (10%). During the 2022 survey, the most common vessel type was recreational, accounting for 35%. This was followed by cargo (29%) and fishing (14%). Cargo vessels were the most common vessel type during the winter 2023 survey (54%), followed by fishing vessels (15%) and tankers (13%).

54. During the 12-month 2021 period and the vessel traffic surveys, commercial routes were observed to avoid the shallow banks in the study area (Kish, Bray, Codling, Arklow), noting that this included routes both inshore and offshore of the banks. The majority of fishing vessels were recorded inshore of the site, with a large proportion in north / south transit. A proportion of fishing vessels was recorded exhibiting active fishing behaviour, including limited activity within the array site itself. The majority of recreational traffic was observed to remain on coastal transits, with only limited transits further offshore.

55. Anchored vessels were also recorded, with the majority being cargo and tanker vessels. These were typically situated south of Dublin (to the northwest of the array site) or north of Wicklow (to the east of the array site).

56. Within the export cable study area, an average of 39 unique vessels per day were identified within the 28-day period studied. The most common vessel type recorded was cargo vessels, accounting for approximately 37% of the total, noting these vessels were associated with Dublin Port. The majority of identified anchored vessel activity within the export cable study area took place within the designated anchorage area within Dublin Bay. Full details of the vessel traffic assessment of the OECC are provided in the NRA.





Legend

Array site
Study area
Onshore RLB + OECC RLB
Planning application boundary

Vessel type

- Unspecified
- Fishing
- Military
- Dredger/underwater ops
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Oil and gas
- Wind farm

codling wind park	*Project:* Codling Wind Park	*Contractor:* Anatec Limited *Website:* www.anatec.com	anatec

Figure 16.3
Vessel traffic by type (57 days summer 2021)

CWP doc. number: CWP-ANA-ENG-08-01-MAP-0969

Internal descriptive code:	*Size:*	*CRS:*
POOLB - COnSS - FLOOD.CFRAM	A3 *Scale:* 1:400,000	EPSG 3395

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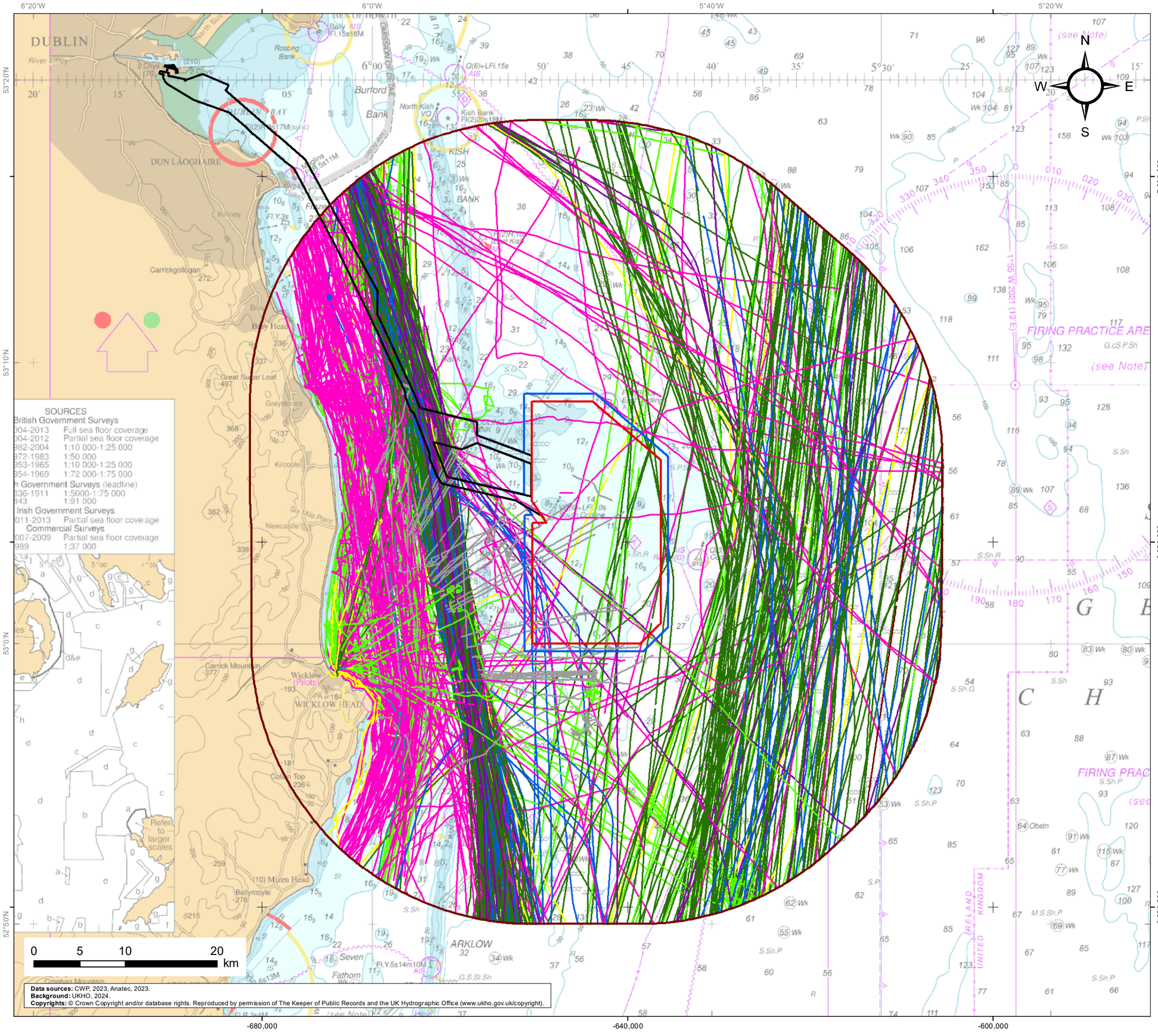
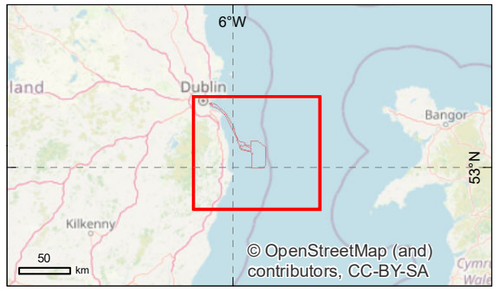
00	Final for issue	2024/01/03	DS	PC/EA	CC





Legend

- Array site
- Study area
- Onshore RLB + OECC RLB
- Planning application boundary

Vessel type

- Unspecified
- Fishing
- Military
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Wind farm

codling wind park

Project: Codling Wind Park

Contractor: Anatec Limited
Website: www.anatec.com

Figure 16.4
Vessel traffic by type (14 days summer 2022)

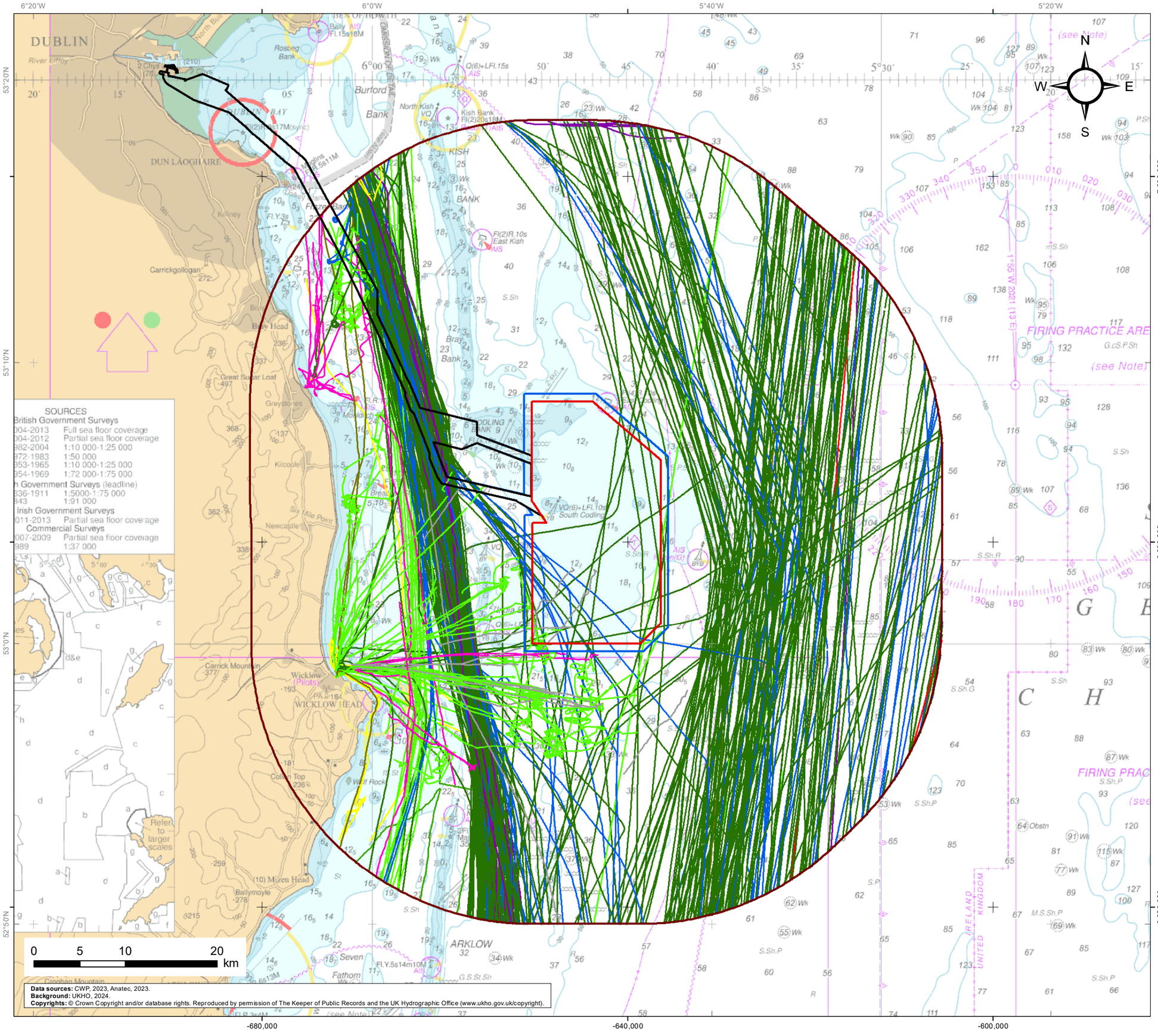
CWP doc. number: CWP-ANA-ENG-08-01-MAP-0970

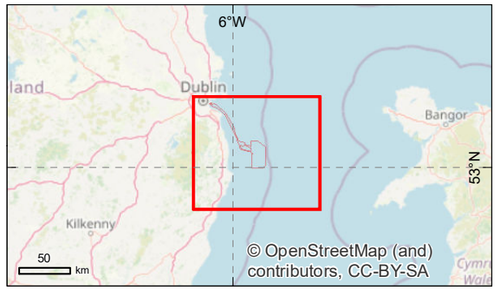
Internal descriptive code: POOLB - COnSS - FLOOD.CFRAM

Size: A3
Scale: 1:400,000

CRS: EPSG 3395

Rev.	Updates	Date	By	Chk'd	App'd
00	Final for issue	2024/01/03	DS	PC/EA	CC





Legend

Array site
Study area
Onshore RLB + OECC RLB
Planning application boundary

Vessel type

- Unspecified
- Fishing
- Dredger/underwater ops
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Wind farm

codling wind park	Project: Codling Wind Park	Contractor: Anatec Limited Website: www.anatec.com	anatec

Figure 16.5
Vessel traffic by type (14 days winter 2023)

CWP doc. number: CWP-ANA-ENG-08-01-MAP-0971

Internal descriptive code:	Size:	CRS:
POOLB - COnSS - FLOOD.CFRAM	Scale: 1:400,000	EPSG 3395

Rev.	Updates	Date	By	Chk'd	App'd
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16.6.4 Climate change and natural trends

57. There is the potential that climate change and measures taken to slow the effects of climate change could have an effect on shipping and navigation. However, given the temporal nature of climate change, any effects are expected to develop in the longer-term (i.e., post the operational life of the CWP Project) rather than the short- or medium-term. Therefore, it is not possible to suitably consider the future baseline for shipping and navigation to account fully for climate change.

16.6.5 Predicted future baseline

58. Future traffic levels are primarily dependent on development of market conditions and fluctuations. They are therefore difficult to predict, noting that ongoing effects of Brexit are still materialising. However, the current accepted trend is that vessel size will increase, as per a study undertaken by the International Transport Forum (ITF) at the Organisation for Economic Cooperation and Development (OECD) on the impact of 'Mega Ships' (OECD / ITF, 2015). This also aligns with the Dublin Port Masterplan (Dublin Port Company, 2018) which includes projections of increases in merchandise trade up to 2040, and plans for port improvements including the capability to accommodate larger vessels.

59. In terms of commercial vessel routeing, no significant changes are likely noting that current routes are dictated by the shallow banks in the area.

16.7 Scope of the assessment

60. An EIA Scoping Report for the Offshore Infrastructure was published on the 6 January 2021. The Scoping Report was uploaded to the CWP Project website and shared with regulators, prescribed bodies and other relevant consultees, inviting them to provide relevant information and to comment on the proposed approach being adopted by the Applicant in relation to the offshore elements of the EIA.

61. Based on responses to the Scoping Report, further consultation and refinement of the CWP Project design, potential impacts to shipping and navigation scoped into the assessment are listed below in **Table 16-6**.

Table 16-6 Potential impacts scoped into the assessment

Impact No.	Description of impact	Notes
Construction		
Impact 1	Vessel displacement leading to increased encounters and collision risk	The presence of construction activities, including a buoyed construction area, may result in vessel displacement for third-party vessels with the reduction in sea room giving rise to an increased likelihood of encounters and collision risk.
Impact 2	Increased collision risk (third party with project vessel)	The presence of vessels associated with construction activities may result in an increased likelihood of encounters and collision risk.
Impact 3	Vessel to structure allision risk (vessel to structure)	The presence of surface structures (complete or partially constructed) may

Impact No.	Description of impact	Notes
		result in the creation of a powered or drifting allision risk.
Impact 4	Reduction in emergency response capability	The presence of construction activities may result in an increased likelihood of an incident requiring emergency response and create access constraints for SAR assets.
Impact 5	Port access restrictions	Impacts on third-party vessels' ability to access local ports.
Operation and Maintenance		
Impact 1	Vessel displacement leading to increased encounters and collision risk	The presence of surface structures may result in vessel displacement for third-party vessels with the reduction in sea room giving rise to an increased likelihood of encounters and collision risk.
Impact 2	Increased collision risk (third party with project vessel)	The presence of vessels associated with maintenance activities may result in an increased likelihood of encounters and collision risk.
Impact 3	Vessel to structure allision risk (vessel to structure)	The presence of surface structures (complete or partially constructed) may result in the creation of a powered or drifting allision risk.
Impact 4	Reduction in emergency response capability	The presence of surface structures and maintenance activities may result in an increased likelihood of an incident requiring emergency response and create access constraints for SAR assets.
Impact 5	Port access restrictions	Impacts on third-party vessels' ability to access local ports.
Impact 6	Reduction in under keel clearance	The presence of cable protection associated with the subsea cables may result in reductions to navigable water depth and an increased underwater allision risk.
Impact 7	Anchor interaction with subsea cables	The presence of subsea cables may result in the creation of an anchor interaction risk.
Decommissioning		
Impact 1	Vessel displacement leading to increased encounters and collision risk	The presence of decommissioning activities, including a buoyed decommissioning area, may result in vessel displacement for third-party vessels with the reduction in sea room giving rise

Impact No.	Description of impact	Notes
		to an increased likelihood of encounters and collision risk.
Impact 2	Increased collision risk (third party with project vessel)	The presence of vessels associated with decommissioning activities may result in an increased likelihood of encounters and collision risk.
Impact 3	Vessel to structure allision risk (vessel to structure)	The presence of surface structures (complete or partially decommissioned) may result in the creation of a powered or drifting allision risk.
Impact 4	Reduction in emergency response capability	The presence of decommissioning activities may result in an increased likelihood of an incident requiring emergency response and create access constraints for SAR assets.
Impact 5	Port access restrictions	Impacts on third-party vessels' ability to access local ports.

62. Based on responses to the Scoping Report, further consultation, refinement of the CWP Project design and the NRA findings, potential impacts to shipping and navigation scoped out of the assessment are listed below in **Table 16-7**.

Table 16-7 Potential impacts scoped out of the assessment

Description of impact	Justification for scoping out
Interference with communications and position fixing equipment	Impact has been assessed within the NRA with consideration of VHF (including direction finding), AIS, NAVTEX, GPS, EMF, marine Radar, SONAR, and noise with generally very low or low frequency of occurrence and very low or low severity of consequence.

16.8 Assessment parameters

16.8.1 General approach

63. Complex, large-scale infrastructure projects with a terrestrial and marine interface, such as the CWP Project, are consented and constructed over extended timeframes. The ability to adapt to changing supply chain, policy or environmental conditions and to make use of the best available information to feed into project design promotes environmentally sound and sustainable development. This ultimately reduces project development costs and therefore electricity costs for consumers and reduces CO_2 emissions.

64. In this regard the approach to the design development of the CWP Project has sought to introduce flexibility where required, among other things, to enable the best available technology to be constructed and to respond to dynamic maritime conditions, whilst at the same time to specify project boundaries, project components and project parameters wherever possible, whilst having regard to known environmental constraints.

65. **Chapter 4 Project Description** describes the design approach that has been taken for each component of the CWP Project. Wherever possible, the location and detailed parameters of the CWP Project components are identified and described in full within the EIAR. However, for the reasons outlined above, certain design decisions and installation methods will be confirmed post-consent, requiring a degree of flexibility in the planning consent.

66. Where necessary, flexibility is sought in terms of:

- Up to two options for certain permanent infrastructure details and layouts, such as the WTG layouts.
- Dimensional flexibility; described as a limited parameter range i.e., upper and lower values for a given detail such as cable length.
- Locational flexibility of permanent infrastructure; described as Limit of Deviation (LoD) from a specific point or alignment.

67. The CWP Project had to procure an opinion from An Bord Pleanála to confirm that it was appropriate that this application be made and determined before certain details of the development were confirmed. An Bord Pleanála issued that opinion on 25 March 2024 (as amended in May 2024) and it confirms that the CWP Project could make an application for permission before the details of certain permanent infrastructure described in **Section 4.3** of **Chapter 4 Project Description** have been confirmed.

68. In addition, the application for permission relies on the standard flexibility for the final choice of installation methods and O&M activities.

69. Notwithstanding the flexibility in design and methods, the EIAR identifies, describes and assesses all of the likely significant impacts of the CWP Project on the environment.

Options and dimensional flexibility

70. Where the application for permission seeks options or dimensional flexibility for infrastructure or installation methods, the impacts on the environment are assessed using a representative scenario approach. A 'representative scenario' is a combination of options and dimensional flexibility that has been selected by the author of this EIAR chapter to represent all of the likely significant effects of the project on the environment. Sometimes, the author will have to consider several representative scenarios to ensure all impacts are identified, described and assessed.

71. For shipping and navigation this analysis is presented in **Appendix 16.2**, which identifies one or more representative scenarios for each impact with supporting text to demonstrate that no other scenarios would give rise to new or materially different effects; taking into consideration the potential impact of other scenarios on the magnitude of the impact or the sensitivity of the receptor(s) that is being considered.

72. **Table 16-8** below presents a summarised version of **Appendix 16.2** and describes the representative scenarios on which the construction and O&M phase shipping and navigation assessment has been based. Where options exist, for each receptor and potential impact, the table identifies the representative scenario and provides a justification for this.

Limit of Deviation

73. Where the application for permission seeks locational flexibility for infrastructure, the impacts on the environment are assessed using a LoD. The LoD is the furthest distance that a specified element of the CWP Project can be constructed.

74. This chapter assesses the specific preferred location for permanent infrastructure. However, **Appendix 16.2** provides further analysis to determine if the proposed LoD for permanent infrastructure may give rise to any new or materially different effects; taking into consideration the potential impact of the proposed LoD on the magnitude of the impact.

75. For shipping and navigation, this analysis is summarised in **Table 16-9**.

Table 16-8 Representative scenario summary

Impact	Representative scenario details	Value	Notes / Assumptions
Construction			
Impact 1: Vessel displacement leading to increased encounters and collision risk	Permanent infrastructure		Vessel displacement will be caused by the presence of surface infrastructure, and therefore the WTGs and OSSs will lead to vessel displacement. During construction, advisory safe passing distances may be used around ongoing works, and a buoyed construction area will be deployed in agreement with Irish Lights. These would not exclude / prohibit entry, but are still likely to lead to vessel displacement based on experience of other constructing wind farms. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures, meaning internal displacement is more likely than WTG Option B, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	
	Length of topside (m)	45	
	Width of topside (m)	35	
	Installation methods and effects		
	Use of construction buoyage	Number and types to be agreed with Irish Lights.	
	Advisory safe passing distances	To be used around sensitive operations and / or structures.	
Impact 2: Increased collision risk (third party with project vessel)	Permanent infrastructure		The presence of wind farm vessels associated with the CWP Project will pose a collision risk to third-party vessels. The greater the number of additional vessels, the larger the collision risk.
	Number of WTGs / foundations	75	
	Number of OSSs	3	
	Installation methods and effects		

Impact	Representative scenario details	Value	Notes / Assumptions
	Peak vessels on site simultaneously	38	WTG Option A is being used as the Representative Scenario for this impact, given it assumes a greater number of project vessel movements (resultant of the greater number of structures), albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Round trips	2,409	
Impact 3: Vessel to structure allision risk (vessel to structure)	Permanent infrastructure		Allision risk will be created via the introduction of new surface piercing structures installed within the array site. Generally, the greater the number of structures, the greater the allision risk. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures, meaning frequency of allision risk is higher than WTG Option B, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	
	Length of topside (m)	45	
	Width of topside (m)	35	
Impact 4: Reduction in emergency response capability	Permanent infrastructure		The presence of structures, project vessels, personnel, and ongoing construction works could lead to an increase in incidents requiring emergency response. The presence of structures may also impact access to or through the area for SAR assets. This requires consideration of structure locations and rotor diameters (due to the impact on SAR helicopters).
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	

Impact	Representative scenario details	Value	Notes / Assumptions
	Length of topside (m)	45	WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures and vessel movements, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Width of topside (m)	35	
	Installation methods and effects		
	Peak vessels on site simultaneously	38	
	Round trips	2,409	
Impact 5: Port access restrictions	Permanent infrastructure		The presence of structures, project vessels, and the export cables in the OECC may lead to restrictions in port access. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures and vessel movements, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	Length of inter-array cabling on the seabed (km)	120–139	
	Length of interconnector cabling on the seabed (km)	7.4–8.6	
	Minimum depth of cover (IACs and ICs) (m)	1	
	Length of inter-array and interconnector cabling requiring cable protection (km)	29.8	
	Height of cable protection berm (IACs and ICs) (m)	1.25	
	Number of OSSs	3	
	Length of OSS topside (m)	45	
	Width of OSS topside (m)	35	
	Number of export cables	3	
	Total length of 3 no. export cables (km)	126.0–146.0	

Impact	Representative scenario details	Value	Notes / Assumptions
	Minimum depth of cover (export cables) (m)	1.4 m (except cable buried within the zone of greater burial depth adjacent to DL Harbour, which will have a trench depth of 3.0 m)	
	Total length of export cables requiring cable protection (km)	15	
	Height of cable protection berm (m) (export cables)	1.5	
	Installation methods and effects		
	Peak vessels on site simultaneously	38	
	Round trips	2,409	
Operations and maintenance			
Impact 1: Vessel displacement leading to increased encounters and collision risk	Permanent infrastructure		Vessel displacement will be caused by the presence of surface infrastructure, and therefore the WTGs and OSSs will lead to vessel displacement. There will be no restrictions on entry into the array site; however, certain vessels are likely to deviate to avoid the structures and therefore there will be displacement. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures, meaning internal displacement is more likely than WTG Option B,
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	
	Length of topside (m)	45	

Impact	Representative scenario details	Value	Notes / Assumptions
	Width of topside (m)	35	albeit neither option results in new or different impacts or impacts of a materially different magnitude.
Impact 2: Increased collision risk (third party with project vessel)	Permanent infrastructure		The presence of wind farm vessels associated with the CWP Project will pose a collision risk to third-party vessels. The greater the number of additional vessels, the larger the collision risk. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures (noting that assumed O&M vessel movements do not change between the two scenarios), albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	Number of OSSs	3	
	Vessels		
	Peak vessel numbers	14	
	Number of vessel round trips	1,209	
Impact 3: Vessel to structure allision risk (vessel to structure)	Permanent infrastructure		Allision risk will be created via the introduction of surface piercing structures installed within the array site. Generally, the greater the number of structures, the greater the allision risk. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures, meaning frequency of allision risk is higher than WTG Option B, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	
	Length of topside (m)	45	
	Width of topside (m)	35	

Impact	Representative scenario details	Value	Notes / Assumptions
Impact 4: Reduction in emergency response capability	Permanent infrastructure		The presence of structures, project vessels, personnel and any maintenance works could lead to an increase in incidents requiring emergency response. The presence of structures may also impact access to or through the area for SAR assets. This requires consideration of structure locations and rotor diameters (due to the impact on SAR helicopters). WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures and vessel movements, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	WTG monopile diameter at mudline (m)	9	
	Rotor diameter (m)	250	
	Blade tip clearance above HAT (m)	34.22	
	Buildout of array area	Full	
	Number of OSSs	3	
	Length of topside (m)	45	
	Width of topside (m)	35	
	Vessels		
	Peak vessel numbers	14	
	Number of vessel round trips	1,209	
Impact 5: Port access restrictions	Permanent infrastructure		The presence of structures, project vessels and the export cables in the OECC may lead to restrictions in port access. WTG Option A is being used as the Representative Scenario for this impact, given it includes a greater number of structures and vessel movements, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Number of WTGs / foundations	75	
	WTG rotor diameter (m)	250	
	Length of inter-array cabling on the seabed (km)	120–139	
	Length of interconnector cabling on the seabed (km)	7.4–8.6	
	Minimum depth of cover (IACs and ICs) (m)	1	

Impact	Representative scenario details	Value	Notes / Assumptions
	Length of inter-array and interconnector cabling requiring cable protection (km)	29.8	
	Height of cable protection berm (IACs and ICs) (m)	1.25	
	Number of OSSs	3	
	Number of export cables	3	
	Total length of 3no. export cables (km)	126.0–146.0	
	Minimum depth of cover (m)	1.4 m (except cable buried within the zone of greater burial depth adjacent to DL Harbour, which will have a trench depth of 3.0 m)	
	Total length of export cables requiring cable protection (km)	15	
	Height of cable protection berm (offshore export cables) (m)	1.5	
	Vessels		
	Peak Vessel Numbers	14	
	Number of Vessel Round Trips	1,209	
Impact 6: Reduction in under keel clearance	Permanent infrastructure		The presence of subsea cables (inter-array cables, interconnector cables, and offshore export cables) may lead to a reduction in navigable depth where cable protection is used.
	Number of WTGs / foundations	75	
	Length of inter-array cabling on the seabed (km)	120–139	

Impact	Representative scenario details	Value	Notes / Assumptions
	Length of interconnector cabling on the seabed (km)	7.4–8.6	WTG Option A is being used as the Representative Scenario for this impact given it includes a greater number of structures and hence a larger total length of subsea cable, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Minimum depth of cover (m) (IACs and ICs)	1	
	Length of inter-array and interconnector cabling requiring cable protection (km)	29.8	
	Height of cable protection berm (m) (IACs and ICs)	1.25	
	Number of OSSs	3	
	Number of Export Cables	3	
	Total length of 3no. export cables (km)	126.0–146.0	
	Minimum depth of cover (m) (export cables)	1.4 (except cable buried within the zone of greater burial depth adjacent to DL Harbour which will have a trench depth of 3.0 m)	
	Total length of export cables requiring cable protection (km)	15	
	Height of cable protection berm (m) (offshore export cables)	1.5	
Impact 7: Anchor interaction with subsea cables	Permanent infrastructure		The presence of subsea cables (inter-array cables, interconnector cables, and offshore export cables) will create a risk of anchor interaction. The greater the length of cable, the greater the potential interaction risk.
	Number of WTGs / foundations	75	
	Length of inter-array cabling on the seabed (km)	120–139	

Impact	Representative scenario details	Value	Notes / Assumptions
	Length of interconnector cabling on the seabed (km)	7.4–8.6	WTG Option A is being used as the Representative Scenario for this impact given it includes a greater number of structures and hence a larger total length of subsea cable, albeit neither option results in new or different impacts or impacts of a materially different magnitude.
	Minimum depth of cover (m) (IACs and ICs)	1	
	Length of inter-array and interconnector cabling requiring cable protection (km)	29.8	
	Number of OSSs	3	
	Number of export cables	3	
	Total length of 3no. export cables (km)	126.0–146.0	
	Minimum depth of cover (m) (offshore export cables)	1.4 (except cable buried within the zone of greater burial depth adjacent to DL Harbour which will have a trench depth of 3.0 m)	
	Total length of export cables requiring cable protection (km)	15	

Decommissioning

It is recognised that legislation and industry best practice change over time. However, for the purposes of the EIA, at the end of the operational lifetime of the CWP Project, it is assumed that all offshore infrastructure will be removed where practical to do so. In this regard, for the purposes of a representative scenario for decommissioning impacts, the following assumptions have been made:

- The WTGs and OSS topsides will be completely removed.
- Following WTG and OSS topside decommissioning and removal, the monopile foundations will be cut below the seabed level, to a depth that will ensure the remaining foundation is unlikely to become exposed. This is likely to be approximately one metre below seabed, although the exact depth will depend upon the sea-bed conditions and site characteristics at the time of decommissioning.

Impact	Representative scenario details	Value	Notes / Assumptions

- All cables and associated cable protection in the offshore environment will be wholly removed. It is likely that equipment similar to that which is used to install the cables may be used to reverse the burial process and expose them. Therefore, the area of seabed impacted during the removal of the cables is anticipated to be the same as the area impacted during the installation of the cables.
- Generally, decommissioning is anticipated to be a reverse of the construction and installation process for the CWP Project and the assumptions around the number of vessels on site and vessel round trips is therefore the same as described for the construction phase of the offshore components.

Given the above it is anticipated that for the purposes of a representative scenario, the parameters will be comparable to those identified for the construction phase, and the same impacts are assessed.

Table 16-9 Limits of deviation summary

Project component	Limit of deviation	Conclusion from Appendix 16.2
WTGs / OSSs (including monopile foundations)	100 m from the centre point of each WTG and OSS location is proposed to allow for small adjustments to be made to the structure locations.	No potential for new or materially different effects
IACs / interconnector cables	100 m either side of the preferred alignment of each IAC and interconnector cable is proposed to allow for small adjustments to be made to the cable alignments.	No potential for new or materially different effects
Offshore export cables	250m either side of the preferred offshore export cable alignments within the array site. The offshore export cable corridor outside of the array site (OECC).	No potential for new or materially different effects

16.9 Primary mitigation measures

76. Throughout the development of the CWP Project, measures have been adopted as part of the evolution of the project design and approach to construction, to avoid or otherwise reduce adverse impacts on the environment. These mitigation measures are referred to as 'primary mitigation'. They are an inherent part of the CWP Project and are effectively 'built in' to the impact assessment.

77. Primary mitigation measures relevant to the assessment of shipping and navigation are set out in **Table 16-10**. Where additional mitigation measures are proposed, these are detailed in the impact assessment (**Section 16.10**). Additional mitigation includes measures that are not incorporated into the design of the CWP Project and require further activity to secure the required outcome of avoiding or reducing impact significance.

Table 16-10 Primary mitigation measures

Project Element	Description
Navigational Safety Plan (NSP)	A Navigational Safety Plan (NSP) has been prepared for shipping and navigation purposes, including the safe navigation of fishing vessels. The NSP includes details of: • Advisory safe passing distances around structures and works; • Marine coordination and communication to manage the movements of project vessels; • Marking of all infrastructure associated with the project (including subsea cables) on appropriately scaled Admiralty Charts; • Procedures in relation to Local Notices to Mariners, to be updated and re-issued during construction and prior to planned maintenance works; • Consultation with the relevant harbour authorities; • Compliance of all project vessels with international marine regulations as adopted by the Flag State, notably the COLREGs and International Convention for the Safety of Life at Sea (SOLAS); and • Use of a guard vessel(s) as deemed appropriate by risk assessment. The NSP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.
Lighting and Marking Plan	A Lighting and Marking Plan (LMP) has been prepared to capture construction and O&M phase lighting requirements for the offshore infrastructure and demarcation of the offshore development area, such as construction buoy requirements. The LMP includes details of: • Marking and lighting of the array site in agreement with Irish Lights and in line with IALA G1162 (IALA, 2021a); • Buoyed construction area around the array in agreement with Irish Lights; and

Project Element	Description
	• Specific requirements in terms of aviation lighting to be installed on the turbines. The LMP will be prepared in consultation with the IAA, DoD and IRCG. It will take into account DoD's requirement for WTGs to be observable to night vision equipment. The LMP will ensure appropriate lighting is in place to facilitate aeronautical safety. The LMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.
Cable protection	The Applicant will, where practicable, bury all cables within the offshore development area: • IACs and interconnector cables will have a minimum depth of cover of 1.0 m; and • Offshore export cables will have a minimum depth of cover of 1.4 m. In cases where burial is inadequate due to unforeseeable seabed conditions, and at cable crossings, cable protection will be implemented as mitigation to avoid risks to other marine operations.
Liaison with SAR resources	An Emergency Response Cooperation Plan (ERCoP) will be in place for the CWP Project. The ERCoP will detail liaison with SAR resources including the IRCG to ensure suitable emergency response plans and procedures are in place. The ERCoP will refer to the marking and lighting of the WTGs and will consider helicopters undertaking SAR operations when rendering assistance to vessels and persons in the vicinity of the offshore development area. This will ensure appropriate lighting is in place to facilitate aeronautical safety during SAR operations.
Minimum blade clearance	All WTGs for both layout options will feature a minimum blade tip clearance of 36 m above Mean Sean Level (MSL) (+37.72m LAT). This is beyond the minimum 22 m clearance above HAT required for safety of navigation and has been set by the Applicant to reduce the potential collision risk for offshore ornithology receptors.
Turbine and layout design	Positions of WTGs and OSSs have been informed by a wide range of site specific data, including metocean data (e.g., wind speed and direction), geophysical and geotechnical survey data (e.g., bathymetry), environmental data (e.g., benthic surveys and archaeological assessment) and stakeholder consultation. Designing and optimising the layout of the WTGs has considered multiple constraints identified from analysis of these datasets, alongside the consideration of layout principles taken from relevant guidance on the design of OWFs. A summary of the key actions taken to avoid or otherwise reduce impacts is provided below:

Project Element	Description
	• The WTG layout options include Search and Rescue (SAR) access lanes to allow a SAR resource to fly on the same orientation continuously through the array site. This is provided to minimise risks to surface vessels and / or SAR resource transiting through the array site. • Archaeological exclusion zones (AEZs) around known features of archaeological interest have been avoided. No works that impact the seabed will be undertaken within the extent of an AEZ during the construction, operational or decommissioning phases. • The locations of offshore infrastructure been developed to avoid known sensitive ecological habitats, including areas with suitable conditions for *Sabellaria spinulosa*, which can form reefs under some circumstances. Whilst reefs were not identified during the characterisation surveys, as an ephemeral feature it will be necessary to validate the results in advance of construction. A pre-construction geophysical survey will therefore be undertaken to facilitate the micro-siting around sensitive habitats such as *Sabellaria spinulosa*. • The WTG layout options have been developed to avoid or minimise interaction with known areas of high fishing density, where possible. As avoidance is not always possible, the layouts have also been developed to increase the potential for coexistence. • A paleochannel (the remnants of a river or stream channel that flowed in the past) in the centre west of the array site has been avoided.
Construction Environmental Management Plan (CEMP)	A Construction Environmental Management Plan (CEMP) has been prepared to provide a management framework, to ensure appropriate controls are in place to manage environmental risks associated with the construction of the CWP Project. It outlines environmental procedures that require consideration throughout the construction process, in accordance with legislative requirements and industry best practice. In summary, the CEMP includes details of: • the Environmental Management Framework for the CWP Project including environmental roles and responsibilities (i.e., ecological clerk of works) and contractor requirements (i.e., method statements for specific construction activities); • mitigation measures and commitments made within the EIAR, Natura Impact Statement (NIS) and supporting documentation for the CWP Project; • measures proposed to ensure effective handling of chemicals, oils and fuels including compliance with the MARPOL convention; • a Marine Pollution Prevention and Contingency Plan to address the procedures to be followed in the event of a marine pollution incident originating from the operations of the CWP Project;

Project Element	Description
	• Emergency Response Plan adhered to in the event of discovering unexploded ordnance; • Offshore biosecurity and invasive species management detailing how the risk of introduction and spread of invasive non-native species will be minimised; and • Offshore waste management and disposal arrangements. The CEMP will be implemented by the Applicant and its appointed contractor(s) and will be secured through conditions of the development consent. It will be a live document which will be updated and submitted to the relevant authority, prior to the start of construction.
Rehabilitation Schedule	A Rehabilitation Schedule is provided as part of the planning application. This has been prepared in accordance with the MAP Act (as amended by the Maritime and Valuation (Amendment) Act 2022) to provide preliminary information on the approaches to decommissioning the offshore and onshore components of the CWP Project. A final Rehabilitation Schedule will require approval from the statutory consultees prior to the undertaking of decommissioning works. This will reflect discussions held with stakeholders and regulators to determine the exact methodology for decommissioning, taking into account available methods, best practice and likely environmental effects.

16.10 Impact assessment

16.10.1 Construction phase

78. The potential environmental impacts arising from the construction of the CWP Project are listed in **Table 16-8**, along with the parameters against which each construction phase impact has been assessed. A description of the potential effect on shipping and navigation receptors caused by each identified impact is given below.

Impact 1: Vessel displacement leading to increased encounters and collision risk

79. The presence of the buoyed construction area, wind farm structures, project vessels and ongoing construction activities may lead to displacement of third-party vessels, leading to an increase in encounters and potentially collision risk.

Commercial vessels

80. Experience of offshore wind farms within the UK demonstrates that commercial vessels will tend to avoid arrays including during construction, and will instead deviate around the buoyed construction

area. This aligned with feedback received during consultation undertaken for the CWP Project including during the hazard workshop (see **Section 16.2**).

81. Based on the assessment of vessel routeing undertaken in the NRA, of the 10 main routes identified, two will require deviation. These deviations are summarised as follows (noting full details are provided in the NRA (**Volume 4, Appendix 16.3: Navigational Risk Assessment**):

- Route 7 is anticipated to pass inshore of the array site. This shortens the journey distance within the study area, noting the associated vessels (1–2 per day) will utilise a smaller area of sea room inshore of the India Bank.
- Route 9 is anticipated to pass offshore of the array site, leading to a deviation of approximately 2.1 nm within the study area. Less than one vessel per day will be affected.

82. The low number of vessels deviating to avoid the array site is reflective of the majority of traffic in the area already avoiding the local shallow banks, including the Codling and India Banks. Given the deviations are expected to be relatively small, it is not anticipated that the construction of the CWP Project will lead to large changes in collision rates. This is reflected in the assessment of change in vessel to vessel collision risk undertaken in the NRA, which estimated that a vessel would be involved in a collision once per 119 years post wind farm, an increase of 10% from the pre wind farm risk. The majority of the change was observed to occur inshore of the array site, where Route 7 utilises less sea room than pre wind farm.

83. Details of the CWP Project will be promulgated in advance of and during construction. Structure positions and the buoyed construction area will also be marked on nautical charts. These measures will ensure mariners have maximum awareness of the CWP Project and are therefore able to account for the structures and associated ongoing construction works in their passage planning. This is likely to result in less severe deviations than the worst case assumptions made in the quantitative assessment.

84. It was raised during the hazard workshop that vessels will also be required to temporarily deviate to avoid the cable installation works, with particular concern raised in relation to the area inshore of the Kish and Bray Banks where navigable sea room is limited by the shallows. As above, promulgation of information will be undertaken to alert vessels to the ongoing works, and interactions will also be managed by COLREGs, noting that they will likely be localised in nature and short term in duration. Therefore, should an encounter incident occur within the export cable study area, the vessels involved are likely to be able to resume their respective passages with no long-term consequences.

85. In the unlikely event that an encounter develops into a collision incident, minor contact is most likely with minor damage to the vessels and no harm to those on board or the environment. As a worst case, one of the vessels could be substantially damaged leading to foundering with Potential Loss of Life (PLL) and pollution.

Fishing and recreational vessels

86. The minimum spacing of 1,000 m for WTGs is considered sufficient to facilitate transits by small vessels, noting that this aligns with feedback received at the hazard workshop (see **Section 16.2**). Furthermore, there would be no restriction on vessel entry into the array site, noting that the CWP Project will promulgate advisory safe passing distances around ongoing works and / or structures to make clear to passing vessels the areas where sensitive operations are being undertaken. Experience of UK offshore wind farms shows that fishing and recreational vessels will tend to avoid buoyed construction areas, however it should be considered that such vessels are more likely to enter into arrays than larger commercial vessels. Consultation feedback received at the hazard workshop (see **Section 16.2**) was that recreational vessels would likely avoid the array site, in particular vessels associated with the local recreational clubs.

87. The baseline data shows that both fishing vessels and recreational vessels do currently transit through the array site. Instances of behaviour indicating active fishing (i.e., gear deployed) were also identified. On this basis it is considered that these vessel types may choose to enter into the array site; however, based on consultation input likely at lower levels than are currently observed, particularly during the construction phase when the buoyed construction area is present.

88. On this basis there may be an increase in smaller craft in the area inshore of the array site. However, it is unlikely that this will represent a large increase in vessel numbers (during the summer 2022 vessel traffic survey an average of approximately one recreational vessel per day intersected the array site). It was raised during the hazard workshop that vessels will also be required to temporarily deviate to avoid the cable installation works, with particular concern raised in relation to the area inshore of the Kish and Bray Banks where navigable sea room is limited by the shallows. As above, promulgation of information will be undertaken to alert vessels to the ongoing works, and interactions will also be managed by COLREGs, noting that they will likely be localised in nature and short term in duration. Therefore, should an encounter incident occur within the export cable study area, the vessels involved are likely to be able to resume their respective passages with no long-term consequences.

89. The consequences should an encounter develop into a collision incident are similar to those outlined for commercial vessels, noting that where a small craft collides with a larger vessel the outcome is more likely to be severe.

Frequency of occurrence

90. Deviations and displacement are expected; however, such displacement is considered unlikely to lead to a collision, and therefore frequency of occurrence is anticipated to be extremely unlikely.

Severity of consequence

91. Severity of consequence of collision is deemed to be serious.

Significance of the risk

92. The frequency of occurrence is considered to be extremely unlikely, and the severity of consequence is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

93. Based on the predicted level of effect, it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9**, and that the risk is ALARP.

Residual effect

94. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 2: Increased collision risk (third party with project vessel)

95. The vessels used for the construction of the CWP Project will lead to increased traffic levels in the area, which may result in increased encounters and collision risk involving a project vessel.

96. Construction ports are yet to be finalised and various options are under consideration. There could be up to 75 maximum construction vessels used, with up to 2,409 total round trips to port.

97. All vessels associated with the construction of the CWP project will comply with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974) regulations and movements will be managed via marine coordination, with project vessels broadcasting via AIS. The CWP Project may also utilise advisory safe passing distances around works, structures, and / or construction vessels to alert passing third-party traffic to areas which should be avoided to minimise collision risk. Moreover, the buoyed construction area will serve to protect project vessels from passing third-party vessels, noting that third-party vessels are not expected to regularly navigate within the buoyed construction area.

98. Details of any advisory safe passing distances in addition to details of the CWP Project and the construction phase will be promulgated to facilitate third-party vessel awareness. These measures will ensure potential interactions between project vessels and third-party vessels are limited.

99. It was raised at the hazard workshop that the cable installation process would require careful planning and management to ensure interaction with third-party traffic was limited. As above details of the associated works will be promulgated, advisory safe passing distances may be used, and any interactions will be managed via COLREGs, noting that they will likely be localised in nature and short term in duration. Therefore, should an encounter incident occur, the vessels involved are likely to able to resume their respective passages with no long-term consequences. Liaison with Dublin Port Company during cable installation is considered necessary.

100. The measures described above are set out in detail in the **Navigational Safety Plan**.

101. In the unlikely event that an encounter develops into a collision incident, the consequences are generally similar to those outlined for collisions between third-party vessels (Impact 1), noting that where a small craft (which could be a project vessel) collides with a larger vessel the outcome is more likely to be severe.

102. As above, construction ports are yet to be finalised. Consultation will be undertaken with the authorities of the chosen ports to ensure vessel movements are safely managed and that safe port access for third-party vessels is not impacted.

Frequency of occurrence

103. Noting the mitigations in place, including promulgation of information, advisory safe passing distances and marine coordination, frequency of occurrence is anticipated to be remote.

Severity of consequence

104. Given the potential for collision, severity of consequence is deemed to be serious.

Significance of the effect

105. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is

determined to be **tolerable**. Where flexibility in the proposed design exists there is no other scenario which would lead to a more significant effect.

Additional mitigation

106. In addition to the primary mitigation described in **Section 16.9**, it is considered necessary to ensure consultation is undertaken with Dublin Port Company and Dún Laoghaire during export cable installation and any other base ports used to agree liaison procedures, and to ensure all CWP Project vessels broadcast via AIS.

Residual effect

107. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable** and **ALARP**, which is not significant in EIA terms.

Impact 3: Vessel to structure allision risk (vessel to structure)

108. The presence of structures within the buoyed construction area during the construction phase will create an allision risk to third-party vessels.

Powered allision

109. Consultation feedback and experience of UK offshore wind farms under construction indicates it is unlikely that commercial vessels will enter into the buoyed construction area. Furthermore, due to the presence of the shallow banks, the significant majority of commercial vessels already avoid the array site. On this basis it is likely that any allision would be with a peripheral structure.

110. For commercial traffic passing inshore, there is already natural separation between the vessels and the array site due to the presence of the Codling and India Banks. It is considered unlikely that vessels would choose to transit between the array site and the banks (and this aligns with hazard workshop feedback), and as such there is potential that vessels on an allision course would ground on the banks prior to making contact with a structure.

111. Based on modelling undertaken in the NRA, it was estimated that a vessel under power would allide with a structure within the array site once per 8,384 years. This is a relatively low level of estimated risk relative to equivalent assessments undertaken for UK offshore wind farm developments and is reflective of the natural inshore separation and the sea room available offshore in addition to vessels generally passing east of the Codling East cardinal mark.

112. Operational mitigations (most notably operational lighting and marking as directed by Irish Lights) will not yet be active during the construction phase. However, construction phase specific mitigation measures will be implemented including promulgation of information, marking on nautical charts, and construction phase lighting and marking as directed by Irish Lights. The CWP Project will also use advisory safe passing distances around structures during the construction phase as directed by risk assessment.

113. Should a powered allision occur, the consequences will depend on multiple factors, including the energy of the contact, structural integrity of the vessel and sea state at the time of the contact. Fishing vessels and recreational vessels are considered most vulnerable to the impact given the potential for a non-steel construction. In such cases, the most likely consequences will be minor damage, with the

vessel able to resume passage and undertake a full inspection at the next port. As a worst case, the vessels could be substantially damaged leading to foundering with PLL and pollution.

Drifting allision

114. As discussed for powered allision risk, it is likely that commercial vessels will avoid the buoyed construction area, and hence a drifting allision is more likely to occur to a peripheral structure than internally. Based on modelling undertaken in the NRA, it was estimated that a drifting vessel would allide with a structure within the array site once per 1,022 years, with the highest risk structures being those located at the southwestern extent of the array site (due to inshore traffic and broadly north / south tides).

115. A vessel drift scenario may only develop into an allision situation if it occurs in proximity to a structure within the array site. This would only be the case where the vessel was either located internally within or in close proximity to the array site, and the direction of the wind and / or tide directs the vessel towards a structure. Should a vessel start to drift towards the array site, the vessel will first initiate its own procedures for such an event, which may involve dropping anchor or the use of thrusters (depending on availability and power supply). This may include an emergency anchoring event which would involve checking relevant nautical charts to ensure that deployment of the anchor will not lead to other risks (such as anchor snagging on a subsea cable) in line with emergency procedures. Given the water depths in the area, use of the anchor to counter a drift is considered feasible (vessel dependent).

116. Furthermore, any vessels on site associated with construction of the CWP Project may be able to provide assistance (depending upon type and capability) in liaison with the IRCG and as required under SOLAS obligations (IMO, 1974).

117. Should a drifting allision occur, the consequences will be similar to those for a powered allision including the unlikely worst case of foundering with PLL and pollution. However, a drifting vessel is likely to make contact with a structure at a reduced speed compared to a powered vessel dependent on the conditions, thus reducing the energy of the contact.

Internal navigation

118. As discussed in relation to displacement (Impact 1), smaller vessels (e.g., fishing and recreation) may choose to enter the array site and as such have additional exposure to allision risk with an internal structure. The minimum spacing between WTG structures of 1,000 m is considered sufficient to allow safe internal navigation, i.e., keeping clear of the structures within the array site. However, given the presence of the buoyed construction area, and experience of UK offshore wind farms, fishing and recreational vessels are likely to avoid entering the under construction array site.

119. Quantitative modelling within the NRA estimated a fishing vessel would make contact with a structure once per 12 years, however it is important to note that this conservatively assumes baseline activity in terms of vessel numbers and proximity to structures will remain unchanged post wind farm. As discussed above it is likely that in reality vessel numbers may decrease, also vessels are likely to account for the presence of the structures (i.e., they will choose appropriate passing distances from structures). Based on historical incident statistics as detailed in the NRA, most likely consequences are minor.

120. As with any passage, any vessel navigating in or near the array site is expected to passage plan in accordance with SOLAS Chapter V (IMO, 1974) and promulgation of information will ensure that such vessels are aware of the works being undertaken and structures present. This will be further assisted by temporary lighting for partially installed structures as directed by Irish Lights.

Frequency of occurrence

121. Noting the mitigations in place including promulgation of information, advisory safe passing distances, marine coordination, and lighting and marking, frequency of occurrence is anticipated to be remote.

Severity of consequence

122. Given the potential for allision, severity of consequence is deemed to be serious.

Significance of the effect

123. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists there is no other scenario which would lead to a more significant effect.

Additional mitigation

124. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

125. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP** which is not significant in EIA terms.

Impact 4: Reduction in emergency response capability

126. The construction of the CWP Project has the potential to lead to an increase in baseline incident rates given an increase in vessel numbers and crew / personnel in the area undertaking the associated construction activities. This may impact upon emergency response resource capability to respond to all incidents that arise.

127. There could be up to 75 maximum construction vessels used, with up to 2,409 total round trips to port.

128. Based on RNLI data assessed within the NRA from 2013–2022, an average of 27 incidents per year were responded to within the study area, five of which took place within the array site. The same data set showed an average of 44 incidents per year in the offshore export cable corridor study area. Based on incident rates observed at under construction offshore wind farms as detailed in the NRA, the likely incident rates associated with the CWP Project are unlikely to increase substantially, noting that project vessels will be compliant with international marine regulations.

129. Emergency response plans will be produced in discussion with relevant SAR bodies, including the IRCG, and this will include cooperation procedures in relation to self-help resources. In this regard it is noted that on site vessels associated with the construction of the CWP Project may be able to assist in an emergency incident in liaison with IRCG and as required under SOLAS obligations.

130. Therefore, the most likely consequences in the event of an emergency response incident in the region is that responders are able to assist without any limitations on capability. As a highly unlikely worst

case, there could be a delay to a response request due to a simultaneous incident associated with the CWP Project leading to PLL and pollution.

131. There is no current active guidance on layout design, however key stakeholders have indicated that the principles within MGN 654 (MCA, 2021) should be considered, noting that the same principles are included in the draft DoT Guidance. In line with this guidance, the WTGs and OSS in both Layouts A and B are arranged in a broad grid pattern and are spaced allowing for SAR access lanes of at least 500 m in width in two lines of orientation. The layouts and SAR access lanes were shared with the IRCG via a consultation meeting in November 2023 (see **Section 16.2**). It is noted that application of LoD to the OSS may mean that lanes adjacent to OSS locations do drop below 500 m (tip to tip); however, in this instance the majority of the array site would still maintain multiple lines of orientation, and as required under MGN 654 a full single line of orientation would remain.

Frequency of occurrence

132. Noting the limited anticipated effects on baseline incident rates and the available self-help resources associated with the CWP Project, frequency of occurrence is assessed as being extremely unlikely.

Severity of consequence

133. Given the potential for PLL and pollution, the severity of consequences is assessed as serious.

Significance of the effect

134. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**.

Additional mitigation

135. It is considered necessary to apply LOD to structures in consultation with the IRCG to ensure suitable SAR access is maintained within the final layout.

Residual effect

136. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 5: Port access restrictions

137. Certain aspects of the construction of the CWP Project including project vessel movements and works, may temporarily lead to restrictions in port access.

138. Given the location of the array site clear of the key shipping routes, there are not considered to be any impacts on port access from the installation of WTGs and OSSs outside of the deviations that have been assessed within the vessel displacement impact.

139. The OECC passes in excess of 1 nm from the South Burford TSS, and nearby charted pilot boarding locations. On this basis the cable installation process is not anticipated to impact commercial vessel routeing into Dublin Bay via the TSS. The OECC intersects the Inshore Traffic Zone into Dublin Bay, however any impact on small vessel access would be infrequent, temporary in nature, and spatially limited to the area immediately around the installation operation.

140. The OECC does pass within the Dún Laoghaire harbour limits, and within 500 m of the harbour entrance at its closest. However, any impact would be temporary in nature, and spatially limited to the area immediately around the installation operation, meaning that access into the harbour would not be blocked.

141. As set out in the **Navigational Safety Plan**, vessel management procedures including marine coordination will be in place to ensure associated impacts from vessels associated with the construction the CWP Project including port access are managed. Associated details would be promulgated including to relevant port and harbour authorities to ensure both the authorities and third-party vessels were aware. This will include Dublin Port and Dún Laoghaire Harbour.

Frequency of occurrence

142. Noting the proximity of the OECC to Dún Laoghaire harbour frequency of occurrence is assessed as being reasonably probable.

Severity of consequence

143. Given port access will not be blocked, the severity of consequences is assessed as minor.

Significance of the effect

144. The frequency of occurrence is considered to be reasonably probable and the severity of consequence of the impact is assessed to be minor. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**.

Additional mitigation

145. In addition to the primary mitigation described in **Section 16.9**, it is considered necessary to ensure consultation is undertaken with Dún Laoghaire Harbour and Dublin Port Company to agree liaison procedures during the cable installation process.

Residual effect

146. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP** which is not significant in EIA terms.

16.10.2 Operation and maintenance

Impact 1: Vessel displacement leading to increased encounters and collision risk

147. The presence of the completed structures and / or associated maintenance operations may lead to displacement of third-party vessels, leading to an increase in encounters and potentially collision risk.

Commercial vessels

148. As discussed in the equivalent construction phase impact, commercial vessels are anticipated to deviate to avoid the buoyed construction area during the construction phase. Based on both experience of operational wind farms in the UK and consultation feedback, it is likely that during the operation and maintenance phase commercial vessels will continue to apply these deviations, which will be well established once the CWP Project is commissioned, and the construction buoyage is removed.

149. On this basis as for the construction phase, of the 10 main routes identified from the baseline data, two are anticipated to require deviation (see NRA for full details):

- Route 7 is anticipated to pass inshore of the array site. This shortens journey distance within the study area, noting the associated vessels (1–2 per day) will utilise a smaller area of sea room inshore of the India Bank.
- Route 9 is anticipated to pass offshore of the array site, leading to a deviation of approximately 2.1 nm within the study area. Less than one vessel per day will be affected.

150. On this basis a low number of vessels will be impacted, and this is reflective of the majority of commercial vessels in the area already avoiding the shallow waters associated with the banks. This aligns with the assessment of change in vessel to vessel collision risk undertaken in the NRA which estimated that a vessel would be involved in a collision once per 119 years post wind farm, an increase of 10% from the pre wind farm risk. The majority of the change was observed to occur inshore of the array site where Route 7 utilises less sea room than pre wind farm.

151. Details of the CWP Project will be promulgated, including marking on nautical charts and notices to mariners for planned maintenance activities. These measures will ensure mariners have maximum awareness of the CWP Project and are therefore able to account for the structures and associated ongoing maintenance works in their passage planning. This is likely to result in less severe deviations than the worst case assumptions made in the quantitative assessment.

152. Should an encounter incident occur, the vessels involved are likely to be able to resume their respective passages with no long-term consequences following application of the COLREGs. In the unlikely event that an encounter develops into a collision incident, minor contact is most likely with minor damage to the vessels and no harm to those on board or the environment. As a worst case, one of the vessels could be substantially damaged leading to foundering with PLL and pollution.

Fishing and recreational vessels

153. The minimum spacing of 1,000 m is considered sufficient to facilitate transits by small vessels, noting that this aligns with feedback received at the hazard workshop (see **Section 16.2**). Furthermore, as for the construction phase there would be no restriction on vessel entry into the array site, noting that the CWP Project may promulgate advisory safe passing distances around ongoing maintenance works and / or structures to make clear to passing vessels the areas which should be avoided. Experience of UK offshore wind farms shows that some fishing and recreational vessels are comfortable navigating

through operational arrays. However, it is noted that consultation feedback received at the hazard workshop (see **Section 16.2**) was that recreational vessels would likely avoid the array site, in particular vessels associated with the local recreational clubs.

154. The baseline data shows that both fishing vessels and recreational vessels do currently transit through the array site. Instances of behaviour indicating active fishing (i.e., gear deployed) were also identified. On this basis it is considered that these vessel types may choose to enter into the array site post wind farm (and potentially will be more likely to do so than during the construction phase); however based on consultation this may be at lower levels than are currently observed.

155. On this basis there may be an increase in smaller craft in the area inshore of the array site. However, it is unlikely that this will represent a large increase in vessel numbers (during the summer 2022 vessel traffic survey an average of approximately one recreational vessel per day intersected the array site).

156. The consequences should an encounter develop into a collision incident are similar to those outlined for commercial vessels, noting that where a small craft collides with a larger vessel the outcome is more likely to be severe.

Frequency of occurrence

157. Given deviations and displacement will be established during the construction phase, frequency of occurrence is anticipated to be extremely unlikely.

Severity of consequence

158. Severity of consequence of collision is deemed to be serious.

Significance of the risk

159. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists there is no other scenario which would lead to a more significant effect.

Additional mitigation

160. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

161. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 2: Increased collision risk (third party with project vessel)

162. The vessels used for the operation and maintenance of the CWP Project will lead to increased traffic levels in the area, which may result in increased encounters and collision risk involving a project vessel.

163. Wicklow Port is the preferred location for the Operations and Maintenance Base (OMB), however this is not yet confirmed, and project vessels may operate out of various Irish east coast ports. There could be up to 1,209 movements from CWP Project vessels on an annual basis during the operation and maintenance phase i.e., less than expected during the construction phase. It is also noted that by the time of the operational phase, third-party vessels will be more familiar with project vessel transits and activities.

164. All vessels associated with the CWP Project will comply with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974) regulations and movements will be managed via marine coordination, with project vessels broadcasting via AIS. The CWP Project may also utilise advisory safe passing distances around major maintenance works, structures and / or operation and maintenance vessels to alert passing third-party traffic to areas which should be avoided to minimise collision risk.

165. Details of any advisory safe passing distances in addition to details of the CWP Project and any major maintenance will be promulgated to facilitate third-party vessel awareness. These measures will ensure potential interactions between project vessels and third-party vessels are limited.

166. The measures described above are set out in detail in the **Navigational Safety Plan**.

167. In the unlikely event that an encounter develops into a collision incident, the consequences are generally similar to those outlined for collisions between third-party vessels (Impact 1), noting that where a small craft (which could be a project vessel) collides with a larger vessel the outcome is more likely to be severe.

168. As above the base port is yet to be finalised, noting a preference for use of Wicklow. Consultation will be undertaken with the authorities of the chosen port to ensure vessel movements are safely managed and that safe port access for third-party vessels is not impacted.

Frequency of occurrence

169. It is anticipated that vessel numbers during the operation and maintenance phase will be lower across the array site and OECC than during the construction phase. Further, once the export cables have been laid, surface operations are not expected unless repair works are required (for example if the cable is damaged due to anchor interaction). The frequency of occurrence is anticipated to be extremely unlikely.

Severity of consequence

170. Given the potential for collision, severity of consequence is deemed to be serious.

Significance of the effect

171. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists there is no other scenario which would lead to a more significant effect.

Additional mitigation

172. In addition to the primary mitigation described in **Section 16.9**, it is considered necessary to ensure consultation is undertaken with Dublin Port Company and Dún Laoghaire during any export cable

maintenance and any other base ports used to agree liaison procedures, and to ensure all CWP project vessels broadcast via AIS.

Residual effect

173. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP** which is not significant in EIA terms.

Impact 3: Vessel to structure allision risk (vessel to structure)

174. The presence of structures within the array site will create an allision risk to third-party vessels.

Powered allision

175. Due to the presence of the shallow banks, the significant majority of commercial vessels already avoid the array site. Based on UK experience, it is unlikely that commercial vessels will enter into the array site once the construction buoyage is removed. On this basis it is likely that any allision would be with a peripheral structure. It is noted that due to the presence of the Codling and India Banks, the removal of construction buoyage may not lead to third-party commercial vessels passing closer to the array site, noting the natural separation that already occurs between the traffic and the array site resultant of the shallows (marked by existing buoyage).

176. Based on modelling undertaken in the NRA, it was estimated that a vessel under power would allide with a structure within the array site once per 8,384 years. This is a relatively low level of estimated risk relative to equivalent assessments undertaken for UK offshore wind farm developments and is reflective of the natural inshore separation and the sea room available offshore.

177. Lighting and marking as directed by Irish Lights and in line with IALA G1162 (IALA, 2021a) will be active during the operation and maintenance phase. The structure locations will also be shown on appropriate nautical charts following installation. These mitigation measures will assist maximising mariner awareness of the CWP Project (noting it is likely mariners will be more familiar with the CWP Project than during the construction phase).

178. Should a powered allision occur, the consequences will depend on multiple factors including the energy of the contact, structural integrity of the vessel and sea state at the time of the contact. Fishing vessels and recreational vessels are considered most vulnerable to the impact given the potential for a non-steel construction. In such cases, the most likely consequences will be minor damage, with the vessel able to resume passage and undertake a full inspection at the next port. As a worst case, the vessels could be substantially damaged leading to foundering with PLL and pollution.

Drifting allision

179. As discussed for powered allision risk, it is unlikely that commercial vessels will enter into the array site once the construction buoyage is removed (and will instead remain on established deviations), and hence a drifting allision is more likely to occur to a peripheral structure than internally. Based on modelling undertaken in the NRA, it was estimated that a drifting vessel would allide with a structure within the array site once per 1,022 years, with the highest risk structures being those located at the southwestern extent of the array site (due to inshore traffic and broadly north / south tides).

180. A vessel drift scenario may only develop into an allision situation if it occurs in proximity to a structure within the array site. This would only be the case where the vessel was either located internally within or in close proximity to the array site, and the direction of the wind and / or tide directs the vessel towards a structure. Should a vessel start to drift towards the array site, the vessel will first initiate its own procedures for such an event, which may involve dropping anchor or the use of thrusters (depending on availability and power supply). This may include an emergency anchoring event which would involve checking relevant nautical charts to ensure that deployment of the anchor will not lead to other risks (such as anchor snagging on a subsea cable) in line with emergency procedures. Given the water depths in the area, use of the anchor counter a drift is considered feasible (vessel dependent).

181. Furthermore, any vessels on site associated with the operation and maintenance of the CWP Project may be able to provide assistance (depending upon type and capability) in liaison with IRCG and as required under SOLAS obligations (IMO, 1974).

182. Should a drifting allision occur, the consequences will be similar to those noted for a powered allision including the unlikely worst case of foundering with PLL and pollution. However, a drifting vessel is likely to make contact with a structure at a reduced speed compared to a powered vessel dependent on the conditions, thus reducing the energy of the contact.

Internal Navigation

183. As discussed in relation to displacement (Impact 1), smaller vessels (e.g., fishing and recreation) may choose to enter into the array site and as such have additional exposure to allision risk with an internal structure. Minimum spacing between WTG structures of 1,000 m is considered sufficient for safe internal navigation i.e., keeping clear of the structures within the array site noting this aligns with hazard workshop feedback.

184. Quantitative modelling within the NRA estimated a fishing vessel would make contact with a structure once per 12 years, however it is important to note that this conservatively assumes baseline activity in terms of vessel numbers and proximity to structures will remain unchanged post wind farm. As discussed above it is likely that in reality vessel numbers may decrease, further, vessels are likely to account for the presence of the structures (i.e., they will choose appropriate passing distances from structures). Based on historical incident statistics as detailed in the NRA, most likely consequences are minor.

185. As with any passage, any vessel navigating in or near the array site is expected to passage plan in accordance with SOLAS Chapter V (IMO, 1974) and promulgation of information will ensure that awareness is maximised. The use of a grid approach for the WTGs will also assist with clear internal navigation and the ID marking system for individual structures will be such as to minimise the risk of a mariner becoming disorientated whilst navigating within the array.

186. For recreational vessels under sail navigating internally within the array site, there is also potential for effects such as wind shear, masking, and turbulence to occur. From previous studies of offshore wind developments, it has been concluded that WTGs do reduce wind velocity downwind of a WTG (MCA, 2022) but no negative effects on recreational vessels have been reported on the basis of the limited spatial extent of the effect and its similarity to experiences when passing a large vessel or close to other large structures (such as bridges) or the coastline. In addition, no practical issues have been raised by recreational users to date when operating in proximity to existing offshore wind developments.

187. For recreational vessels with a mast there is a further allision risk associated with the WTG blades. However, the minimum blade clearance of 34.22 m above HAT is notably in excess of the RYA

recommendation of 22 m above MHWS for minimising allision risk (RYA, 2019) which is also noted in MGN 654.

Frequency of occurrence

188. Noting the mitigations in place frequency of occurrence is anticipated to be remote.

Severity of consequence

189. Given the potential for allision, severity of consequence is deemed to be serious.

Significance of the effect

190. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists there is no other scenario which would lead to a more significant effect.

Additional mitigation

191. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

192. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 4: Reduction in emergency response capability

193. The operation and maintenance of the CWP Project has the potential to lead to an increase in baseline incident rates given an increase in vessel numbers and crew / personnel in the area undertaking the associated activities. This may impact upon emergency response resources capability to respond to all incidents that arise.

194. There could be up to 1,209 movements from CWP Project vessels on an annual basis during the operation and maintenance phase i.e., less than expected during the construction phase.

195. Based on RNLI data assessed within the NRA from 2013–2022, an average of 27 incidents per year were responded to within the study area, five of which took place within the array site. Based on incident rates observed at operational offshore wind farms as detailed in the NRA, the likely incident rates associated with the CWP Project are unlikely to increase substantially, noting that project vessels will be compliant with international marine regulations.

196. Emergency response plans will be produced in discussion with relevant SAR bodies including the IRCG, and this will include cooperation procedures in relation to self-help resources. In this regard it is noted that on site vessels associated with the operation and maintenance of the CWP Project may

be able to assist in an emergency incident in liaison with IRCG and as required under SOLAS obligations.

197. Therefore, the most likely consequences in the event of an emergency response incident in the region is that responders are able to assist without any limitations on capability. As a highly unlikely worst case, there could be a delay to a response request due to a simultaneous incident associated with the CWP Project leading to PLL and pollution.

198. There is no current active guidance on layout design, however key stakeholders have indicated that the principles within MGN 654 (MCA, 2021) should be considered, noting that the same principles are included in the draft DoT Guidance. In line with this guidance the WTGs and OSS in both Layouts A and B are arranged in a broad grid pattern and are spaced allowing for SAR access lanes of at least 500m in width in two lines of orientation. The layouts and SAR access lanes were shared with the IRCG via a consultation meeting in November 2023 (see **Section 16.2**). It is noted that application of LoD to the OSS may mean that lanes adjacent to OSS locations do drop below 500 m (tip to tip), however in this instance the majority of the array site would still maintain multiple lines of orientation, and as required under MGN 654 a full single line of orientation would remain.

Frequency of occurrence

199. Noting the limited anticipated effects on baseline incident rates and the available self-help resources associated with the CWP Project, frequency of occurrence is assessed as being extremely unlikely.

Severity of consequence

200. Given the potential for PLL and pollution, the severity of consequence is assessed as serious.

Significance of the effect

201. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

202. It is considered necessary to apply LOD to structures in consultation with the IRCG to ensure suitable SAR access is maintained within the final layout.

Residual effect

203. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 5: Port access restrictions

204. Certain aspects of the operation of the CWP Project, including project vessel movements and maintenance works, may lead to restrictions in port access.

205. Given the location of the array site clear of the key shipping routes, there are not considered to be any impacts on port access from the WTGs and OSSs outside of the deviations that have been assessed within the vessel displacement impact.

206. The OECC passes in excess of 1 nm from the South Burford TSS, and nearby charted pilot boarding locations. On this basis, any cable maintenance requiring surface vessel presence is not anticipated to impact commercial vessel routeing into Dublin Bay. The OECC intersects the Inshore Traffic Zone into Dublin Bay, however any impact on small vessel access would be infrequent, temporary in nature and spatially limited to the area immediately around the maintenance operation.

207. The OECC does pass within the Dún Laoghaire harbour limits, and within 500 m of the harbour entrance at its closest. However, any impact from maintenance works would be infrequent, temporary in nature and spatially limited to the area immediately around the installation operation, meaning that access into the harbour would not be blocked.

208. As set out in the **Navigational Safety Plan**, vessel management procedures, including marine coordination, will be in place to ensure associated impacts from vessels associated with the CWP Project, including port access, are managed. Associated details would be promulgated including to relevant port and harbour authorities to ensure both the authorities and third-party vessels were aware. This will include Dublin Port and Dún Laoghaire Harbour.

209. In terms of the export cables within the OECC, The Applicant is aware that Dún Laoghaire-Rathdown County Council (DLRCC), as the owner and operator of Dún Laoghaire Harbour, have future aspirational growth plans which will potentially see up to two approach channels dredged into Dún Laoghaire Harbour. At this stage there is no information within the public domain; however, DLRCC have provided sufficient detail to enable CWP Project to identify and plan areas of deeper burial which will ensure no impediment to the future growth aspirations of Dún Laoghaire Harbour. Whilst there is insufficient information to undertake a detailed cumulative effect assessment, the anticipated development timescales for Dún Laoghaire Harbour are such that it is not predicted that there will be a cumulative effect as CWP Project is anticipated to be constructed in advance of Dún Laoghaire Harbour's dredging proposals and there is no temporal overlap for cumulative effects to occur.

210. The Applicant has also designed the Planning Application Boundary such that works associated with the Dublin Port turning circle will not be impeded by works associated with the CWP Project.

Frequency of occurrence

211. Noting the likely infrequent nature of cable maintenance and the NSP, frequency of occurrence is assessed as being remote.

Severity of consequence

212. Given port access will not be blocked, the severity of consequences is assessed as minor.

Significance of the effect

213. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be minor. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **broadly acceptable**.

Additional mitigation

214. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

215. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **broadly acceptable**, which is not significant in EIA terms.

Impact 6: Reduction in under keel clearance

216. The Applicant will, where practicable, bury all cables to a minimum depth of cover. In cases where depth of cover is inadequate due to unforeseeable seabed conditions, cable protection will be implemented as mitigation to avoid risks to other marine operations. A preliminary cable burial risk assessment, involving a peer review of environmental considerations, ground conditions and anticipated installation considerations, has been undertaken to identify locations that may require cable protection. This exercise has determined an anticipated maximum extent and volume of cable protection within the array site and OECC, which has been used as a basis for the EIA.

217. The presence of cable protection associated with the CWP Project could reduce navigable water depths, leading to an increase in under keel interaction risk to passing traffic. This was raised as a key concern during the hazard workshop in terms of the section of the OECC within Dublin Bay; in particular the use of cable protection reducing navigable depths in the approach to Dún Laoghaire Harbour.

218. Consultation undertaken showed that for some areas of the bay, particularly the entrance to Dún Laoghaire Harbour, any water depth reduction would be intolerable to key stakeholders. On this basis, the Applicant has committed to not reducing water depths within the approach to Dún Laoghaire Harbour.

219. In all other areas of the OECC and array site, the Applicant will apply the approach required under MGN 654 (MCA, 2021), whereby water depths relative to chart datum will not be reduced by more than 5% without consulting with the MSO and Irish Lights. This approach aligns with the draft wording of the draft DoT guidance.

220. Independent of this, the cables will be displayed on nautical charts and details will also be circulated, including to the relevant local yacht clubs in the area.

221. The foundation types being used for the CWP Project (monopiles) are such that there are no associated concerns with under keel clearance, in contrast to the use of floating foundation technology. Further, the structures will form additional AtoNs over the shallows of the local banks, marking the potential grounding hazard.

222. Should an underwater allision occur, the most likely consequences are minor damage to the vessel with the resumption of passage and full inspection undertaking at the next port. As an unlikely worst case, the vessel could be substantially damaged leading to foundering with PLL and pollution.

Frequency of occurrence

223. Noting the mitigation including minimum depth of cover, frequency of occurrence is assessed as being remote.

Severity of consequence

224. The severity of consequence is assessed as moderate.

Significance of the effect

225. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be moderate. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

226. In addition to the primary mitigation described in **Section 16.9**, the Applicant is also committing to not reducing water depths in the approach to Dún Laoghaire. Any potential reductions of more than 5% elsewhere in the OECC or array site will be consulted on with Irish Lights and the MSO.

Residual effect

227. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 7: Anchor interaction with subsea cables

228. The presence of subsea cables associated with the CWP Project present a risk of interaction with vessel anchors. There are various different scenarios which could lead to cable interaction with a vessel anchor, including:

- A vessel drops anchor over a subsea cable in an emergency;
- The deployed anchor of a vessel fails to embed, and the vessel subsequently drags anchor over a subsea cable;
- A vessel departs an anchorage but neglects to raise anchor and subsequently drags anchor over a subsea cable;
- The anchor is deployed over a subsea cable negligently, with the vessel unaware of the subsea cable presence, or the vessel incorrectly judges the position / location of the subsea cable; or
- The anchor is deployed over a subsea cable accidentally via human error or mechanical failure.

229. For the inter-array and interconnector cables, these will be located wholly within the array site. Therefore, it is considered unlikely that a vessel would choose to anchor in close proximity to an inter-array or interconnector cable. This is furthered by the vessel traffic data collected which did not identify any anchoring activity within 5 nm of the array site.

230. For the OECC, the vessel traffic data collected identified anchoring activity both within the designated anchorage area within Dublin Bay and further south, near Bray Harbour. The designated anchorage area is located approximately 600 m northeast of the OECC and is utilised by cargo vessels and tankers. The average length of the vessels utilising the anchorage over the 28 days of AIS data studied in the NRA was 135 m, with the largest vessel being 292 m. The available data and consultation indicated non AIS anchoring would typically occur in Scotsman's Bay.

231. Given the position of the relevant anchoring locations (and noting the presence of the cables on nautical charts), the likelihood of direct anchor interaction with an offshore export cable resultant of planned anchoring is considered very low, including account of LoD of the offshore export cables. This aligns with outputs of the hazard workshop, where general consensus was that any interaction was more likely to result from emergency anchoring (as opposed to planned anchoring). In particular, drifting scenarios in proximity to hazards (e.g., shallow banks, WTGs, port approaches), where a vessel may choose to drop anchor over or in proximity to a cable rather than drifting towards the hazard.

232. Minimum depth of cover and any external protection will be determined via the cable burial risk assessment, and will take into account the size of anchors, based on the size and type of vessels recorded in the area. Traffic volumes will also be considered, i.e., where dragged or emergency anchoring interactions are most likely. Indicatively, the minimum depth of cover is between 1.4 m for offshore export cables (except cable buried within the zone of greater burial depth adjacent to Dún Laoghaire Harbour, which will have a minimum depth of cover of 3.0 m) and 1 m for inter-array cables and interconnector cables. With suitable depth of cover and / or protection of the cables, as determined via the cable burial risk assessment process, the likelihood of an anchor interaction is considered low.

233. Should a vessel anchor over a cable, the most likely consequences are that no interaction occurs given the mitigation in place i.e., cable protection. In the unlikely event that an interaction does occur, historical incidents suggest that the consequences would be negligible for the vessel, with no damage caused. However, damage could be inflicted to the cable. As a worst case, an anchor snagging could occur to a smaller vessel (such as a fishing vessel), with damage incurred to the anchor and stability of the vessel compromised.

Frequency of occurrence

234. Noting the mitigations in place, including minimum depth of cover and protection, frequency of occurrence is assessed as being extremely unlikely.

Severity of consequence

235. Given the outcome of an anchor interaction is not expected to have substantial effects on navigational safety, severity of consequence is deemed to be minor.

Significance of the effect

236. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be minor. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **broadly acceptable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

237. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9**.

Residual effect

238. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **broadly acceptable**, which is not significant in EIA terms.

16.10.3 Decommissioning phase

Impact 1: Vessel displacement leading to increased encounters and collision risk

239. The presence of the buoyed decommissioning area, wind farm structures, project vessels and ongoing decommissioning activities may lead to displacement of third-party vessels, leading to an increase in encounters and potentially collision risk.

240. Since the removal of structures and cables are expected to be largely the reverse of the installation procedure, this impact is considered similar in nature to the equivalent construction phase impact. However, cables may be left in situ; this will be determined in consultation with stakeholders and regulators, with exposed cables more likely to be removed to ensure they do not become a hazard.

241. The buoyed decommissioning area will be analogous to the buoyed construction area and therefore the vessel deviations considered for the equivalent construction phase impact are again applicable.

Frequency of occurrence

242. Given deviations and displacement will be established during the construction phase, frequency of occurrence is anticipated to be extremely unlikely.

Severity of consequence

243. Severity of consequence of collision is deemed to be serious.

Significance of the risk

244. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

245. Based on the predicted level of effect, it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

246. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 2: Increased collision risk (third party with project vessel)

247. The vessels used for the decommissioning of the CWP Project will lead to increased traffic levels in the area, which may result in increased encounters and collision risk involving a project vessel.

248. The removal of structures and cables are expected to be largely the reverse of the installation procedure. However, cables may be left in situ; this will be determined in consultation with stakeholders and regulators, with exposed cables more likely to be removed to ensure they do not become a hazard. Therefore, the numbers of decommissioning vessels and round trips to port is expected to be similar or lower than for the equivalent construction phase impact.

249. Mitigation measures relevant for the equivalent construction phase impact will again be relevant. These include the use and promulgation of advisory safe passing distances, compliance of vessel associated with the decommissioning of the CWP Project with the COLREGs (IMO, 1972/77) and SOLAS (IMO, 1974), management of project vessels via marine coordination and the use of a buoyed decommissioning area analogous to the buoyed construction area. Therefore, the impact is considered similar in nature to the equivalent construction phase impact.

Frequency of occurrence

250. Noting the mitigations in place, including promulgation of information, advisory safe passing distances and marine coordination, frequency of occurrence is anticipated to be remote.

Severity of consequence

251. Given the potential for collision, severity of consequence is deemed to be serious.

Significance of the risk

252. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

253. In addition to the primary mitigation described in **Section 16.9**, it is considered necessary to ensure consultation is undertaken with Dublin Port Company and Dún Laoghaire during any export cable decommissioning works and any other base ports used to agree liaison procedures, and to ensure all CWP project vessels broadcast via AIS.

Residual effect

254. With the implementation of additional mitigation, the significance of the residual effect is predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 3: Vessel to structure allision risk (vessel to structure)

255. The presence of structures within the buoyed decommissioning area during the decommissioning phase will create an allision risk to third-party vessels.

256. There is limited experience of third-party vessel movements in proximity to an offshore wind farm during decommissioning works. However, the buoyed decommissioning area will be analogous to the buoyed construction area and so it can be expected that vessels will treat the decommissioning works similarly to the construction works (in terms of passing distances and decisions to navigate internally within the array site).

257. Furthermore, mitigation measures relevant for the equivalent construction phase impact will again be relevant. These include promulgation of information, marking on nautical charts and decommissioning phase lighting and marking as directed by Irish Lights. The CWP Project may also use advisory safe passing distances around structures during the decommissioning phase.

258. For a drifting allision, the same factors outlined for the equivalent construction phase are relevant. These include where the drifting vessel was initially located, direction of the wind and / or tide and the initiation of procedures by the vessel for a drifting event, including emergency anchoring.

Frequency of occurrence

259. Noting the mitigations in place including promulgation of information, advisory safe passing distances, marine coordination, and lighting and marking, frequency of occurrence is anticipated to be extremely unlikely.

Severity of consequence

260. Given the potential for allision, severity of consequence is deemed to be serious.

Significance of the risk

261. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**. Where flexibility in the proposed design exists, there is no other scenario which would lead to a more significant effect.

Additional mitigation

262. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

263. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 4: Reduction in emergency response capability

264. The decommissioning of the CWP Project has the potential to lead to an increase in baseline incident rates, given an increase in vessel numbers and crew / personnel in the area undertaking the associated decommissioning activities. This may impact upon emergency response resource capability to respond to all incidents that arise.

265. The removal of structures and cables are expected to be largely the reverse of the installation procedure. However, cables may be left in situ; this will be determined in consultation with stakeholders and regulators, with exposed cables more likely to be removed to ensure they do not become a hazard. Therefore, the numbers of decommissioning vessels and round trips to port is expected to be similar or lower than for the equivalent construction phase impact.

266. Noting the similar process for removal of structures and cables compared to the installation procedure, the likely incident rates associated with the CWP Project are unlikely to increase substantially, as per the construction phase. Again, project vessels will be compliant with international marine regulations and be able to assist in an emergency incident in liaison with IRCG and as required under SOLAS obligations.

Frequency of occurrence

267. Noting the limited anticipated effects on baseline incident rates and the available self-help resources associated with the CWP Project, frequency of occurrence is assessed as being extremely unlikely.

Severity of consequence

268. Given the potential for PLL and pollution, the severity of consequences is assessed as serious.

Significance of the risk

269. The frequency of occurrence is considered to be extremely unlikely and the severity of consequence of the impact is assessed to be serious. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **tolerable**.

Additional mitigation

270. It is considered necessary to apply LoD to structures in consultation with the IRCG to ensure suitable SAR access is maintained within the final layout.

Residual effect

271. With the implementation of additional mitigation, the significance of the residual effect is therefore predicted to be **tolerable and ALARP**, which is not significant in EIA terms.

Impact 5: Port access restrictions

272. Certain aspects of the decommissioning of the CWP Project, including project vessel movements and works, may lead to restrictions in port access.

273. Given the location of the array site clear of the key shipping routes, there are not considered to be any impacts on port access from the decommissioning of WTGs and OSSs outside of the deviations that have been assessed within the vessel displacement impact.

274. The OECC passes in excess of 1 nm from the South Burford TSS and nearby charted pilot boarding locations. On this basis, any associated decommissioning works are not anticipated to impact commercial vessel routeing into Dublin Bay.

275. The OECC does pass within the Dún Laoghaire harbour limits, and within 500 m of the harbour entrance at its closest. However, any impact would be temporary in nature, and spatially limited to the area immediately around the decommissioning operation, meaning that access into the harbour would not be blocked.

276. As set out in the **Navigational Safety Plan**, vessel management procedures, including marine coordination, will be in place to ensure associated impacts from vessels associated with the CWP Project, including port access, are managed. Associated details would be promulgated including to relevant port and harbour authorities to ensure both the authorities and third-party vessels were aware. This will include Dublin Port and Dún Laoghaire Harbour.

Frequency of occurrence

277. Noting the likely infrequent nature of cable maintenance and the NSP, frequency of occurrence is assessed as being remote.

Severity of consequence

278. Given port access will not be blocked, the severity of consequences is assessed as minor.

Significance of the effect

279. The frequency of occurrence is considered to be remote and the severity of consequence of the impact is assessed to be minor. Therefore (as per the matrix in **Table 16-5**), the significance of risk is determined to be **broadly acceptable**.

Additional mitigation

280. Based on the predicted level of effect it is concluded that no additional mitigation is required beyond the primary mitigation described in **Section 16.9** and that the risk is ALARP.

Residual effect

281. With no additional mitigation required, the significance of the residual effect is therefore predicted to be **broadly acceptable**, which is not significant in EIA terms.

16.11 Cumulative impacts

282. A fundamental component of the EIA is to consider and assess the potential for cumulative effects of the CWP Project with other projects, plans and activities.

283. **Appendix 16.1** presents the findings of the Cumulative Effects Assessment for shipping and navigation, which considers the residual effects alongside the potential effects of other proposed and reasonably foreseeable developments. In summary, there are anticipated to be no significant cumulative effects for shipping and navigation during the construction, operation or decommissioning phases.

16.12 Transboundary impacts

284. Transboundary impacts in terms of vessel routeing (including to international ports) are considered to have been assessed within **Section 16.10** and in **Appendix 16.1 Cumulative Effects Assessment**. Individual transits may have the potential to be associated with vessels that are internationally owned or located; however, any such transits have been captured within the baseline assessment of vessel traffic as per **Section 16.6** (noting further detail and assessment is provided in the NRA).

285. As such, no transboundary impacts other than those already assessed are anticipated.

16.13 Inter-relationships

286. The inter-related effects assessment considers the potential for all relevant effects across multiple topics to interact, spatially and temporally, to create inter-related effects on a receptor group. This includes incorporating the findings of the individual assessment chapters to describe potential additional effects that may be of greater significance when compared to individual effects acting on a receptor group. An assessment of inter-related effects on shipping and navigation is an inherent part of the formal NRA presented in **Appendix 16.3**. The key inter-relationships are with commercial fisheries which, again, is an inherent part of the formal NRA as it considers the potential impact of the CWP project construction vessels interacting with fishing vessels. The potential exists for spatial and temporal interactions between deviations resulting in vessel collision risk, vessel to structure allision risk and diminished emergency response capability. The greatest scope for potential interactions between impacts could arise from the following:

- a. The interaction of collision risk and displacement of vessel traffic on shipping receptors; and
- b. The interaction of vessel allision risk and displacement vessel traffic on shipping receptors.

287. With regards to interaction (a), the displacement of routeing vessel traffic may lead to an increase in encounters and therefore vessel to vessel collisions; however, this has been fully assessed in the NRA. Whilst impacts to vessels may interact, this would not be in such a way as to increase the significance of any of the individual effect significances (i.e., broadly acceptable).

288. With regard to interaction (b), impacts to vessels arising from allision with offshore structures, and also from displacement of routeing vessel traffic, are mutually exclusive as a vessel will not simultaneously exhibit a high level of displacement from the area (due to the wind farm) and a high level of allision risk with the wind farm structures. Impacts to vessels would not therefore interact.

289. **Chapter 5 EIA Methodology** provides a matrix to show at a broad level where across the EIAR interactions between effects on different receptor groups have been identified.

16.14 Potential monitoring requirements

290. Monitoring requirements for the CWP Project will be described in the **In Principle Project Environmental Monitoring Plan** (IPPEMP), submitted alongside the EIAR and further developed and agreed with stakeholders prior to construction.

291. The assessment of impacts on shipping and navigation as a result of the construction, operation and maintenance, and decommissioning phases of the CWP Project are predicted to be not significant in EIA terms. Based on the predicted impacts it is concluded that no additional specific monitoring is required (outside of that assumed as embedded mitigation as per **Section 16.9** i.e., cable protection monitoring). However, the potential need for vessel traffic monitoring via AIS during and following the completion of construction will be discussed with the MSO prior to the start of construction. This would allow the effectiveness of the mitigation measures being deployed to be assessed based on the changes to vessel traffic movements compared to that estimated in the NRA.

16.15 Impact assessment summary

292. This chapter of the EIAR has assessed the potential environmental impacts on shipping and navigation from the construction, operation and maintenance, and decommissioning phases of the CWP Project. Where significant impacts have been identified, additional mitigation has been considered and incorporated into the assessment.

293. This section, including **Table 16-11**, summarises the impact assessment undertaken and confirms the significance of any residual effects, following the application of additional mitigation.

16.15.1 Scope of the chapter

294. This chapter has considered the potential impacts of the CWP Project on shipping and navigation receptors during the construction, operation and maintenance, and decommissioning phases. To do this, consideration has been given to:

- Consultation feedback from shipping and navigation stakeholders;
- Relevant legislation, policy and guidance;
- Existing environment and the predicted future baseline; and
- Project description.

295. A methodology has been developed for undertaking the impact assessment with consideration of various relevant receptors as appropriate including:

- Commercial vessels;
- Commercial fishing vessels in transit;
- Recreational vessels;
- Anchored vessels;
- Local ports and related services; and
- Emergency responders.

296. The following potential impacts have been assessed (for all phases unless stated otherwise):

- Impact 1: Vessel displacement leading to increased encounters and collision risk;
- Impact 2: Increased collision risk (third party with project vessel);
- Impact 3: Vessel to structure allision risk (vessel to structure);
- Impact 4: Reduction in emergency response capability;

- Impact 5: Port Access Restrictions;
- Impact 6: Reduction in under keel clearance (operation and maintenance only); and
- Impact 7: Anchor interaction with subsea cables (operation and maintenance only).

16.15.2 Key consultation

297. Consultation has been undertaken with key stakeholders through EIA scoping, consultation events, ongoing topic specific meetings, regular operator outreach and the Hazard Workshop. Feedback has been received, principally from MSO, Irish Lights, IRCG, RNLI and Dublin Port, noting feedback from vessel operators and local recreational organisations has also been incorporated.

16.15.3 Impact assessment methodology

298. A methodology for undertaking the impact assessment has been developed inclusive of study areas and data sources. Consideration has been given to the overarching EIA methodology provided in **Chapter 5**, although the FSA approach (IMO, 2018) has been adopted for shipping and navigation, noting that this is required by MGN 654 (MCA, 2021). The FSA approach centres on reducing impacts to ALARP parameters following consideration of the frequency of occurrence and severity of consequence (with mitigation measures applied). A tolerability matrix is then used to determine the significance of effect from the frequency and consequence, with broadly acceptable and tolerable risks considered not significant in EIA terms. Where necessary and identified, additional mitigation measures may then be applied to give a residual significance of risk.

16.15.4 Summary of impact assessment findings

299. The impact assessment has concluded that the significance of risk for all potential impacts is **broadly acceptable** or **tolerable and ALARP**, which is not significant in EIA terms (assuming implementation of additional mitigation where necessary under the FSA).

300. The significance of risk for each potential impact was determined with consideration of the following primary mitigation measures:

- NSP;
- LMP;
- Cable burial / protection;
- Liaison with SAR resources;
- Minimum blade clearance;
- Turbine and layout design;
- CEMP; and
- Rehabilitation Schedule.

Table 16-11 Summary of potential impacts and residual effects

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Construction						
Impact 1: Vessel displacement leading to increased encounters and collision risk	All third-party vessels	Extremely unlikely	Serious	Tolerable	None	Tolerable (**not significant**)
Impact 2: Increased collision risk (third party with project vessel)	All third-party vessels	Remote	Serious	Tolerable	Regular liaison with Dún Laoghaire Harbour and Dublin Port Company during construction and maintenance phases, in particular during cable installation and maintenance works. All CWP project vessels to broadcast via AIS.	Tolerable (**not significant**)
Impact 3: Vessel to structure allision risk (vessel to structure)	All third-party vessels	Remote	Serious	Tolerable	None	Tolerable (**not significant**)

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Impact 4: Reduction in emergency response capability	All third-party vessels, emergency responders	Extremely unlikely	Serious	Tolerable	IRCG will be consulted on the final WTG / OSS layout to inform IRCG where LoD has been implemented.	Tolerable (**not significant**)
Impact 5: Port access restrictions	Port services and users	Reasonably probable	Minor	Tolerable	Regular liaison with Dún Laoghaire Harbour and Dublin Port Company during construction and maintenance phases, in particular during cable installation and maintenance works.	Tolerable (**not significant**)
Operation and Maintenance						
Impact 1: Vessel displacement leading to increased encounters and collision risk	All third-party vessels	Extremely unlikely	Serious	Tolerable	None	Tolerable (**not significant**)

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Impact 2: Increased collision risk (third party with project vessel)	All third-party vessels	Extremely unlikely	Serious	Tolerable	Regular liaison with Dún Laoghaire Harbour and Dublin Port Company during construction and maintenance phases, in particular during cable installation and maintenance works. All CWP project vessels to broadcast via AIS.	Tolerable (**not significant**)
Impact 3: Vessel to structure allision risk (vessel to structure)	All third-party vessels	Remote	Serious	Tolerable	None	Tolerable (**not significant**)
Impact 4: Reduction in emergency response capability	All third-party vessels, emergency responders	Extremely unlikely	Serious	Tolerable	IRCG will be consulted on the final WTG / OSS layout to inform IRCG where LoD has been implemented.	Tolerable (**not significant**)

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Impact 5: Port Access Restrictions	Port services and users	Remote	Minor	Broadly acceptable	None	Broadly acceptable (**not significant**)
Impact 6: Reduction in under keel clearance	All third-party vessels	Remote	Moderate	Tolerable	In the approaches to Dún Laoghaire Harbour all CWP cable infrastructure will be buried. MSO and Irish Lights will be consulted on the final cable alignments to inform any areas where there is a reduction in water depth >5%.	Tolerable (not significant)
Impact 7:Anchor interaction with subsea cables	Anchored vessels	Extremely unlikely	Minor	Broadly acceptable	None	Broadly acceptable (**not significant**)
Decommissioning						
Impact 1: Vessel displacement leading to increased encounters and collision risk	All third-party vessels	Extremely unlikely	Serious	Tolerable	None	Tolerable (**not significant**)

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Impact 2: Increased collision risk (third party with project vessel)	All third-party vessels	Remote	Serious	Tolerable	Regular liaison with Dún Laoghaire Harbour and Dublin Port Company during construction and maintenance phases, in particular during cable installation and maintenance works. All CWP project vessels to broadcast via AIS.	Tolerable (**not significant**)
Impact 3: Vessel to structure allision risk (vessel to structure)	All third-party vessels	Extremely unlikely	Serious	Tolerable	None	Tolerable (**not significant**)
Impact 4: Reduction in emergency response capability	All third-party vessels, emergency responders	Extremely unlikely	Serious	Tolerable	IRCG will be consulted on the final WTG / OSS layout to inform IRCG where LoD has been implemented.	Tolerable (**not significant**)

Potential Impact	Receptor	Frequency of occurrence	Severity of consequence	Significance of effect	Additional Mitigation	Residual effect
Impact 5: Port Access Restrictions	Port services and users	Remote	Minor	Broadly acceptable	None	Broadly acceptable (**not significant**)

16.16 References

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