Environmental Impact Assessment Report

NISA

North Irish Sea Array

Volume 9: Appendices (Offshore)

Appendix 17.3 Lighting and Marking Plan

Statkraft

CIP Copenhagen Infrastructure Partners

GoBe APEM Group

ARUP

North Irish Sea Array
Offshore Wind Farm
Vessel Management Plan

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Presented to	North Irish Sea Array Windfarm Ltd
Date	7th May 2024
Revision Number	01
Document Reference	A4628-NISA-VMP-01

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Revision Number	Date	Summary of Change
00	29th March 2024	Initial Draft
01	7th May 2024	Final

Table of Contents

1 Introduction 1
2 Navigational Safety Measures during Construction/ Decommissioning ... 2
2.1 Marine Coordination 2
2.2 Temporary Lighting and Marking 2
2.3 Guard Vessels 3
2.4 Advisory Safe Passing Distances 3
2.5 Cable Laying and Other RAM Operations 3
2.6 Emergency Response Cooperation Planning 4
3 Navigational Safety Measures during O&M 5
3.1 Marine Coordination 5
3.2 Operational Lighting and Marking 5
3.3 Guard Vessels 5
3.4 Advisory Safe Passing Distances 6
3.5 Emergency Response Cooperation Planning 6
4 Promulgation of Information 7
4.1 Notice to Mariners 7
4.1.1 NtM Issued Prior to the Commencement of Construction 8
4.1.2 NtM upon Commissioning and During O&M 8
4.1.3 Post Commissioning 8
4.1.4 Decommissioning 8
4.2 Marine Notices 8
4.3 Fishing Vessels 9
4.4 Radio Navigational Warnings 9
4.5 Incident Reporting 9
5 Vessel Movements 10
5.1 Construction Phase 10
5.2 O&M Phase 10
5.3 Decommissioning Phase 11
6 Project Vessel Routeing 12
7 Anchoring 13
7.1 Anchorage Areas 13
7.1.1 Project Vessel Anchoring 13
7.1.2 Summary of NRA Findings 13
7.1.3 Areas to avoid when Anchoring 13
8 References 15

Table of Figures

Figure 7.1 Anchorage Areas 14

Table of Tables

Table 4.1 Content of NtM/ Marine Notice 7
Table 5.1 Maximum Vessel Numbers per Construction Activity 10
Table 5.2 Maximum Vessel Numbers per O&M Activity 10

Abbreviations Table

Abbreviation	Definition
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
AtoN	Aid to Navigation
CIP	Copenhagen Infrastructure Partners
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CTV	Crew Transfer Vessel
EIAR	Environmental Impact Assessment Report
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IRCG	Irish Coast Guard
JUV	Jack-up Vessel
LMP	Lighting and Marking Plan
MCIB	Marine Casualty Investigation Board
MSO	Marine Survey Office
NAVAREA	Navigation Area
NISA	North Irish Sea Array
nm	Nautical Mile
NRA	Navigational Risk Assessment
NtM	Notice to Mariners
O&M	Operation and Maintenance
RAM	Restricted in their Ability to Manoeuvre
SOLAS	Safety of Life at Sea
SOV	Service Operation Vessel
UKHO	United Kingdom Hydrographic Office
VHF	Very High Frequency
VMP	Vessel Management Plan
WGS84	World Geodetic System 1984
WTG	Wind Turbine Generator

1 Introduction

1. It has been identified through the Navigational Risk Assessment (NRA) process (**Volume 9, Appendix 17.1: Navigational Risk Assessment**) that maintaining documented vessel management procedures is a necessary mitigation to ensure associated risks are within As Low as Reasonably Practicable (ALARP) parameters for the North Irish Sea Array (NISA) Wind Farm (hereafter 'the proposed development'), a planned offshore wind farm located in Irish waters approximately 9.5 nautical miles (nm) east off the coast of Drogheda.

2. On this basis, this Vessel Management Plan (VMP) has been produced to document the associated measures that will be in place. The document covers the following:

   - Specific measures to be implemented during the construction phase;
   - Specific measures to be implemented during the operation and maintenance (O&M) phase;
   - Measures to be implemented during the decommissioning phase;
   - How information relating to the proposed development will be promulgated;
   - Approach to indicative transit corridors from relevant ports to the array area;
   - Consideration for areas where anchoring may occur and where it will not occur.

3. The decommissioning phase is anticipated to represent a similar scenario to the construction phase in terms of increased vessel activity and therefore similar procedures will be applied (see Section 2). This is referenced where appropriate in this document, noting that the VMP will be reviewed in advance of the decommissioning phase.

2 Navigational Safety Measures during Construction/ Decommissioning

2.1 Marine Coordination

The Developer will establish a marine coordination function which will be used during the construction and decommissioning phases. This will represent a central control base with overarching responsibility for ensuring impacts from project vessels to third party traffic are minimised. Measures in place on this basis to be managed by the marine coordinator will include as a minimum:

- Permission for construction vessels to enter the construction area, for example using a Permit to Work system (noting that third-party vessels will not require permission);
- Liaison with vessels with regards to agreed routeing destinations/ berth/ anchorage (where applicable, and noting that compliance with the Convention on the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) will remain the navigational priority at all times i.e., the marine coordinator will provide project vessels with relevant information as opposed to direct instruction on routeing);
- Monitor vessels and personnel via communication with vessels and Automatic Identification System (AIS) for any potential vessel access conflicts;
- Defining of advisory safe passing distances (see Section 2.4);
- Obtain and provide localised weather information for project vessels to plan the work being undertaken;
- Being the central internal contact point for contractors in case of an emergency; and
- Issuing of Notices to Mariners (NtM) (see Section 4.1).

2.2 Temporary Lighting and Marking

4. Based on consultation to date including with Irish Lights and at the hazard workshop, it is proposed that during the construction phase, all structures will be marked via temporary lighting, and a temporary buoyage construction area will be used to mark the overall site. This will minimise allision risk, and alert passing mariners of the presence of the structures and works within the array area.

5. The process by which the temporary lights will be removed relative to the activation of the operational lighting and marking will be agreed with Irish Lights as part of the Lighting and Marking Plan (LMP) process. A LMP has been included with the Environmental Impact Assessment Report (EIAR) (see **Volume 3, Appendix 17.2: Lighting and Marking Plan**) and is compliant with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Guidance on the Marking of Offshore Man-Made Structures G1162 (IALA, 2021).

6. Lighting and marking to be implemented during decommissioning will be agreed with Irish Lights; however, it is anticipated to likely be similar to that used during the construction phase in terms of use of temporary buoyage.

2.3 Guard Vessels

7. Guard vessels may be required at the proposed development at particular times during all phases, for example when other project vessels are particularly vulnerable due to partially completed works or a particular construction activity. During these periods, the construction area will be monitored by guard vessel(s) to further protect the area and to provide additional information to third-party vessels.

8. The decision(s) on when to use a guard vessel will be informed by a dynamic risk assessment process for the activities required to construct the proposed development.

2.4 Advisory Safe Passing Distances

9. There is currently no framework by which statutory safety zones can be deployed by developers at Irish offshore wind farms. However, the Developer may utilise advisory safe passing distances around infrastructure or works associated with the construction and decommissioning phases. These advisory safe passing distances will be promulgated via the means set out in Section 4, and will serve to alert passing mariners to potential hazards.

2.5 Cable Laying/Burial and Other RAM Operations

10. Restricted in their Ability to Manoeuvre (RAM) vessels will likely be utilised during the cable installation works and heavy lifting operations, and during decommissioning. RAM vessels are such as a result of the nature of the work they are undertaking and therefore are restricted in avoiding an approaching vessel(s). All RAM vessels involved in the construction of the proposed development will comply with the COLREGs (IMO, 1972/77). All vessels, regardless of their nationality, are required to comply with this convention to ensure that they do not interact with vessels that are restricted in their navigational ability.

11. RAM vessels will display lights and shapes to indicate their restrictions. They will transmit safety warnings on Very High Frequency (VHF) to inform other vessels of their actions using the ‘Sécurité’ message if the messages contain important information relating to navigation. Communications between RAM vessels and the marine coordinator will be ongoing throughout the operations.

12. RAM vessels will comply with vessel type regulation information transmitted through AIS and show current navigational status at all times to ensure other vessels equipped with AIS can identify that they are RAM.

13. Cable laying and burial activities will also be promulgated through the notification procedure, and, if necessary following internal risk assessment, guard vessels (see Section 2.3) or advisory safe passing distances (see Section 2.4) may be deployed during the cable laying and burial period.

14. Decommissioning will likely require similar types of activities involving RAM vessels, and therefore it is anticipated that similar measures will apply.

2.6 Emergency Response Cooperation Planning

15. The Developer will work with the Irish Coast Guard (IRCG) to develop a document that bridges the proposed development's emergency response plans and those of the IRCG. This document will detail the procedures by which the Developer will cooperate with IRCG in the event of an emergency incident.

16. The plan will be reviewed in advance of decommissioning and in liaison with IRCG.

3 Navigational Safety Measures during O&M

3.1 Marine Coordination

17. A marine coordinator will be in employed during the O&M phase. This may be in a different location to during the construction phase (see Section 2.1); however, the overarching responsibilities will remain the same. On this basis responsibilities will include at a minimum:

- Permission for vessels to enter the array area, for example using a Permit to Work system (noting that third-party vessels will not require permission);
- Liaison with vessels with regards to agreed routeing destinations/ berth/ anchorage (where applicable, and noting that compliance with COLREGs will remain the navigational priority at all times i.e., the marine coordinator will provide project vessels with relevant information as opposed to direct instruction on routeing);
- Monitor vessels and personnel via communication with vessels and AIS for any potential vessel access conflicts;
- Defining of advisory safe passing distances (see Section 2.4);
- Obtain and provide localised weather information for project vessels to plan any maintenance work being undertaken;
- Being the central internal contact point for contractors in case of an emergency; and
- Issuing of NtMs (see Section 4.1).

3.2 Operational Lighting and Marking

18. Consultation has indicated that Irish Lights will expect the Developer to comply with the IALA G1162 Guidance on the Marking of Offshore Man-Made Structures (IALA, 2021). Precise marine lighting and marking to be implemented during the O&M phase will be agreed with Irish Lights via the LMP process. A LMP has been included with the EIAR (**Volume 3, Appendix 17.3: Lighting and Marking Plan**) which is compliant with IALA G1162.

3.3 Guard Vessels

19. As for the construction phase (see Section 2.3), guard vessels may be required at the proposed development at particular times, for example when other project vessels are particularly vulnerable during major maintenance activity. During these periods, the works will be monitored by guard vessel(s) to further protect the area and to provide additional information to third-party vessels.

20. The decision(s) on when to use a guard vessel will be informed by a dynamic risk assessment process for the activities required to maintain the proposed development.

3.4 Advisory Safe Passing Distances

21. As noted in Section 2.4, there is currently no framework by which statutory safety zones can be deployed by developers at Irish offshore wind farms. However, the Developer may utilise advisory safe passing distances around project infrastructure or maintenance works. These advisory safe passing distances will be promulgated via the means set out in Section 4, and will serve to alert passing mariners to potential hazards.

3.5 Emergency Response Cooperation Planning

22. As noted in Section 2.6, the Developer will work with the IRCG to develop a document that bridges the proposed development's emergency response plans and those of the IRCG. This document will detail the procedures by which the Developer will cooperate with IRCG in the event of an emergency incident, and will be updated in advance of the O&M phase with any relevant details (e.g., as built locations of structures).

4 Promulgation of Information

23. This section provides information on the proposed approach to the distribution and issuing of NtMs, and other appropriate notifications to the relevant stakeholders and other marine users.

4.1 Notice to Mariners

24. NtMs will be issued in advance of any activity associated with the proposed development which may impact upon navigational safety. The Developer will liaise with the Department of Transport who may issue the NtM via their website as Marine Notices as detailed in Section 4.2. The marine coordinator will then issue the NtM to a list of relevant and national stakeholders. This marine stakeholder list will be regularly updated to ensure contact details remain up to date and all relevant parties are included.

25. The NtM will be concise, detailing navigational safety information and will include the information set out in Table 4.1, which is as per the Department of Transport guidance on the Required Information for the Issue of Marine Notices (Department for Transport, 2023).

Table 4.1 Content of NtM/ Marine Notice

Type of Activity	Type of activity being undertaken, e.g., subsea survey, deployment of buoy, etc.
Duration of Activity	Starting date and approximate finishing date for operations. Marine Notices will usually state that dates given are weather dependant.
Location	Coordinates that follow the conventional method of maritime positions, using World Geodetic System 1984 (WGS84), where latitude is given before longitude.
Vessels Involved	Name of vessel, type of vessel and call sign of vessel.
Safety Precautions Taken	e.g., buoys or markers to highlight area of activity, radio transmissions to notify other seafarers (i.e. VHF channel), etc.
If Buoys are Used	Information on the type/ colour of buoy and the colour and flashing sequence of any lights attached must be included.
Diagrams and/ or Maps	Will also be included. Will show extract(s) from an up-to-date Admiralty Chart.

26. Any vessels used in operations will be appropriately licensed and have the requisite Certificates, e.g., Irish Load Line Cert, in place beforehand. Issuance of a Marine Notice does not grant permission for works or operations to commence. The

required permissions/ licences/ certificates will be obtained in advance from the relevant authorities e.g., Maritime Usage Licence, license to dive/ survey etc.

4.1.1 NtM Issued Prior to the Commencement of Construction

27. The Developer will, as soon as practicable prior to the commencement of any construction activities, ensure that the stakeholders are made fully aware of such works through NtM (or any other appropriate means).

4.1.2 NtM upon Commissioning and During O&M

28. The Developer will ensure all parties on the marine stakeholder distribution list are made fully aware of the completion of the construction works and commissioning of the proposed development.

29. The Developer will ensure that relevant stakeholders are informed via NtM of any planned and unplanned maintenance activities that are outside the day-to-day maintenance activities associated with the proposed development.

4.1.3 Post Commissioning

30. The Developer will, upon the commissioning of the proposed development, provide the 'as built' positions and maximum heights of all wind turbine generators (WTG), substations, and any subsea infrastructure to the United Kingdom Hydrographic Office (UKHO) (who produce Ireland's Admiralty Charts) for nautical charting purposes. WTGs will be charted by the UKHO using the WTG tower chart symbol or within the development area chart symbol (as presented in Symbols and Abbreviations used on ADMIRALTY Paper Charts NP5011 (UKHO, 2020)) on charts deemed appropriate in terms of scale.

31. The same information will be provided to the Marine Survey Office (MSO).

4.1.4 Decommissioning

32. The Developer will, as soon as practicable prior to the commencement of any decommissioning activities, ensure that the stakeholders on the marine stakeholder distribution list are made fully aware of such works through NtMs and other appropriate means such as newsletters and harbour notices. Stakeholders will also be made aware following completion of decommissioning.

4.2 Marine Notices

33. Marine Notices are issued by the Department of Transport, and are intended to publicise important safety, regulatory and other information relating to the maritime sector in Ireland. The Department for Transport will be included on the marine stakeholder distribution list (see Section 4.1) and will therefore be provided with NtMs issued by the Developer. The Department of Transport may choose to publish key information provided in the NtM as Marine Notices.

4.3 Fishing Vessels

34. The approach to promulgation of information to fishing vessels is set out in the Fisheries Management and Mitigation Strategy (Volume 9, Appendix 16.2).

4.4 Radio Navigational Warnings

35. Radio navigational warnings may be issued if an activity or incident poses a danger to other marine users. Examples of when radio navigational warnings could be issued are:

- Failures to light signals, fog signals, buoys, or other aid to navigation (AtoN);
- Establishing new AtoN;
- Cable laying and burial activities, where a risk is posed to passing traffic; including exposed cable on the seabed.
- Other underwater operations that may constitute potential dangers in or near shipping lanes; and/ or
- Vessels not under command or undertaking significant RAM operations.

36. In the context of radio navigational warnings, the UKHO act as the Navigation Area (NAVAREA) 1 (NEW Atlantic) Coordinator of the IMO and International Hydrographic Organization (IHO) Worldwide Navigational Warning Service. However, IRCG are the body responsible for broadcasting the warnings.

4.5 Incident Reporting

37. As required under the Merchant Shipping (Investigation of Marine Casualties) Act, 2000, any marine incidents/ casualties shall be reported to the MSO as soon as is practicable following the occurrence. Following the initial report any relevant details of the incident requested by the Marine Casualty Investigation Board (MCIB) will be provided.

5 Vessel Movements

38. Vessels to be used during the construction, O&M phase and decommissioning of the proposed development cannot be precisely determined at this stage. However, this section provides indicative details of the vessel types that could be used during each phase, and how many vessel movements could be expected for each of those types.

5.1 Construction Phase

39. Table 5.1 summarises the maximum number of vessels and return trips for each construction activity. These numbers have been defined for assessment purposes within the EIAR with further detail provided in **Volume 2, Chapter 6: Description of the Proposed Development – Offshore**.

Table 5.1 Maximum Vessel Numbers per Construction Activity

Construction Activity	Maximum Number of Vessels	Maximum Number of Return Trips
Guard vessels	11	666
Foundation installation	10	337
WTG installation	10	660
WTG commissioning works	8	570
Offshore substation installation	6	556
Export cable installation	18	83
Inter-array cable installation	4	136
Total	**67**	**3,008**

5.2 O&M Phase

40. Table 5.2 summarises the maximum number of vessels and return trips per year for each vessel type. Again, these numbers have been defined for assessment purposes within the EIAR with further details provided in **Volume 2, Chapter 6 Description of the Proposed Development – Offshore**.

Table 5.2 Maximum Vessel Numbers per O&M Activity

Vessel Type	Maximum Number of Vessels	Maximum Number of Annual Return Trips
Crew Transfer Vessels (CTV)/ workboats	1	920
Jack-Up Vessels (JUV)	1	10

Vessel Type	Maximum Number of Vessels	Maximum Number of Annual Return Trips
Cable repair vessels	1	1
Service Operation Vessels (SOV)	1	44
Lift vessel	1	6
Auxiliary vessel	7	280
Total	**12**	**1,261**

5.3 Decommissioning Phase

41. Vessel movements per year during the decommissioning phase will closely resemble those during construction in terms of vessel type and numbers (see Section 5.1).

6 Project Vessel Routeing

42. It is intended that indicative transit corridor routes will be defined in advance of the construction phase to provide an indication of the areas which project vessels may utilise for navigation. However, requirements for proposed development vessels to comply with COLREGs (IMO, 1972/77) shall remain the key navigational priority at all times. On this basis it should be noted that these indicative routes will not be intended to be prescriptive for the purposes of navigation and will not be followed precisely by every proposed development vessel. All vessels shall passage plan as per the International Regulations for the Safety of Life at Sea (SOLAS) (IMO, 1974).

43. Project vessels may deviate from these indicative routes for a variety of reasons at the discretion of the vessel's Master, for example due to:

- Compliance with COLREGs (IMO, 1972/77) or SOLAS (IMO, 1974);
- Prevailing weather, tidal or sea state conditions;
- Navigational hazards as indicated on charts or notified through a NtM or other such sources;
- Due to the vessel originating from or being bound for a destination not indicated by the transit routes;
- Advice from the marine coordinator or other responsible persons in charge of coordinating and managing construction vessel traffic; and
- Such other reasons as the Master of a vessel may deem relevant for the purposes of ensuring the safety of his vessel or another vessel.

44. Consultation will be undertaken with the MSO with respect to if, how and where the routes will be implemented.

7 Anchoring

7.1 Anchorage Areas

7.1.1 Project Vessel Anchoring

45. Anchoring is at the discretion of the vessel Master but can be in conjunction with the information provided by the marine coordinator or port authorities where relevant. However, standard marine practice requires that when a vessel proceeds to anchor, consideration is given to:

- Water depth;
- Seabed type and charted hazards including cables/ pipelines;
- Weather and tidal information including current and predicted weather;
- Avoidance of prohibited anchorage areas;
- Consideration of other anchored vessels;
- Avoidance of known areas of other marine activity such as fishing or recreational boating; and
- Avoidance of main commercial routes, pilot boarding areas or other navigational features such as spoil grounds or subsea cables.

46. All project vessels will take the above into consideration prior to anchoring as per standard marine practice. Where a project vessel requires anchorage within the array area permission will be requested from the marine coordinator.

7.1.2 Summary of NRA Findings

47. The NRA includes assessment of charted anchorage areas and preferred anchorages. A charted anchorage is located approximately 6nm to the west of the array area, at Drogheda Port. Assessment of AIS data undertaken in the NRA (**Volume 9, Appendix 17.1: Navigational Risk Assessment**) shows that a small volume of anchoring activity also occurs around Skerries Bay and Port Oriel, close to shore. Further afield, there is also a charted anchorage associated with Dublin Port in Dublin Bay.

48. These areas are shown in Figure 7.1, alongside smaller ports and harbours. It is noted that these are not necessarily areas that project vessels will use for anchoring, and the factors listed in Section 7.1.1 will be considered by every project vessel prior to planned anchoring.

7.1.3 Areas to avoid when Anchoring

49. There is no charted information to indicate that anchoring is prohibited in any areas within the vicinity of the array area. The closest such area identified is on approach to Dublin Bay, in excess of 16nm to the south, at Burford Bank. Project vessels will not use any such area for anchoring, noting that the factors listed in Section 7.1.1 will also all be considered.

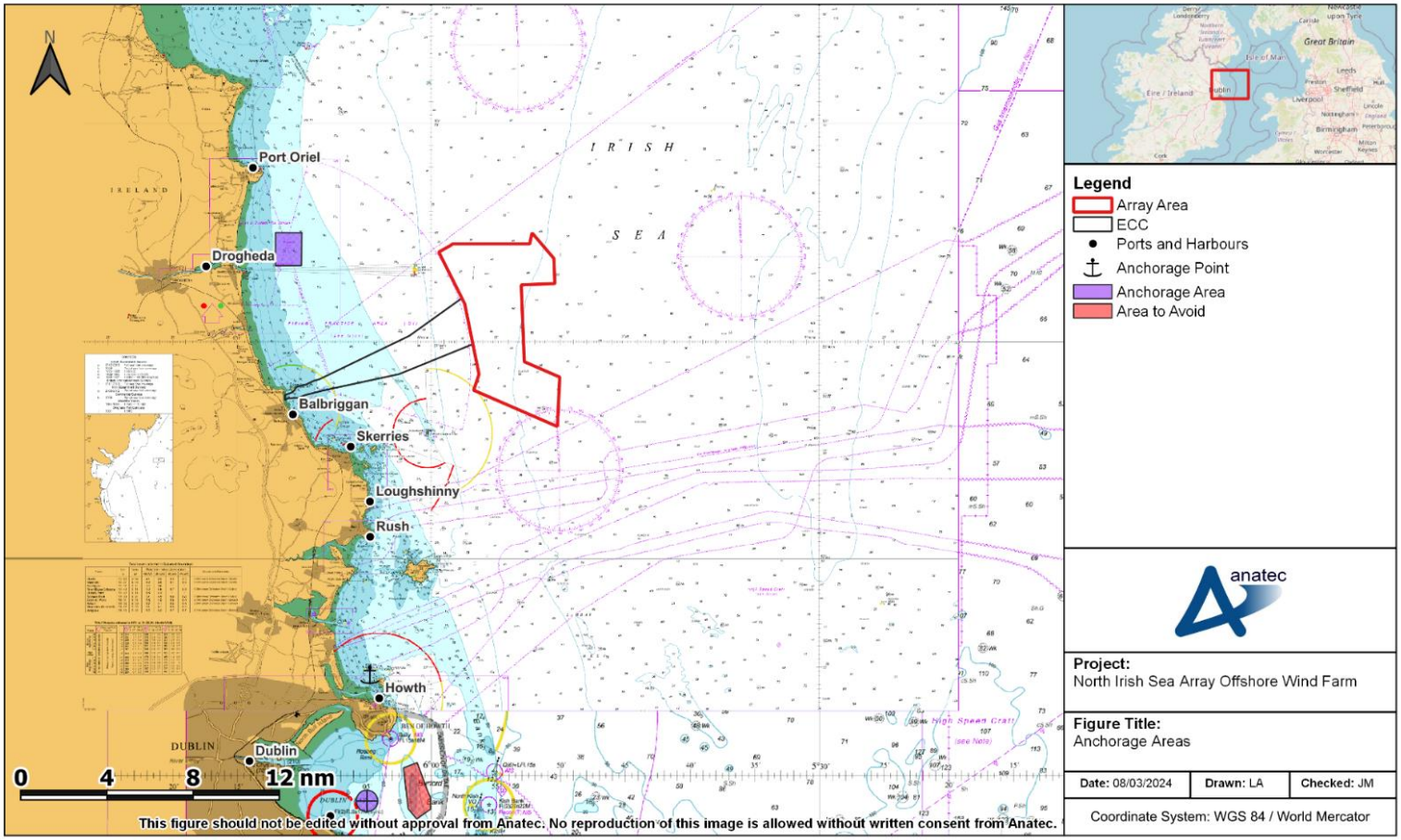

Figure 7.1 Anchorage Areas

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