Buchan Offshore Wind

Chapter 13 Shipping and Navigation

QMS Review

Name	Company	Date	Reviewed	Approved
NASH Maritime	Natural Power	18/06/2025	LJN	SMM
RML	Buchan Offshore Wind	20/06/2025	RML	ISS

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13.1 INTRODUCTION

13-1. This chapter forms part of the Environmental Impact Assessment Report (EIAR) for the Proposed Offshore Development. 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 impacts resulting from the Proposed Offshore Development, as required by the EIA Regulations.

13-2. This EIAR chapter describes the likely significant effects of the Proposed Offshore Development's Offshore Generation and Transmission Infrastructure on shipping and navigation during the construction, operation and maintenance and decommissioning phases and discusses appropriate mitigation and monitoring as required to address any adverse likely significant effects.

13-3. Section 13.15 of this EIAR chapter provides a summary of the impact assessment and confirms the likely significance of residual effects on shipping and navigation after mitigation and/or monitoring measures have been considered.

13-4. The assessment should be read in conjunction with the following linked and supporting chapters of the EIAR:

- **Volume 2, Chapter 11: Commercial Fisheries;**
- **Volume 2, Chapter 12: Infrastructure and Other Marine Users;**
- **Volume 2, Chapter 15: Military and Civil Aviation;**
- **Volume 2, Chapter 17: Socioeconomics, Tourism and Recreation**.

13-5. Additional information to support the assessment includes:

- **Volume 3, Appendix 13.1: Navigation Risk Assessment (NRA**);
- Proposed Management Plan (PMP) 3: Proposed Navigational Safety and Vessel Traffic Management Plan;
- PMP 4: Proposed Aids to Navigation (AtoN) Management Plan;
- PMP 5: Proposed Lighting and Marking Plan.

13.2 PURPOSE OF THIS CHAPTER

13-6. The primary purpose of the EIAR is defined in **Volume 1, Chapter 1: Introduction**.

13-7. It is intended that the EIAR will provide Scottish Ministers, statutory and non-statutory stakeholders with sufficient information required to determine the impacts of the Proposed Offshore Development associated with the construction, operation and maintenance and decommissioning phases on the receiving environment, and to assess the likely significant effects arising from those impacts.

13-8. The objectives of this chapter are to:

- Define legislation, guidance, and policy documents relevant to shipping and navigation;
- Provide an overview of consultation activities and present the responses relevant to shipping and navigation;

- Present the methodology and significance criteria used in the impact assessment and provide definitions of the scope of the Study Area;
- Define the shipping and navigation existing environment;
- Describe the likely significant effects that activities associated with any stage of the Proposed Offshore Development may have on shipping and navigation from direct, indirect, and cumulative sources and assess the likely significant effects arising from those impacts; and
- Describe any potential transboundary impacts and inter-relationships on shipping and navigation.

13-9. Quantitative modelling of the likelihood of collision and allision for vessels navigating within the Study Area using the IALA Waterway Risk Assessment Programme (IWRAP) tool was conducted in support of this shipping and navigation assessment and the results have been presented in **Volume 3, Appendix 13.1 NRA** of this EIAR.

13.3 LEGISLATION, POLICY AND GUIDANCE

13-10. A summary of legislation, policy, and guidance documents directly relevant to shipping and navigation is presented in the following sections and have been referred to as appropriate in the characterisation of the baseline and the impact assessment. Overarching information in relation to the legal framework for the Proposed Offshore Development is provided in **Volume 1, Chapter 2: Legislation and Policy** of the EIAR.

13.3.1 Legislation

13-11. All legislation directly applicable to shipping and navigation is illustrated in **Table 13-1**.

Table 13-1 Legislation Relevant to Shipping and Navigation

Legislation	Summary	Relevance to this Chapter
United Nations Convention on the Law of the Sea (UNCLOS) (UN, 1982)	UNCLOS is an international agreement that establishes a legal framework for all marine and maritime activities. Article 60(7) states that "Artificial islands, installations and structures and the safety zones around them may not be established where interference may be caused to the use of recognised sea lanes essential to international navigation." As per Article 22(4), "The coastal state shall clearly indicate such sea lanes and traffic separation schemes on charts to which due publicity shall be given".	Any traffic routeing schemes in the area have been considered in **Section 5 of Volume 3, Appendix 13.1: NRA.**
Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) (IMO, 1972/77)	A set of regulations which establish the conduct of vessels in any condition of visibility, and the correct actions to take when a vessel is in close quarters with another vessel. Rule 8 Part (a) states that "Any action taken to avoid collision shall be taken in accordance with the Rules of the Part and shall, if the circumstances of the case admit, be positive,	Collision risks and avoidance provisions are considered and assessed in **Section 8.3 of Volume 3, Appendix 13.1: NRA**.

Legislation	Summary	Relevance to this Chapter
	made in ample time and with due regard to the observance of good seamanship." Similarly, Rule 19 Part (b) states that "Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre".	
International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974) [incorporated through the Merchant Shipping (Safety of Navigation) Regulations 2020.]	An international maritime treaty that concerns the safety of merchant ships. Regulation 33 states that "The master of a ship at sea which is in a position to be able to provide assistance on receiving information from any source that persons are in distress at sea, is bound to proceed with all speed to their assistance". This is followed by Regulation 34, which states that "Prior to proceeding to sea, the master shall ensure that the intended voyage has been planned using the appropriate nautical charts and nautical publications for the area concerned."	The shipping and navigation assessment undertaken in this chapter and within **Volume 3, Appendix 13.1: NRA** has been based on the appropriate nautical charts and nautical publications for the area concerned: • Admiralty Chart 0115 • Admiralty Chart 1942 • Admiralty Chart 0291 • Admiralty Chart 1409 • NP52: North Coast of Scotland Pilot Admiralty Sailing Directions.

13.3.2 Policy

13-12. All policy directly applicable to shipping and navigation is illustrated in **Table 13-2**.

Table 13-2 Policy Relevant to Shipping and Navigation

Policy	Summary	Relevance to this Chapter
United Kingdom (UK) Marine Policy Statement, His Majesty's (HM) Government, 2011)	Paragraph 3.4.7 states that: "Increased competition for marine resources may affect the sea space available for the safe navigation of ships. Marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law. Marine Plan development and individual decisions should also take account of environmental, social and	Where relevant, the impacts to vessel traffic and routeing have been considered in **Sections 8.2** and **8.16** of **Volume 3, Appendix 13.1:** NRA and within **Sections 13.11.1.2, 13.11.2.2** and **13.11.3.2** of this chapter.

Policy	Summary	Relevance to this Chapter
	economic effects and be in compliance with international maritime law. Marine plan authorities will also need to take account of the need to protect the efficiency and resilience of continuing port operations, as well as further port development."	
Scotland's National Marine Plan (NMP) (Scottish Government, 2015)	Transport 1: "Navigational safety in relevant areas used by shipping now and in the future will be protected, adhering to the rights of innocent passage and freedom of navigation contained in UNCLOS…"	Impacts to passenger and commercial vessel traffic, routeing (where relevant) during Proposed Offshore Development construction, operation & maintenance and decommissioning have been assessed in **Sections 13.11.1.2, 13.11.2.2** and **13.11.3.2**, respectively. Impacts to commercial fishing activity and routeing are considered in **Sections 13.11.1.11, 13.11.2.11**, and **13.11.3.11**. Impacts to recreational vessels and routeing are considered in Sections 13.11.1.12, 13.11.2.12, and 13.11.3.12 Impacts on access to ports (where relevant) have been considered in **Sections 13.11.1.10**, **13.11.2.10**, and **13.11.3.10**. Embedded mitigations are detailed in **Table 13-15**, with additional mitigation identified as needed under the Formal Safety Approach (FSA) in the relevant impact section of this chapter and **Section 9.6 of Volume 3, Appendix 13.1: NRA**. A future case traffic profile is considered in **Section 13.7.3** and **Section 7 of Volume 3, Appendix 13.1: NRA**.
	Transport 2: "Marine development and use should not be permitted where it will restrict access to, or future expansion of, major commercial ports or existing or proposed ports and harbours which are identified as National Developments in the current NPF or as priorities in the National Renewables Infrastructure Plan (Map 10 and 11).."	
	Transport 3: "Ferry routes and maritime transport to island and remote mainland areas provide essential connections and should be safeguarded from inappropriate marine development and use that would significantly interfere with their operation. Developments will not be consented where they will unacceptably interfere with lifeline ferry services."	
	Transport 6: "Marine planners and decision makers and developers should ensure displacement of shipping is avoided where possible to mitigate against potential	

Policy	Summary	Relevance to this Chapter
	increased journey lengths (and associated fuel costs, emissions and impact on journey frequency) and likely significant effects on other users and ecologically sensitive areas."	

13.3.3 Guidance

13-13. The principal guidance document for NRAs is the Maritime and Coastguard Agency (MCA)'s Marine Guidance Note (MGN)654 (2021). MGN654 describes the potential shipping and navigation issues which should be considered by developers when proposing offshore renewable energy installations (OREIs). Annex 1 (2021) of the MGN provides a detailed methodology for assessing the marine navigational safety risks of OREIs.

13-14. The International Maritime Organisation (IMO)'s Formal Safety Assessment process has been applied within **Volume 3, Appendix 13.1: NRA**. The guidelines for FSA were approved in 2002 and were most recently amended in 2018 by MSC-MEPC.2/Circ.12/Rev.2 (IMO, 2018). The FSA is a structured and systematic methodology, aimed at enhancing maritime safety, including protection of life, health, the marine environment and property, by using risk analysis and, if appropriate, cost-benefit assessment. The IMO FSA guidance defines a hazard as "a potential to threaten human life, health, property or the environment", the realisation of which results in an incident or accident. The potential for a hazard to be realised (i.e. likelihood) can be combined with an estimated or known consequence of outcome and this combination is termed "risk".

13-15. MGN372 Amendment 1 Safety of Navigation: Guidance to Mariners Operating in Vicinity of UK OREIs. (MCA, 2022) provides guidance to support passage planning near offshore renewable energy installations off the UK coast.

13-16. The International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) G1162 The Marking of Offshore Man-Made Structures (IALA, 2021) provides guidance on the lighting and marking arrangements for Offshore Wind Farms (OWFs).

13-17. The RYA Position of Offshore Renewable Energy Developments: Wind Energy (RYA, 2019) describes the key impacts of OWFs on recreational activities.

13-18. PIANC WG161 Interaction Between Offshore Windfarms and Maritime Navigation (PIANC, 2018) provides guidelines and recommendations on impacts on mitigations for shipping routes near OWFs.

13-19. Nautical Institute (2013) The Shipping Industry and Marine Spatial Planning provides guidance on benefits and risks of marine spatial planning for shipping and navigation.

13-20. G+ Integrated Offshore Emergency Response (IOER) (2019) Good practice guidelines for offshore renewable energy developments provides guidance on emergency response for OWFs.

13-21. Health and Safety Executive (HSE) and MCA (2017). Regulatory expectations on moorings for floating wind and marine devices provides guidance on foundations and mooring arrangements for floating wind and marine devices.

13.4 CONSULTATION

13-22. Buchan Offshore Wind Ltd (The Applicant) has sought opinion and advice from key stakeholders through scoping and consultation regarding the EIA Scoping Report for the Proposed Offshore Development (SCOP - 0031) (which was submitted to MD-LOT in October 2023).

13-23. **Table 13-3** provides a summary of the key issues raised during the consultation process relevant to shipping and navigation and details of how these issues have been considered in the production of this EIAR Chapter.

13-24. Further detail on the Proposed Offshore Development 's overall EIA stakeholder consultation process is presented in **Volume 1, Chapter 5: EIA Methodology** of the EIAR.

Table 13-3 Consultation Relevant to Shipping and Navigation

Consultee	Date	Summary / Issues Raised	Applicant Response
Scoping Consultation			
MCA and Northern Lighthouse Board (NLB)	6 October 2020	•The shipping and navigation assessments that were undertaken for the array area were presented; •The methodology used, constraint scorings and mitigation potential was presented and discussed; •The combined effect on ship routeing due to the presence of the ScotWind sites was raised and discussed; •The application of standard mitigations relating to lighting and marking proposed for the site were agreed.	The Applicant has considered the advice as part of the bid phase and ScotWind Leasing process, and in the early stages of the EIA. The cumulative scenario has been considered in the Cumulative Effects Assessment (**Section 13.12**).
MCA and NLB	1 November 2022	•The Proposed Offshore Development was introduced providing an overview of the marine aspects and expected timelines; •A recap was provided of the previous work undertaken (during the leasing stage) identifying shipping and navigation constraints for the site; •A summary of the datasets used during the leasing stage was provided; •Considerations of the deployment of a Floating Light Detection and Ranging (FLiDAR) buoy and site investigation works were discussed along with requirements from the MCA and NLB; •Vessel traffic survey requirements and timings/seasonality were agreed for the array area and potential IRC platform;	The Applicant implemented the advice received from consultees, including the development of the EIA baseline and data collection strategy.
MCA and NLB	July – November 2022	•The MCA and NLB were contacted regarding mitigation requirements for a FLiDAR buoy and site investigation and whether they considered either operation to be a hazard to navigation; •A range of mitigation measures including promulgation of information were provided and both the MCA and NLB confirmed that they did not consider the operations to be a hazard to navigation. Statutory sanctions were also issued by the NLB for the campaign.	The Applicant deployed the FLiDAR buoy and commenced the site investigation campaign.
MCA, NLB, Scottish Whitefish Producers Association (SWFPA), Marine Scotland	15 May 2023	•A baseline description of the shipping and navigation environment was presented including, vessel traffic by category; •A list of the likely significant effects was presented with consultees agreeing that there were no further anticipated impacts beyond those shared; •The potential for small movements of the floating structures was discussed with regards to potential effects on vessel activity along with search and rescue (SAR). It was considered that the topic should be revisited for vessel activity once there is more information available on the proposed mooring system and design; •The approach to scoping and data sources to be used was discussed and agreed; •The vessel traffic survey and other data sources to be used for the NRA was discussed with the use of a full year of AIS data for the Array Area and Export Cable Corridor (ECC) being considered; •It was recommended to engage with the local ferry operators at an early stage.	The Applicant noted the advice and included this within the approach to EIA, by considering small movements of floating structures within this chapter (**Section 13.11.2.14**) and using a full year of AIS data for the entire Shipping and Navigation Study Area within the **Volume 3, Appendix 13.1: NRA**. Furthermore, engagement commenced with ferry operators as advised in the workshop.

Consultee	Date	Summary / Issues Raised	Applicant Response
Scoping Opinion (SCOP 0031)			
Northern Lighthouse Board	05 October 2023	•Cumulative impacts of IRC platforms to be assessed.	•Cumulative impacts are assessed **in Section 13.12** •The impact on risk of allision is assessed in **Sections 13.11.1.3, 13.11.2.3** and **13.11.3.3**.
RYA Scotland	11 October 2023	•Limitations of AIS Data for small craft; •Risk of failure of AtoNs to be assessed; •Opposition to any wider safety zone than is currently the industry standard.	The AIS data was supplemented with a vessel traffic survey using visual and radar observations (**Section 13.6.2**), as well as secondary sources (such as the RYA Coastal Atlas) and consultation to complete the picture of small craft vessel movements. Failure of AtoNs is considered as a cause of an allision event, which is discussed in **Sections 13.11.1.3, 13.11.2.3** and **13.11.3.3**. Safety zones proposed as part of the Proposed Offshore Development have accounted for both consultation feedback and best practice (EM19 in **Table 13-15**).
UK Chamber of Shipping	26 October 2023	•Cumulative impacts Study Area to be increased to 50 nm; •Loss of station of WTGs risk to be scoped into O&M phase of assessment; •Impact of wet storage/marshalling areas to be scoped into the O&M and Decommissioning phases of the assessment.	•Cumulative impacts are assessed in **Section 13.12**. •Impact of WTG Breakout is considered for all phases of the assessment in **Sections 13.11.1.13, 13.11.2.13** and **13.11.3.13** given the ability for installed WTG moorings to fail during any stage of the Proposed Offshore Development . •Details on the O&M activities for the Proposed Offshore Development are not fully developed, so have not been fully considered within this assessment. However, once the O&M ports are confirmed, the Project will be required to meet the requirements of each port in terms of navigation safety assessment usually in the form of a specific and separate NRA. •It is expected that the relevant consents, permits, or licences, for the wet storage of floating foundations and fully integrated units will be the responsibility of the relevant port authority or party responsible for the provision of wet storage. Should this position change, a separate licence application and supporting study will be submitted by the Applicant. Wet storage is therefore not part of this application and will be assessed outside this EIAR once details are known. More information is provided in **Section 4.7.10 of Volume 3, Chapter 4: Project Description**..
MCA	2 November 2023	•Assessment approach MGN654 compliance; •Impact on Collision Risk; •Impact on Navigational Safety; •Visual intrusion and noise; •Risk Management and Emergency response; •Marking and lighting of site and information to mariners; •Effect on small craft navigational and communication equipment; •The risk to drifting recreational craft in adverse weather or tidal conditions; •The likely squeeze of small craft into the routes of larger commercial vessels; •Impacts on vessel routeing and adverse weather routeing; •Cumulative impacts to be assessed ; •WTG layouts to comply with MGN654 ; •Cabling routes marking and protection; •Effects of electromagnetic deviation on ships compasses to be considered.	•MGN654 compliance. •Impact on Collision Risk is considered and assessed in **Section 13.11.2.3** and **Section 13.11.2.4** . •Impact on Navigational Safety. •Effects on visual intrusion and noise are considered in **Sections 13.11.1.8 ,** and **Section 13.11.1.4**. •Impact on Risk Management and Emergency response is considered in **Sections 13.11.1.7, 13.11.2.7**, and **13.11.3.7**. •Marking and lighting of site is outlined in PMP 5: Proposed LMP. •Promulgation of information via NtMs is included as an embedded mitigation in **Table 13-15.** •The risk to small craft is assessed in **Sections 13.11.1.11, 13.11.1.12, 13.11.2.11, 13.11.2.12, 13.11.3.11**, and **13.11.3.12**. •Typical and Adverse Vessel routeing is considered in **Sections 13.11.1.2, 13.11.2.2, and 13.11.3.2**. •Cumulative impacts are assessed in **Section 13.12**.

Consultee	Date	Summary / Issues Raised	Applicant Response
			•Export Cable marking and protection is considered as an embedded mitigation measure within **Table 13-15**. •Effects of electromagnetic deviation on ships compasses is considered in **Sections 13.11.1.8, 13.11.2.8 and 13.11.3.8**.
NorthLink Ferries	15 November 2023	•Distance of IRC platform from standard routes to be assessed.	•Impact on NorthLink vessel route is considered in **Sections 13.11.1.2, 13.11.2.2, and 13.11.3.2**. •Impact on the risk of allision with the IRC Platform is considered within **Sections 13.11.1.3, 13.11.2.3, and 13.11.3.3**. •The Proposed Offshore Development has committed to a minimum 2 nm separation as discussed in **Section 13.11.1.2.**
Other Relevant Consultation To Date			
NorthLink Ferries	03 September 2024	•Adverse weather routeing to be considered; •Cumulative impacts (particularly of IRCs) to be assessed.	•Cumulative impacts are assessed in **Section 13.12**. •Vessel routeing is considered in **Sections 13.11.1.2, 13.11.2.2, and 13.11.3.2**.
Northern Lighthouse Board	04 September 2024	•Cumulative impacts (particularly of IRCs) to be assessed; •Maintenance activity risk to be considered. •WTG foundation shape to be considered for lighting and marking; •Manning of IRC platform to be considered for lighting and marking; •Potential for additional proposed offshore development buoyage to increase allision risk.	•Cumulative impacts are assessed in **Section 13.12**. •Impact of Towage for WTG Maintenance is assessed in **Sections 13.11.1.6, 13.11.2.6, and 13.11.3.6**. •A Lighting and Marking Plan (LMP) will be produced in agreement with NLB and MCA prior to construction (see PMP 5: Proposed LMP). •Risk of allision is assessed in **Sections 13.11.1.3, 13.11.2.3, and 13.11.3.3**.
RYA Scotland	04 September 2024	•Breakout of (metocean) buoys should be considered; •Time lag between chart updates should be considered as this makes promulgation of information ineffective; •Indicated that an objection to a larger safety zone than usual for wind farms (50 m and 500 m) may arise.	•Other risk controls have been considered alongside the promulgation of information which help mitigate the risks to recreational vessels (**Table 13-15**). •The potential for a breakout of buoyage has been considered as a cause for hazards involving allision with a WTG during the construction phase. •500 m safety zones are proposed and have been assessed around construction, which is common across the industry. The Applicant intends to apply for standard safety zones of 500m during construction or during periods of heavy maintenance.
Scottish Pelagic Fishermen's Association	09 September 2024	•Full and partial breakout of WTGs should be considered; •Concern for floating, unmarked buoys as an additional mitigation.	•WTG breakout is considered within in **Sections 13.11.1.13, 13.11.2.13, and 13.11.3.13**. •Permanent site buoyage has not been recommended as an additional risk control.
MCA	09 September 2024	•Further consultation required to discuss construction buoyage; •Cumulative impacts to be assessed.	•A Lighting and Marking Plan (LMP) and AtoN Management Plan will be produced in agreement with NLB and MCA prior to construction (see PMP 3: Proposed LMP, and PMP 4: Proposed AtoN Management Plan). •Cumulative impacts are assessed in **Section 13.12**.
NorthLink Ferries, Northern Lighthouse Board, RYA Scotland, Scottish Pelagic Fishermen's Association, MCA (HAZID Workshop)	24 September 2024	•The risk of a sinking hull/WTG in addition to WTG breakout should be considered; •There is an expectation that operators can tow WTGs to safety in the event of a breakout; •The risk to emergency response should be considered.	•The NRA (**Section 8.14**) considers a breakout as a WTG or hull/foundation losing position. •Given that emergency towage is not likely to have a cost-benefit, the establishment of a forum for regional developers has been recommended as an additional risk control (**Section 9.6.1 of the NRA**) to enable discussions around the potential for resources (including tugs) to be shared in the event of additional towage requirements. •The potential impact to SAR is considered within **Sections 13.11.1.7, 13.11.2.7, and 13.11.3.7.**

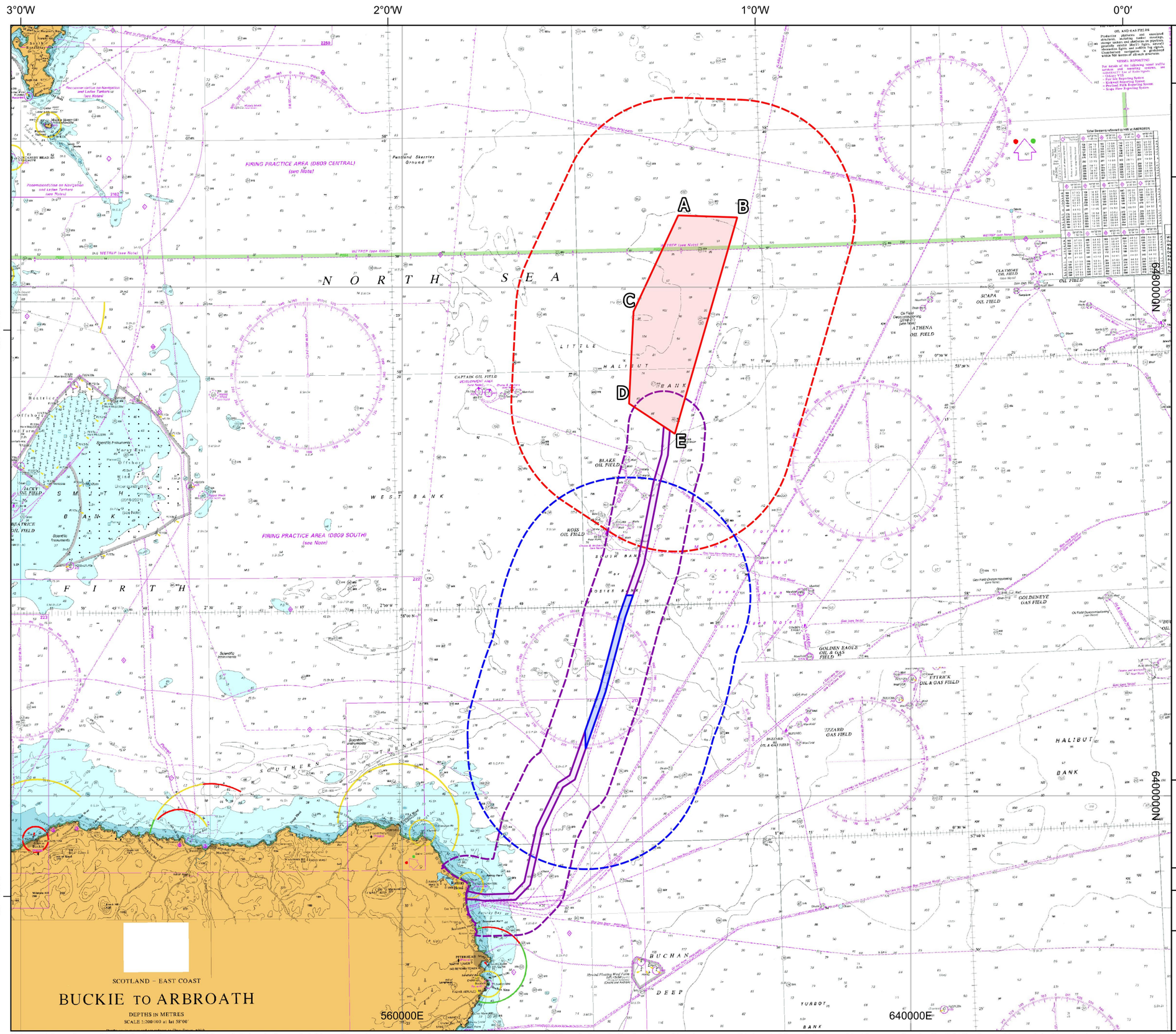
13.5 STUDY AREA

13-25. The Shipping and Navigation Study Area (hereon referred to as the 'Study Area') is shown in **Figure 13-1** and comprises the following:

- Proposed Offshore Development array area (hereon referred to as the 'Array Area') and its 10 nm Buffer (referred to as the 'Array Study Area';
- Export Cable Corridor (ECC) and a 3 nm Buffer (referred to as the 'ECC Study Area'); and
- Indicative IRC Area and a 10 nm Buffer (referred to as the 'IRC Study Area').

13-26. This Study Area is consistent with industry best practice as it provides further context to vessel traffic and routeing in proximity to the Proposed Offshore Development and allows for identification of key navigational features affecting vessel traffic. It is recognised that the vessel traffic routeing through the Study Area will be affected by navigational features located outside of the Study Area, for example ports and channels such as the Pentland Firth. Where features are contextually relevant or affect routeing through, but are located outside of the Study Area, they will be highlighted and described.

13-27. The Array Area is an area of up to 330 km^2 around 75 km north-east of Fraserburgh, of 73-110 m water depths. The ECC is approximately 86 $km^2$and joins the Array Area to the Aberdeenshire coast, making landfall within Rattray Bay, north of the St Fergus Gas Terminal. The exact IRC Platform location has not yet been confirmed, but an Indicative IRC Area has been provided and sits in the middle of the ECC as shown in **Figure 13-1.**



Project:

Buchan Offshore Wind EIA

Title:

Figure 13-1: Project Overview

Key

- Array Area
- Array Study Area (10 nm)
- Indicative IRC Area
- IRC Study Area (10 nm)
- Export Cable Corridor (ECC)
- ECC Study Area (3 nm)

Charts: 0115-0, 1942-0, 0291-0, 0278-0 and 1409-0.

Scale @ A3:1:600,000

Coordinate System: WGS 84 UTM Zone 30N
Graticules: WGS84

0 7 14 21 28 km

N

Date: 08-07-25	Prepared by: MP	Checked by: ES

EIA Ref No: BUC-C-MP-NP-0147
Map Ref: 0223_Project_Overview_R02

BUCHAN OFFSHORE WIND

13.6 METHODOLOGY TO INFORM BASELINE ENVIRONMENT

13-28. Baseline data to inform the shipping and navigation assessment was collected using the following methods.

13.6.1 Desktop Study

13-29. Information on shipping and navigation within the Study Area was collated through a detailed desk-based review of existing studies and datasets which are summarised in **Table 13-4**.

13-30. Further detail of analysis undertaken using the data and how it was used to assess impacts to shipping and navigation is contained within **Volume 3, Appendix 13.1: NRA.**

Table 13-4 Key Sources of Shipping and Navigation Literature and Data

Literature/Data	Source	Year	Author
High Fidelity AIS Data	Made Smart Group	Jan 2023 – Dec 2023	N/A
Vessel Density Grid	European marine Observation and Data Network (EMODNet)	2023	N/A
Recreational Boating Intensity	Royal Yachting Association (RYA) Coastal Atlas	2023	Royal Yachting Association (RYA) Coastal Atlas
Average Annual Fishing Effort	EMODNet - Human Activities, STECF, and the FAO	2023	EMODNet - Human Activities, STECF, and the FAO
Shipping Statistics	Department for Transport (DfT, 2023)	Up to 2023	Department for Transport (DfT)
Recorded Incidents	Marine Accident Investigation Branch (MAIB) Accident Database Royal National Lifeboat Institute (RNLI) Incident Database	1992-2022 2008-2023	MAIBAccident Database Royal National Lifeboat Institute (RNLI) Incident Database
Marine Aggregate Dredging Licenses	The Crown Estate	2024	The Crown Estate
Offshore Renewables	The Crown Estate	2024	The Crown Estate
Oil and Gas Activity	Oil and Gas Authority, North Sea Transition Authority	2023	Oil and Gas Authority, North Sea Transition Authority
Met Ocean Data	Copernicus Marine Data Store	2023	Copernicus Marine Data Store
Investigation of Technical and Operational Effects on Marine Radar Close to Kentish Flats Offshore Windfarm.	British Wind Energy Association (now Renewable UK)	2007	British Wind Energy Association (now Renewable UK)

Literature/Data	Source	Year	Author
IWRAP Collision and Allision Modelling	IWRAP MK II: Basic Modelling Principles for Prediction of Collision and Grounding Frequencies.	2008	Friis-Hansen, P
Regulatory expectations on moorings for floating wind and marine devices	HSE / MCA	2017	HSE / MCA
Formal Safety Assessment MSC-MEPC.2/Circ.12/Rev. 2	IMO	2018	IMO
Results of the electromagnetic investigations and assessments of marine radar, communications and positioning systems undertaken at the North Hoyle windfarm by QinetiQ and the MCA.	MCA and QinetiQ	2004	MCA and QinetiQ
Offshore Windfarm Helicopter SAR Trials Undertaken at the North Hoyle Windfarm.	MCA	2005	MCA
Exercise Sancho Post-Exercise Report	HMCG	2022	W Goldstein
MCA report following aviation trials and exercises in relation to offshore windfarms	MCA	2019	MCA
Wind Turbine Generator Impacts to Marine Vessel Radar.	National Academies	2022	National Academies
The Shipping Industry and Marine Spatial Planning	Nautical Institute	2013	Nautical Institute
WG161: Interaction between Offshore Windfarms and Maritime Navigation.	PIANC	2018	PIANC
Assessing the impacts to vessel traffic from offshore	Scientific Journals of the Maritime University of Szczecin	2015	Rawson, A and Rodgers, E

Literature/Data	Source	Year	Author
windfarms in the Thames Estuary			
Assessing the validity of navigation risk assessments: a study of offshore windfarms in the UK.	Ocean and Coastal Management, 219	2022	Rawson, A and Brito,
Water Sports Participation Surveys	Royal Yachting Association (RYA)	2018 and 2021	Royal Yachting Association (RYA)

13.6.2 Baseline Surveys

13-31. Proposed Offshore Development specific surveys were carried out to collect data to inform assessment of shipping and navigation. These surveys are detailed in **Table 13-5**.

Table 13-5 Proposed Offshore Development Specific Surveys Undertaken to Inform Shipping and Navigation

Survey, Survey Contractor and Year	Summary	Coverage of Proposed Offshore Development Study Area
Vessel Traffic Survey – Array Area, Summer 2023 (01-Aug-23 – 15-Aug-23) and Winter 2023 (17-Nov-23 – 03-Dec-23).	2x14 day vessel traffic surveys (one in summer, one in winter) were conducted from within a 2.5 nm roaming area of the Array Area, in compliance with the requirements under MGN654.	Full Array Study Area
Vessel Traffic Survey – IRC Area, Summer 2023 (16-Aug-23 – 30-Aug-23) and Winter 2023 (03-Nov-23 – 17-Nov-23).	2x14 day vessel traffic surveys (one in summer, one in winter) were conducted from within a 5 nm roaming area within the IRC Search Area, in compliance with the requirements under MGN654.	Full IRC Study Area

13.6.3 Modelling

13-32. The IWRAP Mk II is a quantitative tool for calculating the frequency of collisions, groundings and allisions for vessels navigating a given waterway. The tool was developed by IALA to support coastal states in conducting risk assessments to address obligations under International Convention on the SOLAS Chapter V. The tool has been presented at the IMO (e.g. NAV 52/17/2 and SN.1/Circ.296) and used by Denmark and Sweden to support the assessment of new routeing measures (NCSR 5/INF.3). IALA (2017) Guideline G1123 contains guidance on implementing the tool and the underlying mechanics are presented in Friis-Hansen (2008).

13.7 BASELINE ENVIRONMENT

13-33. A full assessment of the baseline environment for shipping and navigation is provided in **Volume 3, Appendix 13.1: NRA**, including details of navigational features, maritime

incidents, and an assessment of the marine traffic baseline. This section provides a summary of the key findings from the assessment of the baseline environment in the NRA and therefore both documents should be read in parallel. This section is intended to provide an overview of the baseline environment relevant to shipping and navigation and does not provide any additional information over that presented in the NRA. Key features relevant to the Proposed Offshore Development and features relating to the management of vessels and safety of navigation are described in this section.

13.7.1 Description of the Marine Environment

13-34. Key navigational features in proximity to the Proposed Offshore Development and relevant to the management of vessels and safety of navigation are described in this section and shown in **Figure 13-2**. There are no IMO routeing/reporting measures or recommended channels in the Study Area. The Western European Tanker Reporting System (WETREP) boundary crosses the northern portion of the Array Area.

13-35. There are two lighthouses within the Study Area; one at Rattray Head and one at Cairnbulg Point opposite Fraserburgh Harbour. Several buoys are located around the entrances to the ports of Peterhead and Fraserburgh and around the existing Hywind Scotland Floating Wind Farm located just south of the Study Area.

13-36. The port of Peterhead is a commercial port providing services for dry cargo, cruise, energy and the fishing sectors. The largest vessels that can be accommodated at the port are of 280 m length and 10.5 m draught. There is also a large recreational community at Peterhead with the Peterhead Leisure Marina providing pontoon berthing for 150 vessels. The port operates a Vessel Traffic Service (VTS) as defined by MGN 401 Amendment 3 (MCA, 2022) which manages vessel movements and operations within its Statutory Harbour Authority (SHA) area. This encompasses an area of approximately a two-mile radius from the port. The port also requires pilotage for those vessels that meet the requirements laid out in its pilotage directions.

13-37. Fraserburgh Harbour is primarily a busy fishing harbour providing for an extensive local fleet. The harbour is able to handle vessels of up to 92 m length, 16 m beam or 6.2 m draught. The harbour also provides services to the offshore renewables sector being the operations and maintenance (O&M) base for the Moray East OWF. The harbour operates a Local Port Service (LPS) and pilotage service for vessels meeting the requirements of its pilotage directions.

3°0'W
2°0'W
1°0'W
0°0'

58°24'N
57°36'N
560000E
640000E
6480000N

STROMAR WIND FARM
CAPTAIN OIL FIELD
SINCLAIR WIND FARM
SCARABEN WIND FARM
BLAKE OIL FIELD
BROADSHORE WIND FARM
MARRAM WIND FARM
ROSS OIL FIELD
GREEN VOLT WIND FARM
ASPEN WIND FARM
SALAMANDER WIND FARM
FLORA WIND FARM
MUIR MHOR WIND FARM

NORTH SEA
FIRTH
SCOTLAND – EAST COAST
BUCKIE TO ARBROATH
DEPTHS IN METRES
SCALE 1:200 000 at lat 58°00'

Project:
Buchan Offshore Wind EIA

Title:
Figure 13-2: Key Navigational Features

Key

- Array Area
- Array Study Area (10 nm)
- Indicative IRC Area
- IRC Study Area (10 nm)
- Export Cable Corridor (ECC)
- ECC Study Area (3 nm)
- Offshore Oil and Gas Field
- PEXA
- Harbour Area
- Anchorage Area
- Dumping Ground
- INTOG Site
- Scotwind Site

Offshore Wind Site:

- Operational
- Under Construction
- Consented
- In Planning
- Pre-Planning

Scale @ A3:1:600,000

Coordinate System: WGS 84 UTM Zone 30N
Graticules: WGS84

0 7 14 21 28 km

N

Date: 08-07-25	Prepared by: MP	Checked by: ES

EIA Ref No: BUC-C-MP-NP-0148
Map Ref: 0223_Key_Navigational_Features_R02

BUCHAN OFFSHORE WIND

Notes: a) Information on this plan is directly reproduced from digital and other material from different sources. Minor discrepancies may therefore occur. Where further clarification is considered necessary, this is noted through the use of text boxes on the plan itself. b) For the avoidance of doubt and unless otherwise stated: 1.this plan should be used for identification purposes only, unless otherwise stated in accompanying documentation. 2. Buchan Offshore Wind Ltd accepts no responsibility for the accuracy of data supplied by third parties. 3.Buchan Offshore Wind Ltd accepts no liability for any use which is made of this plan by a party other than its client. No third party who gains access to this plan shall have any claim against Buchan Offshore Wind Ltd in respect of its contents.

13-38. The closest operational offshore renewable project to the Study Area is the Hywind Scotland Pilot Park located 8 nm south of the Study Area which is a floating wind demonstrator project with a 30 MW capacity.

13-39. The closest practice and exercise area (PEXA) to the Study Area is the D809 South area located 5 nm west of the Study Area. The area is operated in accordance with a Clear Range Procedure (CRP) where exercises and firing only take place when the area is considered to be clear of all shipping.

13-40. Inside the Study Area, there are three offshore oil fields, namely: Captain, Ross, and Blake. Each of these three oil fields is currently producing and so will involve vessel operations to supply the associated platforms and the 242 m Bleo Holm Floating Production, Storage and Offloading (FPSO) installation. Four gas pipelines are located within the ECC. Crossings are expected at two locations (Ross Gas line and the Captain Gas Export Line). Further information can be found in **Volume 2, Chapter 12: Infrastructure and Other Users.**

13-41. There are no aggregate extraction license areas identified in the Study Area. There are two dumping grounds located south of the ECC just outside Peterhead Port jurisdiction, the closest of which lies 3.8 nm south of the ECC. A third dumping ground is located in proximity to Cairnbulg Point, 5.1 nm north-west of the ECC.

13-42. The Peterhead (CR070) and North Buchan Ness (CR080) dredge disposal sites are overlapping approximately 1.0 nm north-east of Peterhead Harbour and 3.8 nm south of the ECC.

13-43. There are no charted anchorages or waiting areas in the Study Areas, with the closest anchorage located 18 nm to the south, just outside the Port of Aberdeen. However, areas with a higher density of loitering (vessels transiting at <0.5 kts) have been extracted through traffic analysis. The most loitering is identified to occur around the Ross and Captain Oil Fields, to the south and southwest of the Array Study Area, as well as around the Port of Peterhead and around Fraserburgh.

13-44. The Array Area experiences predominantly south/south-westerly winds and north-north-easterly waves .Wind speeds in the Array Area rarely exceed 25-30kts, with stronger gusts concentrated in winter months (Dec-Feb). Similarly, the significant wave height within the Array Area rarely exceeds 3 m, and higher wave heights are more common during winter and spring (October – April). Tidal current rates between 0.1 and 0.4kts are present during neap tides, while spring tides can see tidal currents up to 0.7kts.

13-45. The Admiralty Sailing Directions report gales (Force 8 winds or above) between 28 days / year (at Wick) and 35 days/ year (at Rosehearty). These gales predominantly occur between October and March.

13-46. Aberdeen Maritime Rescue Coordination Centre (MRCC) is responsible for coordinating SAR activities within the region. The Inverness SAR helicopter base provides aerial capability for the area, and Royal National Lifeboat Institute (RNLI) all-weather lifeboats are located in Peterhead and Fraserburgh. The nearest lifeboat station is Fraserburgh, situated 40.6 nm south of the Array Area and equipped with a Trent class lifeboat.

13.7.2 Existing Marine Activities

13.7.2.1 Vessel Traffic

13.7.2.1.1 Vessel Traffic Survey

13-47. In addition to the datasets described in **Table 13-4**, two 14 day vessel traffic surveys were conducted in compliance with the requirements under MGN654, for both the Array Area and the IRC Area. Therefore, full coverage of all transits through the Study Areas could be obtained using the following data sets:

- Commercial vessel traffic that are required to carry AIS under SOLAS are captured through the vessel traffic surveys and 2021-2022 datasets;
- Recreational and fishing captured through AIS for those vessels that choose to do so and through radar for those that do not; and
- Visual observations to identify non-AIS vessel types.

13-48. A summary of the survey details is provided in **Table 13-6**, and the vessel tracks recorded during the survey are shown in **Figure 13-3.**

Table 13-6: Vessel Traffic Survey Details

Attributes	Summer 2023	Winter 2023
Vessel	Karelle (27.85 m Fishing Vessel)	
Dates (Array Area)	01-Aug-2023 (22:45 UTC) - 15-Aug-2023 (23:00 UTC). – 14 Days	17-Nov-2023 (14:00 UTC) and 03-Dec-2023 (18:30 UTC) – 16 Days
Dates (IRC Area)	16-Aug-2023 (00:00 UTC) - 30-Aug-2023 (01:02 UTC). – 14 Days	03-Nov-2023 (00:11 UTC) and 17-Dec-2023 (11:09 UTC) – 14.5 Days
Downtime	23-Nov-2023 (10:45 UTC) – 25-Nov-2023 (15:15 UTC) [Array]	
Array Roaming Area	2.5 nm Buffer of the Array Area	
IRC Roaming Area	5 nm are in the centre of the 30 km x 30 km IRC Survey Area	
Array Study (Survey) Area	10 nm Buffer of the Array Area	
IRC Survey Area	30 km x 30 km area around the centre point of Cable Route Option B	
Total Vessels Recorded (Array Roaming Area)	75 (5.4/day)	105 (6.6/day)
Total Vessels Recorded (IRC Roaming Area)	220 (15.7/day)	230 (16.4/day)
Cargo	Array Roaming Area: 18 (1.3/day) IRC Roaming Area: 23 (1.6/day)	Array Roaming Area: 21 (1.5/day) IRC Roaming Area: 26 (1.9/day))
Passenger	Array Roaming Area: 2 (0.14/day) IRC Roaming Area: 16 (1.1/day)	Array Roaming Area: 0 (0/day) IRC Roaming Area: 12 (0.9/day)
Fishing	Array Roaming Area: 32 (2.3/day) IRC Roaming Area: 100 (7.1/day	Array Roaming Area: 69 (4.9/day) IRC Roaming Area: 46 (3.3/day)
Recreational	Array Roaming Area: 3 (0.21/day) IRC Roaming Area: 1 (0.1/day)	Array Roaming Area: 0 (0/day) IRC Roaming Area: 0 (0/day)
Tanker	Array Roaming Area: 10 (0.71/day) IRC Roaming Area: 4 (0.3/day)	Array Roaming Area: 6 (0.4/day) IRC Roaming Area: 10 (0.7/day

Attributes	Summer 2023	Winter 2023
Tug & Service	Array Roaming Area: 10 (0.71/day) IRC Roaming Area: 67 (4.8/day)	Array Roaming Area: 8 (0.6/day) IRC Roaming Area: 47 (3.4/day)

2°0'W 1°0'W

58°30'N

58°0'N

57°30'N

Summer 2023

Winter 2023

Project:

Buchan Offshore Wind EIA

Title:

Figure 13-3: Vessel Traffic Surveys

Key

- Array Area
- Array Study Area (10 nm)
- Export Cable Corridor (ECC)
- ECC Study Area (3 nm)
- Indicative IRC Area
- IRC Study Area (10 nm)
- IRC Survey Area
- IRC Roaming Area (2.5 nm Array, 5 nm IRC)

Vessel Track:

- Cargo
- Tanker
- Passenger
- Tug & Service
- Fishing
- Recreational
- Other

AIS collected during Vessel Traffic Surveys. Summer: 01.08.2023 (22:45) - 30.08.2023 (01:02). Winter: 03.11.2023 (00:11) - 03.12.2023 (18:30).

Charts: 0115-0, 1942-0, 0291-0, and 1409-0.

Scale @ A3:1:600,000

Coordinate System: WGS 84 UTM Zone 30N
Graticules: WGS84

0 7 14 21 28 km

N

Date: 08-07-25	Prepared by: MP	Checked by: ES

EIA Ref No: BUC-C-MP-NP-0149

Map Ref: 0223_Vessel_Traffic_Surveys_R02

BUCHAN OFFSHORE WIND

13.7.2.1.2 Vessel Traffic Analysis

13-49. Vessel traffic analysis was undertaken for the AIS data obtained for the periods between 1st January 2023 and 31st December 2023. The collection of radar and visual data during the two 14-day vessel traffic surveys (Section 13.7.2.1.1) was used to supplement the understanding of small craft movements. This section presents a summary of the findings, and further detail and analysis is contained within **Volume 3, Appendix 13.1: NRA.**

13-50. Key commercial vessel routes (defined as routes intersecting the Array or Indicative IRC Area, or carrying > 600 transits / year) through the Study Area identified from the 2023 AIS data have been numbered and are shown in **Figure 13-4**, underlaid by the EMODnet 2023 All Vessel Density. Table X also provides a summary of the key routes, descriptions and number of transits.

Table 13-7: Key Commercial Routes

Route ID	Description	Transits/Year (2023)
1	Route between Aberdeen and the Shetland/Orkney Islands, passing to the west of Array Area	801
2	Route between Pentland Firth and the Baltic, passing to the north of the Array Area	994
4	Route between Pentland Firth and the North Sea (Europe), passing to the south of the Indicative IRC Area and west of Hywind	2385
6	Route between Pentland Firth and Germany, through the Indicative IRC Area	186
7	Route between the north of the Orkney Islands and the North Sea, through the Array Area, east of Blake Oil Field	142
10	Route between Pentland Firth and Europe/North Sea, through the Array Area, just north of the Export Cable Corridor	302
11	Route between the Orkney and Shetland Islands and Europe, through the north-eastern corner of the Array Area	200

13-51. The waters closest to the coastline between Peterhead and Fraserburgh has the highest density due to number of routes/transits that occur to/from Aberdeen, Peterhead and Fraserburgh, as well as some commercial routes operating between Pentland Firth and various European Ports that transit close to the shore, such as Route 4 in **Figure 13-4**. Another route with the high vessel density is the main commercial route through the area to the west of the Array Area between Aberdeen/Peterhead and the Shetland/Orkney Islands. Other notable routes through the area include:

- The route between Pentland Firth and the Baltic, to the north of the Array Area (Route 2 in Figure 13-4);
- The north-south Tug and Service route between Aberdeen and the Ross Oil Field, just south of the Array Study Area; and
- The cargo and service route between Aberdeen/Peterhead and the oil and gas fields to the north-east of Shetland.

13-52. There is extensive tug and service activity within the Study Area (4,800 transits within the Array Study Area, and 8,025 transits through the IRC Study Area), primarily due to vessels

servicing oil and gas infrastructure. The activity shown in the coastal region of the Study Area is potentially due to vessels transiting between ports in the region and will include tugs, workboats, dredgers along with the supply vessels that operate in the region.

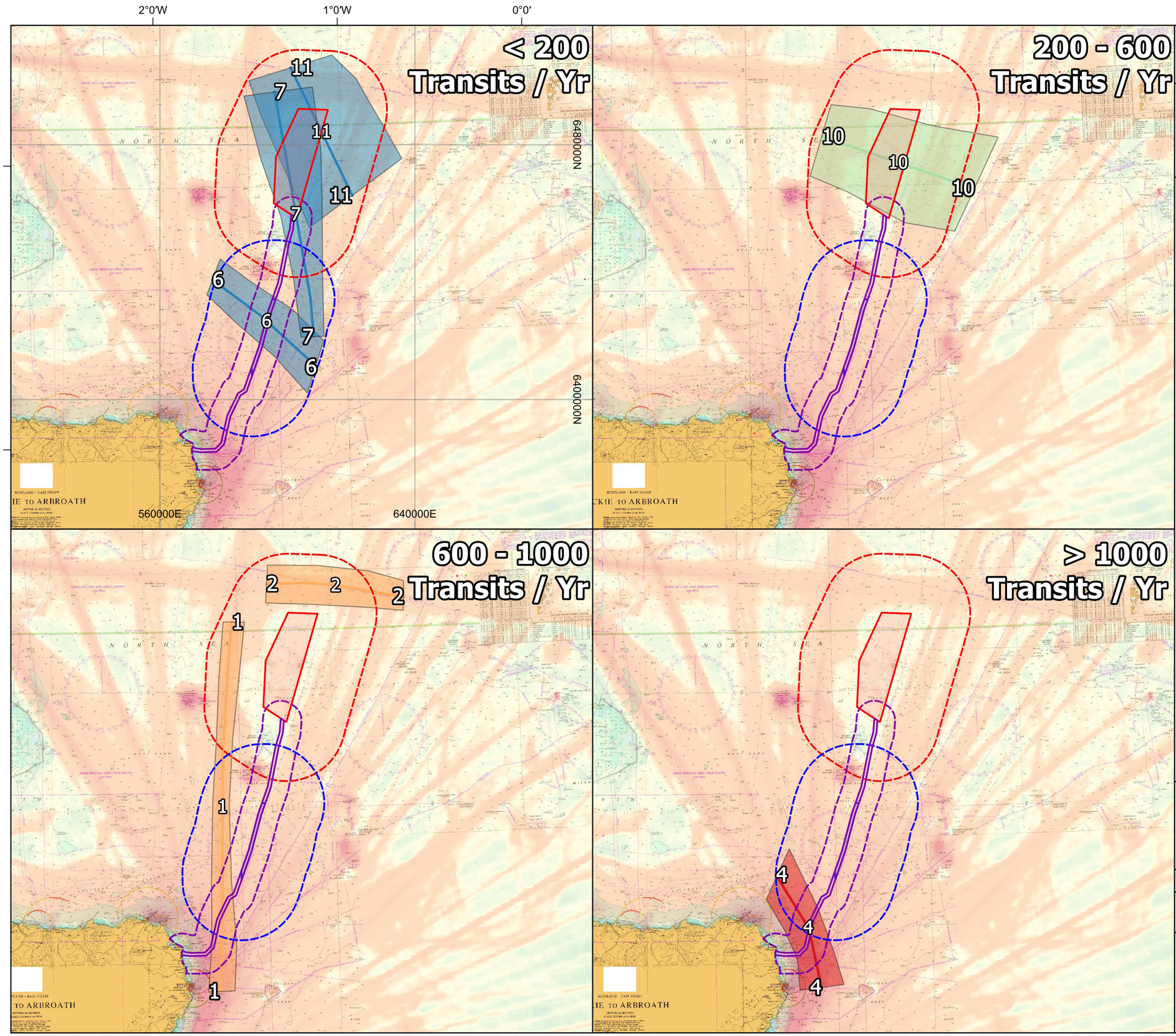
13-53. Fishing vessel activity in the Study Area is similar to that of Tug and Service vessels in the Array Study Area (4,971 transits) but much less in the IRC Study Area (3,563 transits). The fishing vessel activity is concentrated heavily around the main fishing ports of Fraserburgh (the largest fishing port in Europe) and Peterhead, with a lower density in and around the Array Area.

13-54. Most of the fishing and tug & service vessels in the area are < 100 m length overall (LOA), which meant that 88% of all the vessels recorded in the Study Area in 2023 were < 100 m LOA. Yet, commercial vessels over 250 m LOA are present in the Study Area, mainly confined to the routes to/from Pentland Firth.

13-55. There were 1,859 individual cargo vessel tracks through the Array Study Area during 2023, and 2,080 through the IRC Study Area. One of the main cargo routes through the area is the route to the north of the Array Area which is a main route between the Pentland Firth and the approaches to the Baltic Sea. Another notable route is shown along the western side of the Study Area in a north-south orientation with vessels transiting to or from the Shetland Islands. Of particular note on this route, are two cargo vessels, operated by NorthLink, on regular routes between Aberdeen and the Shetland Islands or Orkney Islands carrying freight and livestock. Tankers in the Study Area generally follow similar routes to the cargo vessels but with a lesser density.

13-56. Passenger vessels in the Study Area include both ferry and cruise vessels. Several cruise vessels transit through the area on route to/from the Shetland and Orkney Islands when on passages around Scandinavia and northern Europe. Passenger ferry vessels follow two main routes through the Study Area, both of which are between Aberdeen and the Orkney/Shetland Islands and primarily serviced by two NorthLink ferries. One follows a north-south orientation crossing just west of the Array Area, while the other follows a southeast-northwest orientation crossing the southern extent of the IRC Study Area.

13-57. There is little recreational activity around the Array Area given its distance offshore. The recreational vessel activity in the Study Area is concentrated heavily around the shore, between Fraserburgh and Peterhead, likely due to trying to avoid the large oil and gas infrastructure and the more weather-exposed areas.



Project:

Buchan Offshore Wind EIA

Title:

Figure 13-4: Key Commercial Vessel Routes

Key

- Array Area
- Array Study Area (10 nm)
- Indicative IRC Area
- IRC Study Area (10 nm)
- Export Cable Corridor (ECC)
- ECC Study Area (3 nm)

Transits / Year (2023):

- < 200
- 200 - 400
- 400 - 600
- 600 - 1,000
- > 1,000

Route Centrelines (Transits / Year):

- < 200
- 200 - 400
- 400 - 600
- 600 - 1,000
- > 1,000

Routes derived from AIS data from MadeSmart (full year 2023).

Density from EMODnet (2023).

Charts: 0115-0, 1942-0, 0291-0, and 1409-0.

Scale @ A3:1:1,200,000

Coordinate System: WGS 84 UTM Zone 30N
Graticules: WGS84

0 10 20 30 40 km

N

Date: 08-07-25	Prepared by: MP	Checked by: ES

EIA Ref No: BUC-C-MP-NP-0150

Map Ref: 0223_Major_Routes_R02

BUCHAN OFFSHORE WIND

13.7.2.2 Maritime Incidents

13-58. Maritime incidents recorded in the Study Area by the Marine Accident Investigation Branch (MAIB) (1992-2023) and RNLI (2008-2023) databases have been collated and presented. This was the most up-to-date incident data available at the time this assessment was undertaken. When processing the incidents, non-navigational incidents were removed, such as shore-based activities (e.g. people cut off by the tide or swimmers in distress). Furthermore, duplicate values recorded in both databases were removed so as to not incorrectly increase the count of incidents.

13-59. The recorded MAIB (1992-2023) and RNLI (2008-2023) incidents which occurred in the Study Area are summarised in 5-year intervals **Table 13-8** and **Table 13-9**, respectively.

Table 13-8: MAIB Recorded Maritime Incidents within the Study Area (1992-2023)

Year	Incident Category								
	Capsize/ Flooding/ Foundering	Collision	Contact	Fire/ Explosion	Grounding	Mechanical/ Damage	Near Miss	Personal Injury	Total
1992 – 1996	**5**	**1**	0	0	0	**9**	**5**	**3**	**23**
1997 - 2001	**2**	**1**	0	**1**	**1**	**4**	**3**	**8**	**20**
2002 - 2006	**3**	**1**	0	**1**	0	**10**	**4**	**5**	**24**
2007-2011	**2**	0	0	**1**	**1**	**11**	0	**6**	**21**
2012-2016	**1**	0	0	**1**	**1**	**4**	**2**	**1**	**10**
2017-2023	0	**1**	0	**1**	0	**12**	0	**7**	**21**
Total	13	4	**0**	5	3	50	14	30	119

Table 13-9: RNLI Recorded Maritime Incidents within the Study Area (2008-2023)

Year	Incident Category							
	Adverse Weather	Capsize/ Flooding/ Foundering	Fire/Explosion	Grounding	Mechanical/ Damage	Personal Injury	Other	Total
2008-2012	**1**	**3**	0	0	**6**	**6**	0	**16**
2013-2017	**2**	**2**	0	0	**5**	**1**	**1**	**11**
2018-2023	0	0	0	0	**8**	**3**	**7**	**18**
Total	3	5	**0**	**0**	19	10	8	45

13-60. Most incidents are recorded close to shore, around the nearby ports, with reducing frequency the further offshore the location is. There were four recorded incidents which occurred in the Array Area, one of which was a personal injury on board a fishing vessel. Two mechanical/damage incidents were reported within the Array Area, one of which was a fishing vessel in 1997, and the other was a service vessel in 1993.

13-61. Since 2008, one capsize/flooding/foundering incident was recorded: a fishing vessel took on water during rough weather in 2009 which required the RNLI to provide assistance.

13-62. Further analysis of maritime incidents, including detail on background incident rates within other offshore windfarms is contained **in Section 6.3 of Volume 3, Appendix 13.1: NRA** and an analysis of incident rates at UK OWFs is presented by Rawson and Brito (2022).

13.7.3 Future Changes

13-63. The EIA Regulations require that a "description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Proposed Offshore Development as far as natural changes from the baseline scenario can be assessed with reasonable effort, on the basis of the availability of environmental information and scientific knowledge" is included within the EIAR. This

reflects how the baseline relevant to shipping and navigation is expected to evolve without the Proposed Offshore Development.

13.7.3.1 Commercial Traffic

13-64. Analysis of the future case traffic profile has been undertaken within **the Volume 3, Appendix 13.1: NRA**. The Department for Transport (DfT) publishes historical and projected port statistics, including annual freight quantities and transits which can be used as an indicator of long-term trends. Projected freight traffic into UK major ports, produced by the DfT in 2019. Overall, port traffic is forecast to remain relatively flat in the short term but grow in the long term, with tonnage 39% higher in 2050 compared to 2016. This equates to approximately a 15% increase in national freight tonnage by 2035. The long-term growth in port traffic is driven by increases in unitised freight traffic, which compensates for decreases in other freight in the short term. Liquid bulk traffic (principally crude oil) has the largest forecasted decreases, continuing a historical trend. Similarly, general cargo is forecast to decrease, in line with the historic decreasing trend, which is likely driven by increased containerisation of goods. Dry bulk traffic is forecast to have a relatively large decrease in the short term, driven primarily by demand for coal being projected to fall. In the long term, the decrease associated with coal will be offset primarily by biomass resulting in an overall increase. Unitised freight (motor vehicles, Twenty-foot Equivalent Units (TEUs) Lifton/Lift-off (Lo-Lo) and Roll-on/Roll-off (Ro-Ro)) are all forecast to grow strongly, driven by economic growth.

13-65. More locally to the Proposed Offshore Development, a decline in annual freight has been seen at regional ports such as Cromarty Firth, as well as local ports such as Fraserburgh and Wick.

13.7.3.2 Passenger Traffic

13-66. The majority of passenger vessel traffic through the Study Area is operated by NorthLink Ferries. Therefore, the historic trend of annual NorthLink ferry passenger carryings was considered to provide insight into the potential future passenger traffic through the area. The data show a gradual increase in total passengers between 2013 and 2019. The number of passengers reduced sharply in 2020 as a result of the Covid-19 pandemic, but recovered previous levels after the lifting of COVID-19 related restrictions, reaching just 2% below pre-pandemic levels in 2022, and exceeding these by 16% in 2023.

13-67. However, the increase in the total number of NorthLink ferry passengers was largely driven by passengers travelling on the Stromness – Scrabster route, which is currently serviced by the MV Hamnavoe, and runs over 50 nm outside the Study Area. The routes which operate within the Study Area (Aberdeen – Lerwick and Aberdeen – Kirkwall) have had a more consistent number of passengers since 2013, with only a small increase over the time period, primarily within the last few years pre and post-pandemic. Given this trend, it is anticipated that the number of passengers using the two primary ferry routes within the Study Area will remain relatively flat in the short-term with potential growth in the long-term.

13.7.3.3 Fishing

13-68. There is limited information available for future fishing vessel activity. UK fisheries analysis by the Marine Management Organisation (MMO) for the International Council for the Exploration of the Seas (ICES) Rectangle 45E8 shows a variation in landings between 2015

and 2019. In 2015, this was 95 tonnes, increasing to 172 tonnes in 2016, but reducing to 45 tonnes in 2018.

13-69. It is anticipated that fishing activity is unlikely to change over the next 5 years, with both UK and non-UK vessels continuing to be active in the region as per the Trade and Cooperation Agreement (TCA) agreed to by the UK upon exit from the EU and applicable from January 2021. More detail on expected future changes according to different fishing types can be found in **Volume 2, Chapter 11 Commercial Fisheries**. Nevertheless, as this transition period is confirmed until June 2026, in the event that there is a reduction in non-UK fishing activity due to restrictions, it is anticipated that this will be balanced by an increase in UK fleet capacity.

13-70. It is noted that fisheries patterns can change based on a range of factors, including market demand and prices, abundance of stock and sustainability. However, given that the main fishing activities that take place in proximity to the Study Area are well-established with well-defined fishing grounds, particularly the scallop fishery, it is therefore envisaged that fishing activity levels in proximity to the Study Area will remain constant for the next 15 to 20 years. Further information is located in **Volume 2, Chapter 11: Commercial Fisheries**.

13.7.3.4 Recreational

13-71. The UK-wide RYA Water Sports Participation Survey conducted in 2019 found that the proportion of adults participating in boating activities has fluctuated between 6% and 8% between 2002 and 2018. Between 2008 and 2018, the proportion participating in yacht cruising, motor boating and power boating have remained consistent at 0.8%, 1.1% and 0.7% respectively. More recent data published in the 2022 Water Sports Participation Survey is greatly influenced by COVID-19 with a considerable variation between 2021 and 2022 due to national/local lockdowns. Therefore, it is unlikely that there will be an appreciable change in the number of recreational users due to macro trends.

13.7.4 Data Limitations and Assumptions

13-72. AIS is not necessarily required on all recreational or fishing vessels, dependent on size. Therefore, AIS analysis alone would underestimate the extent of these activities. The vessel traffic survey using visual and radar observations has been combined with secondary sources (such as VMS or the RYA Coastal Atlas) and consultation to complete the picture of small craft vessel movements.

13-73. The incident data is unlikely to capture all incidents, with underreporting of minor incidents likely. However, the combination of RNLI and MAIB has been used to collate the most complete dataset possible. Not all information, particularly position, is captured in every incident report, but there were no data deficiencies that presented concern. Unreported minor incidents are highly unlikely to affect the results of this assessment. Extensive research and consultation provide confidence that all incidents that may have an effect on the outcomes of this assessment have been included.

13-74. Relevant nautical publications, such as 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. Consultation with local operators, including NorthLink Ferries, RYA Scotland and SPFA (**Table 13-3**), has been used to verify the baseline.

13.7.5 Impacts scoped out of the assessment

As per The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, the Proposed Offshore Development received a Scoping Opinion from Marine Directorate (SCOP - 0031) which, alongside the understanding of maximum design scenarios and environmental baseline conditions, and further consultation with stakeholders, formed the basis for the likely significant effects that would be scoped out from further assessment in EIA. None of the likely significant effects identified in the Scoping Report were scoped out of this shipping and navigation assessment.

13.8 METHOD FOR ASSESSMENT

13.8.1 Overview

13-75. Assessment of likely significant effects in this Chapter will follow the general approach outlined in **Volume 1, Chapter 5: EIA Methodology** of the EIAR. In addition, guidance, policy and legislation relevant to shipping and navigation as detailed in **Section 13.3** has been considered in the assessment of likely significant effects.

13.8.2 Criteria for Assessment

13-76. The process for determining the likely significance of effects is a two-stage process that involves defining the magnitude of the likely significant effects and the sensitivity of the receptors. This section describes the criteria applied in this chapter to assign values to the magnitude of likely significant effects and the sensitivity of the receptors. For the purposes of the shipping and navigation assessment, the terminology has been equated to that utilised within the NRA (Appendix 13.1), in line with section 2.4 of the Methodology for Assessing Marine Navigational Safety & Emergency Response Risks of OREI (MCA, 2021). As a result, magnitude is equated to the likelihood of an incident or impact occurring, whilst sensitivity is equated to the consequence of that impact occurring, to ensure consistency between this Chapter and the NRA (see **Section 3 of the NRA [Appendix 13.1]**).

13-77. The criteria for defining magnitude/likelihood and receptor sensitivity/consequence in this chapter are outlined in the following sections.

13.8.2.1 Magnitude

13-78. The magnitude criteria for shipping and navigation are provided in **Table 13-10**. In determining magnitude, each assessment considered the spatial extent, duration, frequency, and reversibility of impact and these are outlined within the magnitude section of each assessment of impact (e.g., a duration of hours or days would be considered for most receptors to be of short-term duration, which is likely to result in a low magnitude of impact).

Table 13-10 Impact Magnitude/Likelihood Criteria for Shipping and Navigation

Magnitude	Description
Negligible	•Remote probability of occurrence at the Proposed Offshore Development and few examples in wider industry. •<1 occurrence per 1,000 years
Low	•Extremely unlikely to occur at the Proposed Offshore Development and has rarely occurred in wider industry. •1 per 100 – 1,000 years
Medium	•Unlikely to occur at the Proposed Offshore Development during Proposed Offshore Development lifecycle and has occurred at other OWFs. •1 per 10 – 100 years
High	•May occur once or more during OWF lifecycle. •1 per 1 – 10 years
Very High	•Likely to occur multiple times during OWF lifecycle. •Yearly

13.8.2.2 Sensitivity

13-79. The Sensitivity criteria for shipping and navigation receptors are provided in **Table 13-11**.

Table 13-11 Receptor Sensitivity/Consequence Criteria for shipping and navigation

Sensitivity	Description
Negligible	•minor injury; •minor damage (< £10k); • minor spill; and •minimal disruption to operators/marine users.
Low	•multiple minor injuries; •minor damage (< £100k) to vessel; •minor pollution (Tier 1 as per MCA, 2017); and •short-term disruption to operators/marine users.
Medium	•serious injuries; •damage to vessel (< £1 million); •moderate pollution (Tier 2 as per MCA, 2017); and •temporary disruption to operators/marine users.
High	•single fatality/serious injuries; •serious damage to vessel (< £10 million); •serious pollution (Tier 2 as per MCA, 2017); and •prolonged disruption to operators/marine users.
Very High	•multiple loss of life; •loss of vessel (> £10 million); •major pollution (Tier 3 as per national contingency plan (MCA, 2017)); and •long-term disruption to operators/marine users.

13.8.2.3 Likely Significance of Effect

13-80. By assigning and combining magnitude and sensitivity criteria, overall effect significance upon shipping and navigation receptors can be determined (**Table 13-12**).

Table 13-12 Effect Significance Matrix

		Sensitivity/Consequence				
		Negligible	**Low**	**Medium**	**High**	**Very High**
Magnitude/ Likelihood	**Very High**	Minor/Moderate	Moderate/Major	Major	Major	Major
	High	Minor/Moderate	Moderate	Moderate/Major	Major	Major
	Medium	Minor	Minor/Moderate	Moderate	Moderate/Major	Major
	Low	Negligible/Minor	Minor	Minor/Moderate	Moderate	Moderate/Major
	Negligible	Negligible	Negligible/Minor	Minor	Minor/Moderate	Minor/Moderate

13-81. In cases where a range is suggested for the significance of effect, there remains the possibility that this may span the significance threshold (i.e. the range is given as minor to moderate). In such cases the final significance conclusion is based upon the author's professional judgement as to which outcome delineates the most likely effect. Where professional judgement is applied to quantify final significance from a range, the assessment will set out the factors that result in the final assessment of significance. These factors may include the likelihood that an effect will occur, data certainty and relevant information about the wider environmental context

13-82. For the purposes of this assessment, any effects with a significance level less than moderate have been concluded to be not significant in terms of The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

13-83. Significant effects are therefore considered important in the decision-making process. Effects significance has been derived using the NRA Methodology (**Section 3 of the NRA [Appendix 13.1]**), in accordance with MGN654, and is defined in **Table 13-13**.

Table 13-13 Effect Significance Definitions

Effect Significance	Definition
Major	Proposed Offshore Development would pose an unacceptable risk to navigation or appreciable adverse impacts on vessel operations, resulting in a significant effect.
Moderate	Proposed Offshore Development would pose a moderate risk to navigation or impact to vessel operations which is not considered to be As Low as Reasonably Practicable (ALARP), resulting in a significant effect.
Minor	Proposed Offshore Development would pose a risk to navigation or impact to vessel operations which is either broadly acceptable or considered to be ALARP and therefore tolerable, resulting in no significant effect.
Negligible	No detectable change to shipping and navigation receptors, resulting in no significant effect.

13.9 MAXIMUM DESIGN SCENARIO

13-84. Details of the Proposed Offshore Development activities and key components are provided in **Volume 1, Chapter 4: Project Description**. As this assessment is using the Design Envelope approach, a maximum design scenario (MDS) has been selected for each impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values.

13-85. **Table 13-14** presents the maximum design scenario for each impact associated with shipping and navigation, along with the justification.

Table 13-14 Maximum Design Scenarios Considered for Impacts for Assessment of Likely Significant Effects on Shipping and Navigation

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
Impact on Floating Mooring and Cable Systems and Interactions with Vessels at Risk of Snagging	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Export Cable Corridor with a length of 86.5 km; • •Up to three export cable circuits within the ECC, which will be buried were practicable (see note). •Maximum cable protection length for all of the export cables in the ECC, with a height of up to 1.8 m; •Maximum mooring spread of 1,750 m radius from each Wind Turbine Generator (WTG); •Up to 2 cable crossings, each crossing has a potential Berm Height of 2.4 m, width of 21.4 m and cross-sectional area of 34.1 m^2; **Operations and maintenance phase** •Operational life of 35years ; •Lengths and dimensions of cables, cable protection and cable crossings as described for construction phase •Maximum mooring spread of 1,750 m radius from each WTG; **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	There is potential for underwater obstructions without a corresponding WTG structure during construction, and vessels can potentially snag fishing gear or anchors on this infrastructure The MDS has been taken as the longest length of export cable, minimum cable burial depth and maximum length/quantities of cable protection, and maximum mooring spread over the greatest duration of the Proposed Offshore Development, and therefore the highest potential for increases in the risk of anchor and/or gear snagging.
Impact on commercial and ferry routes, including rerouteing/deviation of lifeline services	✓	✓	✓	**Construction phase** •Up to Six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2) and a 86.5 km long Export Cable Corridor, which will be buried were practicable (see note). **Operations and maintenance phase** •Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km^2), a 86.5 km long Export Cable Corridor, and maximum IRC platform dimension (80 m x 62.5 m x 35 m) located in the southwestern corner of Indicative IRC Area. **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	Commercial vessels and ferries will potentially be displaced from existing routes due to the presence of the Proposed Offshore Development. The MDS has been taken as the greatest extent of the Proposed Offshore Development over the longest duration, which would impact the most routes whilst vessels navigate around the Buchan Array Area and IRC Platform and therefore have the greatest potential for impacts on commercial operators and routes.
Impact on Commercial Fishing Safety	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2) and a 86.5 km long Export Cable Corridor, which will be buried were practicable (see note). **Operations and maintenance phase** •Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km2), a 86.5 km long Export Cable Corridor, and maximum IRC platform dimension (80 m x 62.5 m x 35 m) located in the southwestern corner of Indicative IRC Area; •Maximum mooring spread of 1,750 m radius from each WTG. **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction;	Fishing vessels may be displaced from their current routes and/or fishing locations due to the presence of infrastructure and activities associated with the Proposed Offshore Development. The greatest extent of the Proposed Offshore Development over the longest duration, would impact the most routes whilst fishing vessels navigate around the Array Area and IRC Platform and therefore this would have the greatest potential for restricting access to fishing grounds or interfering with fishing activities and has been taken as the MDS.

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				•During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	
Impact on Recreational Vessel Safety	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2) and a 86.5 km long Export Cable Corridor, which will be buried were practicable (see note). **Operations and maintenance phase** •Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km2), a 86.5 km long Export Cable Corridor, and maximum IRC platform dimension (80 m x 62.5 m x 35 m) located in the southwestern corner of Indicative IRC Area. **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	Recreational vessels may be displaced from their current routes due to the presence of infrastructure and activities associated with the Proposed Offshore Development. The MDS has therefore been taken as the greatest extent of the Proposed Offshore Development over the longest duration, which would impact the most routes whilst vessels navigate through or deviate around the Array Area, IRC Platform and therefore have the greatest potential for impacts on recreational vessel activity
Impact on Risk of Allision	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km2); •Maximum number of WTGs (70) plus three Offshore Substation Platforms (OSPs) (109 m x 64 m x 35 m); •Minimum air draught clearance from Mean High Water Springs (MHWS) of 30 m; •Up to 2,471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels). **Operations and maintenance phase** • Indicative operational life of 35 years; •WTG numbers, dimensions, area and supporting infrastructure as described for construction phase; •Maximum IRC platform dimension (80 m x 62.5 m x 35 m) located in the southwestern corner of Indicative IRC Area; •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)). **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of r construction •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	Infrastructure in the area will create a risk of allision/contact for either powered or drifting vessels transiting the area. As a result, the MDS for this impact has been taken as the greatest extent of the Proposed Offshore Development with the maximum number of structures, the maximum number of project- vessel movements, and over the longest duration, as this will cause the highest potential for increases in the risk of allision/contact.
Impact on Risk of Collision	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2); •Up to 91 construction vessels on site at any one time (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels); •Up to 2,471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	Marine craft associated with construction will be transiting to/from the area throughout the construction period. There will be potential interaction with other vessels transiting the area which leads to an increased risk of collision. The MDS has therefore been taken as the greatest extent of the Proposed Offshore Development with the

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels). **Operations and maintenance phase** • Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km2), a 86.5 km long Export Cable Corridor, and maximum IRC platform dimension (80 m x 62.5 m x 35 m) located in the southwestern corner of Indicative IRC Area; •Up to 18 operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)); •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)). **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	maximum number of structures, the maximum number of project-vessel movements, and over the longest duration, creating the highest potential for increases in the risk of collision.
Impact on Under Keel Clearance Due to Subsurface Infrastructure	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Export Cable Corridor with a length of 86.5 km, which will be buried were practicable.. • •Up to three export cables within the ECC; •Maximum cable protection length for all of the export cables in the ECC, with a height of up to 1.8 m; •Maximum mooring spread of 1,750 m radius from each WTG; •Up to 2 cable crossings, each crossing has a Berm Height of 2.4 m, width of 21.4 m and cross-sectional area of 34.1 m^2. **Operations and maintenance phase** •Indicative operational life of 35 years; •Lengths and dimensions of cables, cable protection and cable crossings and moorings as described for construction phase; **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	Use of cable protection associated with the Proposed Offshore Development has the potential to reduce the available depth of water along the cable route. This would reduce the available under keel clearance for vessels transiting the area, particularly in the nearshore region of the ECC. As a result, the longest length of export cable, minimum cable burial depth and maximum length/quantities of cable protection and maximum mooring spread over the greatest duration of the Proposed Offshore Development has been taken as the MDS, given this combination would have highest potential for reductions in under keel clearance (UKC) and increases in the risk of anchor and/or gear snagging.
Impact on SAR capabilities	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km2) and a 86.5 km long Export Cable Corridor; •Maximum number of WTGs (70) and three OSPs (109 m x 64 m x 35 m); •WTGs: maximum rotor diameter of 236 m, maximum blade tip height of 340 m and minimum WTG spacing of 1,420 m between WTGs in a row and 1,420 m between rows of WTGs; •Up to 91 construction vessels on site at any one time (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels); •Up to 2,471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels,	The potential for reduced access for SAR responders due to infrastructure may affect SAR capability. This along with the increase in vessel activity may result in an increase in incidents further affecting capability. Therefore, the MDS has been taken as the greatest extent of the Proposed Offshore Development with the maximum number of structures, the maximum number of project-vessel movements, and over the longest duration, creating the highest potential for impacts to SAR capabilities.

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels). **Operations and maintenance phase** •Indicative operational life of 35 years; •WTG numbers, dimensions, area and supporting infrastructure as described for construction phase; •Up to 18 operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)); •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)); **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	
Impact on Communications, Radar and Positioning Systems	✓	✓	✓	**All phases** •Construction and decommissioning duration up to six years; •Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km2); •Maximum number of WTGs (70) plus three OSPs (109 m x 64 m x 35 m); •Minimum WTG spacing of 1,420 m between WTGs in a row and 1,420 m between rows of WTGs.	Communication and positioning systems may be affected by the presence of infrastructure The MDS has therefore been taken as the greatest extent of the Proposed Offshore Development over the longest period with the most WTGs and smallest spacing, as this will have the greatest potential to exacerbate the impacts on marine navigation, communications and positioning systems.
Impact on Risk of Grounding	✓	✓	✓	**All phases** •Construction and decommissioning duration up to six years; •Indicative operational life of 35 years; •Export cables: up to three cables within the ECC (length 86.5 km) , which will be buried were practicable (see note). •Cable protection height up to 1.8 m. Up to 2 cable crossings, each crossing has a Berm Height of 2.4 m, width of 21.4 m and cross-sectional area of 34.1 m^2; •Up to 2,471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels); •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)).	Changes to vessel routeing as a result of the cable or project vessels may lead to a potential increase in the risk of grounding. Given the water depths offshore, this is most likely nearshore, as a result of deviations around ECC activities or around the IRC platform. The MDS has therefore been taken as the greatest extent of the IRC Platform over the longest period, and the maximum number of project-vessel movements, as this will have the greatest potential to impact nearshore routeing and consequently increase the risk of grounding.
Impact of WTG Breakout on Vessel Safety	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2); •Maximum number of WTGs (70) plus three OSPs (109 m x 64 m x 35 m); •Minimum air draught clearance from MHWS of 30 m; •Up to 2, 471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels). **Operations and maintenance phase**	The breakout of a WTG or WTG blade will create a risk of allision/contact for either powered or drifting vessels transiting the area. The MDS has therefore been taken as the greatest extent of the Buchan Offshore Wind Proposed Offshore Development with the maximum number of structures, the maximum number of Proposed Offshore Development vessel movements, and over the longest duration, as this will have the highest potential for increases in the risk of a

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				•Indicative operational life of 35 years •WTG numbers, dimensions, area and supporting infrastructure as described for construction phase; •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)). **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	WTG breakout and for this to have an impact on vessel safety.
Impact on access to Ports and Harbours	✓	✓	✓	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the 86.5 km long Export Cable Corridor; •Up to 91 construction vessels on site at any one time (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels); •Up to 2,471 installation vessel movements (return trips) during construction (including main installation/support vessels, tug/anchor handlers, cable lay vessels, guard vessels, survey vessels, seabed preparation vessels, CTVs, scour protection installation vessels and cable protection installation vessels); •Export cables: up to three cables within the ECC which will be buried were practicable (see note). • Cable protection with a height of up to 1.8 m. Up to 2 cable crossings, each crossing has a Berm Height of 2.4 m, width of 21.4 m and cross-sectional area of 34.1 m^2. **Operations and maintenance phase** •Indicative operational life of 35 years; •Maximum of 86.5 km long Export Cable Corridor •Export cables: up to three cables within the ECC. Cable protection with a height of up to 1.8 m. Up to 2 cable crossings, each crossing has a Berm Height of 2.4 m, width of 21.4 m and cross-sectional area of 34.1 m^2; •Up to 18 operations and maintenance vessels on site at any one time (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)); •Up to 140 operations and maintenance vessel movements (return trips) each year (including CTVs/workboats, cable repair vessels, anchor-handling vessels or similar and remotely operated vehicles (ROVs)). **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be a reverse of construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	Access to local ports may be affected by the presence of the Proposed Offshore Development, primarily the ECC and IRC Platform, and operations/vessel movements associated with it. The MDS has therefore been taken as the greatest extent of the Proposed Offshore Development ECC over the longest duration, with maximum number of construction and operation/maintenance vessels as this will have the greatest potential impact on access into ports and harbours.
Impact of Towage (excluding wet storage) Operations	✓	✓	✓	**All phases** •Construction and decommissioning duration up to six years; •Indicative operational life of 35 years; •Maximum extent of Buchan Array Area (330 km^2); •Maximum number of WTGs (70) plus three OSPs (109 m x 64 m x 35 m).	Towage (excluding wet stowage and assembly given its separate assessment) will be required to take assembled floating infrastructure from/to the point of storage to/from the Array Area during the construction phase and for occasional maintenance during operation. There is potential for impacts to occur during these operations including breakout and interaction with other vessels.

Potential Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
					The MDS has therefore been taken as the maximum number of WTGs over the longest duration, which would mean the greatest number of towage operations, and hence the greatest impact on vessel traffic.
Impact of Small Movements of Floating Installations around the Nominal Central Location	×	✓	×	**Construction phase** •Up to six years construction duration; •Construction activities over the maximum extent of the Buchan Array Area (330 km^2); •Maximum number of WTGs (70) plus three OSPs (109 m x 64 m x 35 m); •Minimum WTG spacing of 1,420 m between WTGs in a row and 1,420 m between rows of WTGs; •Minimum air draught clearance from MHWS of 30 m. **Operations and maintenance phase** •Indicative operational life of 35 years; •WTG numbers, dimensions, area and supporting infrastructure as described for construction phase; •Minimum WTG spacing of 1,420 m between WTGs in a row and 1,420 m between rows of WTGs. **Decommissioning phase** •The duration of the decommissioning programme is anticipated to be the same as for construction; •During the decommissioning phase the changes would gradually decrease from the operational MDS as the need for project-related vessels is reduced, and anchor structures are removed and/or cut below the seabed, according to the nature of the chosen anchoring system.	The movement of floating infrastructure is dependent on the mooring technology and arrangements to be used. There is potential for this to result in effects on vessels progressing through the Array Area or for SAR. The MDS has therefore been taken as the greatest extent of the Proposed Offshore Development with the maximum number of structures, and the minimum WTG spacing, over the longest duration, as this will have the highest potential for small movements of WTGs around the central position to have an impact on nearby vessels.
Note: It is strongly preferred that the offshore export cables are buried, however the ability to do this is determined by sediment types and ground conditions. Cable burial depths have been informed by a Cable Protection Assessment and are expected to be up to 2.4m, with a target depth of 1.5m.					

13.10 EMBEDDED MITIGATION AS PART OF THE PROPOSED OFFSHORE DEVELOPMENT

13-86. As part of the Proposed Offshore Development design process, several designed-in (embedded) mitigation measures have been proposed to reduce the potential for impacts on environmental receptors. As there is a commitment to implementing these measures, they are considered inherently part of the design of the Proposed Offshore Development and have therefore been considered in the assessment (i.e., the determination of magnitude and therefore significance assumes implementation of these measures). These measures are considered standard industry practice for this type of development. The embedded commitments relevant to shipping and navigation are presented in **Table 13-15** and **Volume 3, Appendix 1.1: Commitments, Mitigation and Monitoring Register** which provides additional information on how these commitments are secured.

Table 13-15 Embedded Mitigation (EM) Measures of Relevance to Shipping and Navigation

Reference	Embedded Mitigation Measure	Description	Justification	How it will be Secured
Proposed Offshore Development Design				
EM 20	Aids to Navigation (AtoN)	Suitable AtoN lighting and marking the OWF site shall be undertaken complying with IALA Recommendations G1162 (IALA, 2021), to be finalised and approved in consultation with MCA and NLB through a Lighting and Marking Plan (LMP).	Risk of allision with structures.	Secured through commitments made in PMP5: proposed Lighting and Marking Plan (pLMP)
EM 21	Buoyed construction site	Buoys deployed around construction areas of the Proposed Offshore Development in line with Northern Lighthouse Board (NLB) requirements developed consultation with MCA and NLB through the LMP.	Risk of allision with structures or collision with construction vessels.	Secured through commitments made in PMP3: proposed Navigational Safety and Vessel Management Plan (pNSVMP) and PMP5: pLMP.
EM 28	Air Draught Clearance	WTG design to target a minimum blade tip height of 30 m above mean sea level (MSL) (30 m Air Gap).	Risk of allision/contact with structures.	Secured in the Section 36 Consent and Marine Licence.
EM 31	Moorings Design	Adherence with HSE/MCA guidance "Regulatory expectations on moorings for floating wind and marine devices" as appropriate to the Proposed Offshore Development (HSE/MCA, 2017).	Risk of grounding or snagging of gear, and risk of WTG breakout.	Secured in the Section 36 Consent and Marine Licence
Promulgation and Awareness				
EM 18	Site Marking and Charting	Proposed Offshore Development is marked on nautical charts including an appropriate chart note.	All direct impacts of the Proposed Offshore Development.	Secured in the Section 36 Consent and Marine Licence.
EM 22	Promulgation of information	Timely and efficient distribution of Notice to Mariners (NtM), Kingfisher bulletin publications and other navigational warnings of the position and nature of works associated with the Proposed Offshore Development.	All direct impacts of the Proposed Offshore Development.	Secured through commitments made in PMP3: pNSVMP and PMP4: proposed Aids to Navigation Management Plan (pAtoNMP).
EM 25	Fisheries Mitigation Monitoring and Communication Plan (FMMCP)	Development of and adherence to a pFMMCP. The pFMMCP will set out the means of ongoing fisheries liaison through construction and O&M phases of the Proposed Offshore Development and detail any	Fishing hazards, including snagging of gear.	Secured in the Section 36 Consent and Marine Licence.

Reference	Embedded Mitigation Measure	Description	Justification	How it will be Secured
		mitigation measures to be put in place to limit effects on commercial fisheries activity. This will include the following project policies: Fisheries Liaison Policy and Engagement Schedule, Conflict Avoidance Policy, Incident Response Policy..		
EM 29	Periodic hydrographic surveys	MGN 654 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UK Hydrographic Office (UKHO).	Risk of grounding or snagging of cables/gear.	Secured in the Section 36 Consent and Marine Licence.
Planning (PLAN)				
EM 6	Marine Pollution Contingency Plan	Development of a Marine Pollution Contingency Plan which will outline procedures to protect any personnel working and to safeguard the marine environment alongside any mitigation measures in the event of any accidental pollution events arising from offshore operations relating to the Proposed Offshore Development.	Risk of pollution as a result of a WTG breakout, an allision with structure and/or a collision.	Secured in the Section 36 Consent and Marine Licence and the commitments in PMP 9: proposed Marine Pollution Contingency Plan (pMPCP).
EM 9	Cable Plan (CaP)	Development of and adherence to a CaP. The CaP will confirm planned cable routeing, burial and any additional protection and will set out methods for post-installation cable monitoring. The CaP will be informed by a Cable Burial Risk Assessment (CBRA)	Risk of grounding or snagging of gear.	Secured in the Section 36 Consent and Marine Licence, via the CBRA. CBA and CaP.
EM 16	Lighting and Marking Plan (LMP)	Development of and adherence to a LMP. The LMP will detail how the final design complies with the legal requirements with regards to shipping, navigation and aviation marking and lighting.	Risk of allision with structures	Secured through commitments made in PMP5: pLMP.
EM 46	Layout plan	WTG layout plan to be consulted on with MCA and NLB prior to construction and either maintain	Risk of allision/contact with structures and ensuring access for SAR.	Secured in the Section 36 Consent and Marine Licence and the requirement for an

Reference	Embedded Mitigation Measure	Description	Justification	How it will be Secured
		regularity in lines of orientation or propose a suitable alternative layout.		Emergency Response Cooperation Plan (ERCoP).
EM 47	Cable specification and installation plan	A Cable Specification and Installation Plan will be prepared which may include consideration of issues such as Electromagnetic Interference Minimisation.	Risk of grounding or snagging of gear, and the impact on communications, radar and positioning systems.	Secured in the Section 36 Consent and Marine Licence, via the requirement for a CSIP
EM-17	Navigational Safety and Vessel Management Plan (NSVMP)	Development of and adherence to a Navigational Safety Plan (NSP). The NSP will describe measures put in place by the Applicant related to navigational safety, including information on Safety Zones, charting, construction buoyage, temporary lighting and marking, and means of notification of Proposed Offshore Development activity to other sea users (e.g., via Notice to Mariners)..	All direct impacts of the Proposed Offshore Development.	Secured through commitments made in PMP3: pNSVMP
EM 30	Emergency Response Cooperation Plan (ERCoP)	Development of, and adherence to, an Emergency Response Cooperation Plan (ERCoP) with agreement from the MCA..	Risk of impact to SAR capabilities	Secured in the Section 36 Consent and Marine Licence, via the requirement for an ERCoP
Operational Management				
EM 19	Safety Zones	Application and use of safety zones during construction/major maintenance and decommissioning phases. Safety zones shall be of appropriate configuration, extent and application to specified vessels of identified primary risk.	Risk of allision with structures or collision with construction vessels.	Secured via an application for safety zones prior to construction commencing.
EM 32	Vessel standards	All vessels working on the Proposed Offshore Development to meet the required certification standards and carriage requirements. This also includes requiring that all crew operating the vessels have the required training and qualifications under national and international regulations.	Risk of allision with structures or collision with vessels.	Secured through commitments made in PMP3: pNSVMP and national requirements for vessel standards.

Reference	Embedded Mitigation Measure	Description	Justification	How it will be Secured
EM 33	Infrastructure maintenance	Inspection and Maintenance Programme: Regular maintenance regime to check the Proposed Offshore Development infrastructure.	Minimising risk of Proposed Offshore Development asset failure.	
EM 34	International regulations	Compliance of construction and operation and maintenance Proposed Offshore Development vessels with international marine regulations as adopted by the Flag State, including the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) and the International Convention for the SOLAS (IMO, 1974).	Risk of allision with structures or collision with vessels.	Secured through national legislation incorporating international standards.

13.11 ASSESSMENT OF EFFECT SIGNIFICANCE

13-87. The likely significant effects arising from the construction, operation and maintenance and decommissioning phases of the Proposed Offshore Development are listed in **Table 13-14** along with the maximum design scenario against which each impact has been assessed. An assessment of the likely significance of the effects of the Proposed Offshore Development on the shipping and navigation receptors caused by each identified impact is given below.

13.11.1 Construction Phase

13-88. The likely significant effects during construction of the Proposed Offshore Development have been assessed for shipping and navigation. A description of the likely significant effects on shipping and navigation caused by each identified impact is given in this section for the construction phase.

13.11.1.1 Impact 1 Impact of Floating Mooring and Cable Systems on Interactions with Vessels at a Risk of Snagging

13-89. Floating offshore WTGs are typically moored to the seabed through a spread of subsurface mooring cables and chains. These moorings, can pose a risk to navigating vessels through snagging of anchors or fishing gear.

13-90. The Proposed Offshore Development description (see **Volume 1, Chapter 4: Project Description**) notes that the exact floater and corresponding mooring configuration has not been determined at the time of writing this EIAR. Therefore, the worst-case spread of 1,750 m radius moorings from each WTG has been assumed.

13-91. A second hazard relates to the potential impact of Inter-Array Cable (IAC) systems and the export cables within the ECC. These present a snagging risk to vessel anchors or fishing gear, particularly within the mooring radius of the floaters.

Magnitude of Impact

13-92. During the construction phase, the presence of partially protected cables (both export cables within the ECC and inter-array cables) during installation may increase anchor and fishing gear snagging risk. Snagging risks are considered greatest from fishing vessels when gear is deployed, particularly mobile gear types. The vessel traffic analysis undertaken as part of the NRA (see **Section 6.2.2.5 of Volume 3, Appendix 13.1: NRA**) has shown that the Study Area is used primarily by transiting vessels on route to fishing grounds outside the Array Area. Nevertheless, snagging is also possible where fixed gear fishing takes place nearshore. Although, very few vessels currently transit within the ECC in depths shallower than 20m, and the site marking and charting, in addition to promulgation of information should enable these vessels to plan around this if necessary, limiting the likelihood of a snagging incident in this area. Fishing activity present within the Study Area is detailed in **Section 6.2.2.5 of the NRA** and further information is located in **Volume 2, Chapter 11: Commercial Fisheries**.

13-93. With regard to moorings, whilst the catenary of the moorings is not known at this stage, it is likely that as distance from the WTG increases, the moorings become exponentially closer to the seabed. Therefore, the impact would be experienced where deep draught vessels navigate within proximity to the WTGs. Given that the worst-case mooring spread of 1.75 km is less than the 1 nm (1.85 km) recommended passing distance from an OWF (Rawson &

Rodgers, 2015), it is considered that the risk of a deep draught vessel contacting the moorings is remote and would be likely to contact the WTG in the same event.

13-94. Moreover, during construction, safety zones would be established of an appropriate configuration and extent to prevent fishing in particularly close proximity to the infrastructure and mitigate for potential snagging hazards, as per **Table 13-15**. In addition, promulgation of information via NtMs and the Kingfisher bulletin will increase awareness of construction activities, and the FMMCP (EM25) and the appointment of a FLO will enable discussions to take place with fishing stakeholders to further help mitigate snagging hazards during this phase. Overall, on the basis of the worst-case mooring assumptions, and the embedded mitigation measures, including safety zones (EM19) and promulgation of information (EM22), the magnitude of impact has been assessed as **Low**.

Sensitivity of Receptor

13-95. In the event that a vessel was to snag a cable, the most likely outcome is loss of gear and minor damage to the cable and/or vessel. A more severe outcome is the potential loss of the fishing vessel and fatalities, however this is considered very unlikely given the embedded mitigation measures in place (**Table 13-15)**, notably the FMMCP (EM25) that will include a FLO to aid ongoing liaison and discussions, the application and use of safety zones (EM19), to ensure sufficient space is maintained around the infrastructure, the monitoring requirements set out within the NSVMP (EM17, PMP 3: Proposed NSVMP), and the provision of an ERCoP, which would provide the SAR response to an incident and provide the actions to be taken during emergency situations (EM30). The MCA also operate an Emergency Tow Vessel (ETV) to the north and west of Scotland, until 2028, with the potential for this contract to be extended, which would reduce the likelihood of a ship casualty becoming a hazard to safe navigation in the event that a vessel snagged with WTG moorings or cable systems.

13-96. The sensitivity of the receptor has therefore been assessed as **Medium**.

Significance of Effect

13-97. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance has been assessed as minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **minor**, as opposed to moderate, given that the use of safety zones (EM19) and appropriate site charting (EM18) would reduce the likelihood of the impact and, in the unlikely event an incident occurred, the ERCoP and its associated towage provision would minimise the consequence.

Secondary Mitigation and Residual Effect

13-98. Through the NRA process, no relevant and/or proportionate further mitigation was identified, and it is concluded that this impact is ALARP.

13-99. The residual effect of the impact of floating mooring and cable systems on interactions with vessels at a risk of snagging during construction has therefore been assessed as **minor** (not significant in EIA terms).

13.11.1.2 Impact 2 Impact on commercial vessel and ferry routes

13-100. Existing commercial vessel and passenger ferry traffic could be displaced during construction due to the presence of buoyed construction areas, active safety zones, construction vessels and partially completed or pre-commissioned structures.

13-101. Detailed construction schedules and areas would be defined post-consent, but it is assumed that construction safety zones could extend 500 m beyond the Array Area and IRC Platform location. Displacement would be greatest when the Proposed Offshore Development is fully constructed (maximum footprint) which is assessed in the operation and maintenance impacts (**Section 13.11.2.2**). Displacement of vessel routes would also be greatest around the Array Area, in comparison to the IRC Area and the ECC, due to the greater presence of surface infrastructure, and hence larger safety zones. While vessels may be affected by export cable installation vessels, the export cable itself, once in site will have a negligible impact, unlike the surface piercing infrastructure of the WTGs and IRC Platform.

13-102. The obstruction and subsequent rerouting presented by windfarm construction activities therefore has the potential to result in increased journey time and distances. Impacts on routeing may in turn lead to increased allision or collision risks (**Section 13.11.2.3** and **Section 13.11.2.4**).

13-103. The construction phase was raised to be of the most concern to NorthLink during consultation due to the increase in windfarm vessel traffic that will likely transit near their main route (that runs north-south to the west of the Indicative IRC Area and Array Area), particularly traffic servicing the IRC Platform construction. This could limit the ability of vessel masters to follow their existing passage plans, particularly during adverse weather, and could require deviations to be made in these events, in order to avoid a collision or allision event.

13-104. It is noted that the impacts to international shipping routes (i.e. established commercial routes between the UK and other European ports) are reflective of the transboundary impacts of the Proposed Offshore Development given the international nature of shipping and navigation (see **Section 13.13**).

Magnitude of Impact

13-105. The three commercial vessel routes that may be displaced as a result of Proposed Offshore Development construction are of low traffic density, with only 142, 200 and 302 transits per year,. Vessel traffic density through the whole Study Area is presented in **Section 6.2.1 of the NRA (Volume 3, Appendix 13.1)** and the density of all of the key commercial routes is presented in **Section 8.3 of the NRA**. This analysis demonstrates that even the busiest of these three routes accounts for less than half the number of transits that are observed on three of the other key routes in the area, and therefore the frequency of the commercial deviations is expected to be low.

13-106. NorthLink runs two regular passenger ferry and two freight cargo services between Aberdeen and the Shetland & Orkney Islands. Their regular transits are in a north-south orientation to the west of the Array Area and Indicative IRC Area, and as a result rarely intersect the Proposed Offshore Development. While the Proposed Offshore Development vessel traffic may cause some disruption to the existing passage plan, particularly when transiting to/from the IRC Platform, following early consultation with NorthLink Ferries and

subsequent work to agree risk areas and locations, the Applicant has committed to the IRC Platform location being a minimum of 2 nm from the main Ferries route. Therefore, given the distance of the main route from the Proposed Offshore Development, the fact that NorthLink Ferries will be informed of any construction work around the platform in accordance with EM22, and the frequency with which they currently intersect the Array Area or Indicative IRC Area, these vessels are not anticipated to require regular rerouting.

13-107. Adverse weather routeing options may be reduced as a result of the Proposed Offshore Development. However, <10% of the 2023 vessel transits deviated from the typical route due to adverse weather, and less than half of these would have been impacted by the Proposed Offshore Development, therefore frequency of adverse weather route deviation is expected to be very low.

13-108. Moreover, in order to manage displacement impacts throughout the construction phase, the requirement to ensure third party vessels are aware of these project activities (EM22) and display information on charts (EM18) is embedded in the Proposed Offshore Development. This includes AtoNs and an AtoN Management Plan (EM20) which would be agreed prior to construction (see **Table 13-15**). A Proposed AtoN Management Plan is provided in PMP 4.

13-109. Overall, typical route deviations are anticipated to be experienced more than once during the Project lifecycle but by a very low number of vessels. As a result, the magnitude/frequency of occurrence has been assessed as **Low**.

Sensitivity of Receptor

13-110. The NorthLink vessel tracks suggest that their vessels typically transit 4 nm west of the Array Area and 2 nm from the westernmost point of the Indicative IRC Area. As a result, in the event that a NorthLink passenger or cargo vessel has to reroute to the west to avoid construction vessel activity, this is likely to be a small deviation (most likely < 1 nm on a 216 nm route) with a negligible (< 0.5%) increase in journey distance and time.

13-111. Other commercial vessel routes that may be displaced due to construction are on transit to/from the Pentland Firth and are likely on long-distance transits, heading to/from international ports. It is therefore possible that these vessels could make a small adjustment to their route at an earlier point in their transit in order to deviate around the Proposed Offshore Development or project vessel activity, with minimal impact on the overall journey distance.

13-112. Similarly, minimal changes to adverse weather routeing would be required as a result of the Proposed Offshore Development, with very small increases in the overall journey distance and time. Furthermore, there is substantial sea room to deviate around the obstructions.

13-113. There is adequate surrounding sea room to allow any minor deviations to typical and adverse weather routes to be undertaken safely.

13-114. As a result, the sensitivity of the receptor has been assessed as **Low**.

Significance of Effect

13-115. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance has been assessed as **Minor** (**Table 13-12**).

Secondary Mitigation and Residual Effect

13-116. As this impact has been assessed as not significant, further mitigation is not required. Nevertheless, through the NRA, the stakeholder consultation process identified an additional mitigation to ensure risk and impact to regular running ferry services remains low. This was through regular engagement with NorthLink Ferries. This engagement shall include liaison regarding the specific location of the IRC Platform, ensuring that the ferry operator is satisfied that there is sufficient sea room for collision avoidance and adverse weather routeing, and more broadly, consultation through the Proposed Offshore Development lifecycle.

13-117. Given this additional risk control should reduce the frequency of occurrence on NorthLink vessels, the overall magnitude of impact has been assessed as **Low**, with deviations expected for an even lower number of vessels. Therefore, the residual significance of effect has been assessed as **Minor**, and not significant in EIA terms.

13.11.1.3 Impact 3 Impact on Risk of Allision

13-118. The construction of any windfarm in otherwise navigable waters increases allision likelihood. During construction, a vessel is most likely to contact a windfarm structure as a result of human error or mechanical failure, which could be exacerbated by other factors such as a failure of an AtoN or adverse weather conditions, for example. The presence of new infrastructure, or partially constructed infrastructure, in the construction phase, can increase the risk that a vessel may be involved in an allision with it. Potential allision events could also arise from buoyage/markings associated with the Proposed Offshore Development, which was highlighted during stakeholder consultation meetings with both the NLB and RYA Scotland. As a result, the risk of allision will be greatest in and around the Array Area, where there will be more surface infrastructure, in comparison to the IRC Area, with just the IRC Platform, and the ECC, where there is no surface infrastructure once in situ and therefore a low allision risk.

13-119. Impacts were therefore modelled to establish the likelihood of an allision in both the Array Area and the IRC Area. The methodology for allision modelling is outlined in the NRA (**Section 8.3**). Allision impacts are considered to be greatest when the most obstructions are in situ and, given that the specific build-out schedule is undetermined at the time this assessment was undertaken, theallision modelling was therefore conducted on the basis of full build out. The full results of the modelling are therefore presented in the operational phase assessment (**Section 13.11.2.3**).

Magnitude of Impact

13-120. Analysis of historic allision incidents at existing offshore windfarms have primarily involved project vessels at low speed. Project vessels, although more likely to allide with a WTG due to their working in close proximity, are also more likely to have crew who are experienced in safely transiting offshore windfarm areas.

13-121. Allision modelling conducted for the NRA suggests that, although allision events with the IRC Platform are modelled to increase by between 53% and 84%, the modelled frequencies are still low with the highest allision frequency modelled for support vessels at 1 in 23,753 years due to large numbers of support volumes transiting past the IRC Platform on route to oil and gas fields.

13-122. While modelled allision frequencies for the Array Area are larger (the highest being for the cargo vessels, at 1 in 317 years), this is due to the high-density cargo route that runs east-west to the north of the Array Area and is still considered a low likelihood due to the lifespan of the Proposed Offshore Development.

13-123. The highest density routes do not pass close to the Array Area, and the Applicant has committed to ensure the IRC platform is located a minimum of 2 nm from the NorthLink passenger/cargo route, so the likelihood of an allision between a vessel on this route and the IRC platform is considered to be low.

13-124. In addition, this area of the North Sea has various offshore infrastructure, including multiple oil and gas fields and the Moray East and Moray West Offshore Windfarms to the southwest of the Proposed Offshore Development. As a result, vessels traversing this area are familiar with navigating around and between various types of infrastructure.

13-125. Considering the expectation is that fishing of towed gear will not continue in the Array Area at current levels during the construction phase, it is expected that the risk of allision with partially or fully constructed project infrastructure will be very low. Given the considerable distance of the Array Area from the shore, most recreational craft within the Array Study Area or IRC Study Area would be on passage around Rattray Head, and unlikely to contact a WTG during construction or the associated temporary buoyage.

13-126. During the construction phase, vessels would be less familiar with avoiding a new obstruction. Communication of construction activities and progress would be required and is embedded in the Proposed Offshore Development design through use of NtM (EM22), a Fisheries Mitigation Monitoring and Communication Plan (FMMCP) (EM25) and temporary construction buoyage (EM21) (**Table 13-15**).

13-127. Overall, the magnitude of occurrence is assessed as **Low**, reflecting the occurrence of different vessels within and operating in vicinity of the Array Study Area or IRC Study Area: oil and gas vessels and project vessels would have experience navigating close to structures; recreational vessels would be less experienced operating within a windfarm site, but rarely transit in proximity to the Array Area or IRC Area; and commercial vessels would maintain a wide berth, reducing the likelihood of allision.

Sensitivity of Receptor

13-128. Multiple factors (vessel speed, angle and the engineering of the floating foundation or platform and vessel characteristics) influence the severity of consequence should an allision occur.

13-129. Where previous incidents have occurred at existing offshore windfarms, they have primarily involved project vessels at low speed and occur due to equipment failure. The most likely outcome is, therefore, minor damage and/or minor injuries. However, it is feasible that a worst-case allision involving a larger vessel might result in WTG collapse, holing and eventual flooding of a vessel and potential loss of life, though this is considered very unlikely given the mitigation measures in place (including safety zones (EM19), and information promulgation (EM22)). An allision of a larger vessel could also damage mooring line configurations and therefore has the potential to result in partial break out. This impact is further discussed in **Section 13.11.2.13**

13-130. Various studies have sought to quantify severity of consequence (Biehl and Lehmann (2006), Besöksadress et al. (2008), Dai et al. (2013), Moulas et al. (2017) and Presencia and Shafiee (2017)). These studies indicate that:

- ship allisions, even at low speeds, can cause significant damage to WTGs including deformation and buckling;
- some studies of in-field Proposed Offshore Development vessels (up to 4,000 tons), with allisions at high speeds, did not result in WTG collapse;
- modelling of allisions with large commercial ships could result in holing of the vessels hull and cargo release;
- larger vessels (30,000 deadweight tonnes (DWT)) alliding with the WTG might typically result in the tower collapsing away from the vessel; and
- large commercial ships could result in the tower collapsing towards the vessel, with the damage likely to penetrate the deck.

13-131. With the embedded mitigations (**Table 13-15**) including the LMP (EM16) (an outline of which is provided as PMP 5), the Array Area would be well marked and there is sufficient sea room to safely pass around the site rather than through it. Therefore, it is unlikely that a small vessel, such as a recreational or fishing vessel would choose to transit through the construction site. However, were one of these vessels to allide with a WTG, given the available sea room, a glancing blow with minor damage is considered the most credible outcome.

13-132. Overall, the sensitivity of receptor has been assessed as **Medium** to reflect both the most likely and worst credible scenario.

Significance of Effect

13-133. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of allision during construction has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that smaller vessels are more likely to choose to transit through the Array Area, and the minimum WTG spacing should be sufficient for these vessels to do so safely. In the event a small vessel did allide with a WTG, light contact is most likely, and the ERCoP (EM30) and its associated towage provision would further minimise the consequence.

Secondary Mitigation and Residual Effect

13-134. Although measures included in the embedded mitigation for the Proposed Offshore Development (**Table 13-15**), particularly the promulgation of information and temporary site buoyage, will enable vessels to be able to passage plan in advance, keep a safe distance from construction activities and minimise the likelihood of an allision, through the NRA process and stakeholder consultation, an additional mitigation has been recommended (**NRA, Section 9.6**) to ensure that the risk of allision is ALARP: Regular engagement with NorthLink Ferries. This engagement shall include liaison regarding the specific location of the IRC Platform, to discuss solutions to establish appropriate searoom sea room for allision avoidance and adverse weather routeing, and more broadly, effective consultation through

the Proposed Offshore Development lifespan. The adoption of this additional risk control will minimise the likelihood of a cargo or passenger vessel alliding with the IRC Platform and ensure that the risk can be considered ALARP.

13-135. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.4 Impact 4 Impact on Risk of Collision

13-136. The construction of an offshore windfarm in an otherwise navigable area can constrain shipping routes and result in pinch points or areas of high vessel traffic density, with the potential to increase the number of encounters or potential collision situations.

13-137. The addition of project vessels associated with the construction of the Proposed Offshore Development may also increase potential encounter and collision scenarios. These vessels may cross-cut established routes to access the Array Area. The worst-case total additional movements during construction of the Proposed Offshore Development are up to 2,471 return vessel movements, with a maximum of 91 vessels (**Table 13-14**).

13-138. Blind spots may result from WTGs or the presence of large construction vessels blocking or hindering the view of other navigating vessels which could increase the risk of collision by reducing the capability for early and effective collision avoidance. The presence of a new obstruction may also result in reduced space for a vessel to take action to avoid collision or reduce the options available to do so. As a result, the risk of collision will be greatest in and around the Array Area, where there will be more surface infrastructure (obstructions), while the IRC Area just has the IRC Platform. The ECC (excluding the IRC Platform) will have no surface infrastructure once in situ and therefore a lower collision risk.

13-139. Modelling was therefore undertaken to establish the likelihood of a vessel collision occurring in both the Array Area and the IRC Area. The methodology is outlined in **Volume 3, Appendix 13.1: NRA (Section 8.4)**. It is noted that modelling assumes maximum build out of the windfarm and the most south-westerly location within the Indicative IRC Area for the IRC Platform. It is therefore expected that, during the construction phase, these return periods would be lower with collision risk considered less likely up to and following the point of full build-out.

Magnitude of Impact

13-140. Modelling results are detailed in **Volume 3, Appendix 13.1: NRA** and indicate that the frequency of collision events are low around both the Array Area and the IRC Platform, with 1 cargo vessel collision modelled for every 23,957 years and 1 passenger vessel collision modelled for every 522,332 years, as a result of the Array Area infrastructure, and 1 cargo vessel collision modelled for every 16,283 years and 1 passenger vessel collision modelled for every 233,707 years, as a result of the IRC Platform. The modelled likelihood of a collision is greatest on routes with higher vessel traffic density. An increase in the future case (with the WTGs present) collision potential is concentrated to the north and north-west of the Array Area, associated with the increased concentration of vessels on transit between Pentland Firth and Europe, as a result of commercial vessels which currently transit through the northern half of the Array Area diverting to the north and joining the existing passage across the north of the Array Area.

13-141. Given the minimum spacing of 1.42km (> 4.5 times the maximum rotor diameter) between WTGs and the density of traffic passing adjacent to the Proposed Offshore Development,

there is unlikely to be any visual block on navigational charts or shadow flicker imposed, and therefore a significant increase in risk to visual navigation and collision avoidance is not anticipated. The risks of collision associated with project vessels emerging from the Array Area would be managed through the NSVMP (EM17) which would define aspects of vessel management during the construction phase (see PMP 3: pNSVMP) to set out the measures required to mitigate marine traffic and transport-related effects resulting from the construction of the Proposed Offshore Development (**Table 13-15**).

13-142. Proposed Offshore Development construction vessel movements may interact with existing traffic, for example, when crossing shipping routes, increasing encounter potential and therefore collision risk. Risk controls would be established (as set out in the embedded mitigation listed in **Table 13-15**) to deconflict project vessel movements with other passing traffic. Coordinated passage plans for project vessels would be developed to reduce the potential impact on other traffic.

13-143. Based on the analysis, the change in collision risk over the existing baseline because of the Proposed Offshore Development is very low. Although the modelled increase in total collision frequency is 46.3% larger compared to the base case, the total frequency with the Proposed Offshore Development in situ is modelled as 1 collision event every 11,330 years, which is low considering the lifespan duration of the Proposed Offshore Development

13-144. Recreational collision risk is considered low due to the low levels of these vessel types in the Array Area and IRC Study Area. The vessel traffic surveys identified very few recreational vessels in proximity to the Proposed Offshore Development due to the distance offshore and, therefore, the increase in risk of collision would be minimal.

13-145. Analysis of historic incidents associated with UK operational windfarms identified 69 incidents between 2010 and 2019. This includes six collisions, 29 allisions, 21 groundings and 13 near misses. Of these incidents, 82% involved project craft (such as CTVs or construction vessels). There are currently no recorded accidents involving large commercial shipping and offshore windfarms in the UK, during construction.

13-146. Overall, considering the collision risk modelling results, alongside the development of the NSVMP (EM17) (particularly the management and coordination of vessel activities, passage planning, and minimum passing distance requirements for project vessels), the magnitude of impact has been assessed as **Low**.

Sensitivity of Receptor

13-147. Several international studies have explored the consequences of vessel to vessel collisions. The European Maritime Safety Agency (EMSA) (2015) collision risk model developed for their FSA based on historical incidents estimated that 33% of struck roll-on/roll-off passenger (RoPax) vessels would result in water ingress and additionally 14% of those vessels would result in sinking (resulting in a joint probability of 4.6% for a struck RoPax to sink). The Marine Safety Committee (MSC) 85-17-2 FSA gives probabilities of 16% of collisions being a serious casualty of which 50% of struck vessels would flood, 22% would sink with a further 50% split between gradual sinking or rapid capsize (joint probability of the latter being 0.8%).

13-148. Moreover, analysis of MAIB data suggests that, overall, < 1% of collisions would result in loss of life and none of the recorded navigational incidents across the UK sector associated with

UK offshore windfarms between 2010 and 2019 resulted in a fatality. As such, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-149. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of collision during construction has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor** and therefore not significant, as opposed to moderate, given that the NSVMP (EM17) will minimise the impact of project vessels on established routes, and site marking and charting (EM18) will enable advance passage planning around the construction activities themselves. The available sea room is also considered sufficient for collision avoidance if required.

Secondary Mitigation and Residual Effect

13-150. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), the passage plans secured within the NSVMP (EM17) and the site marking and charting (EM18) were considered sufficient to reduce the impact of project vessels on established routes, and enable third-party vessels to safely plan routes around the construction activities themselves if required. Therefore, no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the reduction in risk that would be achieved. As a result, this impact can be considered to be ALARP.

13-151. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.5 Impact 5 Impact on Risk of Grounding

13-152. Changes to vessel routeing as a result of export cable installation activity may lead to a potential increase in the risk of grounding. Given the distance offshore of the Array Area and Indicative IRC Area, water depths are in excess of 70m in and around the Array Area in excess of 60 m around the IRC Area and, therefore, any route deviations required because of the surface-piercing infrastructure will not be at an increased risk of grounding. However, nearer landfall, the installation of the export cables could impact the risk of grounding by causing vessels to deviate closer to shore, where water depths are shallower.

Magnitude of Impact

13-153. Analysis of vessel draughts within the Array Area (**Section 8.2 of the NRA**) demonstrates that the majority (> 92%) of vessels (where the draught is known) are less than 10 m in draught.

13-154. Very few vessels with a draught >6 m currently transit within 3 nm of the landfall. Within the 2023 AIS data used in to define the baseline environment, the closest observed vessel with draught over 6m was transiting 1.5 nm away from the landfall where the depth exceeds 22 m. Furthermore, there is considerable sea room and water depths either side of the ECC, further away from landfall, and therefore the risk of grounding is not expected to be significantly increased due to the Proposed Offshore Development. However, while unlikely, it is possible that a cable-laying vessel with a draught > 6 m could ground during export cable installation, although this would be considered an incident associated with the Proposed Offshore Development, as opposed to an incident occurring to a third-party vessel as a result of the Proposed Offshore Development.

13-155. Embedded mitigation measures detailed in **Table 13-15**, including cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as the obtainment of detailed seabed data through periodic hydrographic surveys (EM29) should ensure that the cable laying vessel is not expected to operate in water depths which are too shallow, in order to reduce the risk of grounding. This should limit the need for vessels to deviate around the nearshore ECC and, therefore, reduce the risk of them transiting closer to shore and grounding on the seabed.

13-156. As a result, the magnitude of impact has been assessed as **Low.**

Sensitivity of Receptor

13-157. In the unlikely event of a grounding, the most likely outcome is minor injuries and minor adverse publicity. However, while very unlikely, the worst-case scenario could involve loss of small craft, with a single fatality.

13-158. As a result, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-159. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of grounding during construction has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor** and not significant, as opposed to moderate, given that the management and coordination of vessel activities secured within the NSVMP (EM17) will reduce the impact of project vessels on established routes, thus mitigating the likelihood of transiting vessels deviating near to the landfall and grounding on the seabed close to shore, and the low likelihood of fatal consequences should a grounding event occur.

Secondary Mitigation and Residual Effect

13-160. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

13-161. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.6 Impact 6 Impact of Towage Operations

13-162. There will be significant towage operations required for the Proposed Offshore Development throughout the construction phase as WTGs are taken to and from the Array Area. These operations may require up to four offshore tugs to operate with the tow, resulting in vessels being Restricted in Ability to Manoeuvre (RAM). These operations have potential to affect collision on passage; however the construction ports have not been determined so the route taken is not known. The towage operations will however be focused around the Array Area and so it is possible to consider the effects on vessel traffic in the vicinity. The greatest potential for interactions with vessel routeing is if the tow is on a coastal route following the current traffic routeing or crossing it to reach the Array Area.

13-163. Through consideration of the baseline traffic distribution that has been considered within the collision modelling (see **Section 13.11.2.4.**) The current likelihood of a collision or allision is

low in the study area. There is also sufficient searoom for other vessels to be able to identify the towage operation and act accordingly.

Magnitude of Impact

13-164. There are multiple embedded mitigation measures for towage operations detailed in **Table 13-15**, such as requirements for towage contractors to undertake Risk Assessment Method Statements (RAMS) for the operation. The RAMS consider each specific operation to identify areas of potential risk such as vessel traffic, weather conditions and assign appropriate measures such as abort points and limitations. This is further controlled by the NSVMP (EM17) which will prescribe the requirements for Proposed Offshore Development vessel passage planning, securing the management and coordination of vessel activities, as well as communications and reporting requirements.

13-165. As a result, the magnitude of impact has been assessed as **Low.**

Sensitivity of Receptor

13-166. In the event that the towage operations impact passing vessel traffic, the most likely outcome is the vessels being RAM and experiencing minor delays on their route. While a worst-case scenario could involve vessel collision, with a fatality, this is considered very unlikely given the embedded mitigation measures highlighted above.

13-167. As a result, the sensitivity of the receptor has been assessed as **Low**.

Significance of Effect

13-168. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact of towage operations during construction has been assessed as **Minor** and not significant (**Table 13-12**)**.**

Secondary Mitigation and Residual Effect

13-169. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

13-170. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.7 Impact 7 Impact on Search and Rescue Capabilities

13-171. Construction traffic would lead to an increased number of vessels and personnel in the Study Area, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures.

13-172. In the unlikely event of an incident, SAR assets are required to access the site or surrounding area without risk to themselves. In particular, WTGs can pose a hazard to SAR helicopters and, therefore, the design of the windfarm should be such to enable helicopter access safeguarding HM Coastguard obligations within the UK SAR Region. An ERCoP is required and embedded in Proposed Offshore Development (EM30; **Table 13-15**) to facilitate information sharing regarding the OWF and SAR organisations. By establishing these clear communication and coordination protocols, the ERCoP will ensure that any SAR helicopters

are aware of any potential hazards and have a plan in place for responding to incidents, reducing the likelihood of a helicopter allision.

Magnitude of Impact

13-173. Existing incident rates are considered low in the Study Area based on the data studied within the NRA. An assessment of the impact of the Proposed Offshore Development on the likelihood of collision and allision for vessels during construction (**Section 13.11.1.4** and **Section 13.11.1.3**) showed these are considered unlikely, which is due to the generally low levels of vessel traffic in the Study Area. Therefore, it is not anticipated that the Proposed Offshore Development would notably increase the observed existing incident rates, and consequently the likelihood of requiring SAR in the Array Area is relatively low.

13-174. The Proposed Offshore Development has also committed to two lines of orientation to facilitate SAR access and the minimum spacing between the WTGs will be 1.42 km and, therefore, helicopter access guidance is met.

13-175. Although specific layouts are subject to detailed studies at a later date than when the EIA is conducted, the layout design will follow the requirements of the OREI SAR Requirements v4 (MGN 654 Annex 5) (MCA, 2024) and will be consulted on with MCA and NLB prior to construction (EM46), in order to ensure that access of SAR assets is not compromised and confirm that principals contained in MGN 654 Annex 5 are followed.

13-176. Given the embedded mitigations (**Table 13-15**) that act to minimise the likelihood of incidents, and therefore the need for SAR, the magnitude of impact has been assessed as **Negligible**.

Sensitivity of Receptor

13-177. Several trials have been conducted by HMCG and MCA in SAR at OWFs (see MCA, 2005; 2019). They found that searching within an OWF is more complex than in open sea and there may be a delay for entry into an OWF whilst the crew familiarise themselves with the site and layouts. During poor visibility, the importance of linear SAR lanes of sufficient width was identified as of significant importance. When transiting through an OWF, all communications and navigation equipment was reported to be operating successfully with WTGs identifiable through radar. Unfamiliarity with transiting and winching in vicinity of WTGs results in slower speeds and delays, which increases fuel consumption and may make searches less effective. Concerns have also been raised regarding visual identification of casualties, as WTGs block the view, particularly during rough weather.

13-178. However, it should be considered that the on-site presence of Proposed Offshore Development construction vessels would form additional resource to respond to any incidents in the area in liaison with the MCA, both in terms of incidents associated with the Proposed Offshore Development (i.e. self-help resources), but also incidents occurring to third party vessels outside of the Proposed Offshore Development site.

13-179. In addition, as required under MGN654, an ERCoP would be produced and submitted to the MCA detailing how the Project vessels would cooperate and assist in the event of an incident (EM30). The ERCoP would also establish clear communication and coordination protocols, thereby ensuring that any SAR helicopters and project vessels are aware of any potential hazards and have a plan in place for responding to incidents, reducing the likelihood of

further incident during rescue. The principles of SAR access for OWFs are contained in MGN654, Annex 5.

13-180. As a result, the sensitivity of the receptor has been assessed as **Low**, given the embedded mitigations and minimum spacing between WTGs that will allow SAR operations to be undertaken if required.

Significance of Effect

13-181. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on SAR capabilities during construction has been assessed as Negligible/Minor (**Table 13-12**)**.**The significance of effect for this impact is considered to be **Negligible**, and not significant, as opposed to Minor, given that, while unlikely, should an incident occur in proximity to the Proposed Offshore Development, the project vessels are likely to be nearby and therefore be the first response vessel, further reducing the impact on SAR requirement.

Secondary Mitigation and Residual Effect

13-182. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-183. The residual effect has therefore been assessed as **Negligible** (not significant in EIA terms).

13.11.1.8 Impact 8 Impact on Communications, Radar and Positioning Systems

13-184. Windfarm sites may adversely impact equipment used for navigation, collision avoidance or communications. The sound generated by the WTGs could additionally mask navigational sound signals from vessels or aids to navigation.

13-185. It is noted that the Proposed Offshore Development sits outside of all port limits, VTS and pilotage areas and therefore whilst shore-based radar may have partial coverage of the Array Area, it would not be actively monitored. Therefore, the presence of the Proposed Offshore Development would not compromise vessel traffic monitoring obligations.

13-186. Equipment that may be adversely impacted within the different sections of the Study Area is discussed below:

- Array Area:
    - Very High Frequency (VHF): VHF is essential for communication between vessels and the shore and could be blocked by the presence of WTGs;
    - AIS: AIS enhances the identification between vessels for collision avoidance. AIS signal could be blocked or interfered with by the presence of WTGs;
    - Global Navigation Satellite System (GNSS): GNSS (such as Global Positioning Systems (GPS)) is used for satellite positioning systems and navigation. Satellite reception could be impacted by the presence of WTGs;

- Marine radar: Marine radar is used for both collision avoidance and vessel navigation. WTGs, like other structures, can result in spurious returns such as side lobes, echoes, reflections and blanketing;
- Shore radar: Similar to marine radars, shore radars could be impacted by the WTGs;
- Magnetic compass: Compasses are used for vessel navigation. These are potentially impacted by electromagnetic interference from the WTGs. The degree of this impact is related to the depth of water, cable design and alignment with the earth's magnetic field; and
- Noise: The sound generated by the WTGs could mask navigational sound signals from vessels or aids to navigation.

- Export Cable Corridor:
  - Magnetic compass: Compasses are used for vessel navigation. These are potentially impacted by electromagnetic interference from the cables. The degree of this impact is related to the depth of water, cable design and alignment with the earth's magnetic field.
- IRC Area:
  - Magnetic compass: Compasses are used for vessel navigation. These are potentially impacted by electromagnetic interference from the cables passing through the IRC Platform. The degree of this impact is related to the depth of water, cable design and alignment with the earth's magnetic field.

13-187. A significant body of work has been conducted to examine these impacts in detail within the wider industry, and reference is made to the following studies:

- MCA and QinetiQ (2004). Results of the electromagnetic investigations and assessments of marine radar, communications and positioning systems undertaken at the North Hoyle windfarm by QinetiQ and the MCA;
- British Wind Energy Association (BWEA) (2007). Investigation of Technical and Operational Effects on Marine Radar Close to Kentish Flats Offshore Windfarm; and
- Ocean Studies Board's Division on Earth and Life Studies. W Generator Impacts to Marine Vessel Radar (National Academies, 2022).

Magnitude of Impact

13-188. A lot of the communication equipment that could be adversely impacted by the presence of the WTGs and cables (including AIS, radar, and GNSS) will be used by vessels frequently transiting in proximity to the Array Area. However, not all of these vessels will experience these impacts given that vessels can use different technologies, and transit at different distances from the structures. As a result, the magnitude of impact has been assessed as **Medium.**

Sensitivity of Receptor

13-189. The 2004 QinetiQ study found no noticeable impact on AIS reception or VHF communications both ship-shore and ship-ship within or adjacent to the windfarm. A trial aboard SAR helicopters (MCA, 2005) also determined no significant impact on VHF direction finding capabilities. Similarly, the QinetiQ study found no noticeable impact on GPS reception, even in very close proximity to the WTGs.

13-190. In addition, the potential impacts on marine radar were studied extensively in both the QinetiQ (2004) and BWEA (2006) studies. Both studies determined that the reduced capability to track small vessels within OWFs and the risk of losing acquired targets should be considered by mariners navigating adjacent to OWFs. It is common practice that some of these impacts are able to be lessened by the vessel bridge team by careful adjustment of radar controls, such as Gain. Based on this, the MCA developed a shipping route template (MGN654) that placed the extent of these effects at 1.5 nm, increasing as the vessels transit closer to the WTGs. Intolerable impacts may be experienced up to 0.5 nm from the OWF. Historical evidence suggests that most vessels pass more than 0.5 nm from an OWF and therefore these effects are lessened. Adjacent to the Array Area, the density of traffic is relatively low and there are few other navigational hazards, enabling vessels to transit 1.5 nm from the Array Area. Furthermore, it is likely that most vessels this far offshore would have AIS fitted to mitigate some of these impacts. Due to the Array Area being over 40 nm offshore, it is also well clear of any ports and harbours, and any VTS coverage. Therefore, no appreciable impact on marine or shore radar for managing navigational safety is anticipated.

13-191. Whilst WTGs make an audible sound whilst rotating, the low density of shipping and distance to other navigational marks make this potential impact Negligible. In addition, maritime regulations for the audibility of a ship's whistle are well in excess of the typical WTG sound emissions even at very close range, with the sound level from a wind farm at a distance of 350m estimated to be 35-45 dB (U.S Department of Energy, 2008) and a ship's whistle for a vessel of between 75m and 200m required to generate in the order of 138 dB and be audible at a range of 1.5nm, as per Annex III of the 1972 Collision Regulations (COLREGS), so these should be heard above the background noise of the site.

13-192. Given the findings of these studies, no appreciable impacts on navigation safety are anticipated from any of these effects. All these impacts are also only caused due to the presence of WTGs (primarily due to the blade movement and the reflective nature of the WTGs) and are therefore restricted to the Array Area alone and are unlikely to be caused by the presence of the export cables or the IRC Platform.

13-193. Compasses used for vessel navigation are potentially impacted by electromagnetic interference from the export cables, as well as the WTGs. The degree of this impact is related to the depth of water, cable type and design and alignment with the earth's magnetic field. For instance, high voltage alternating current (HVAC) cables generate alternating magnetic fields due to the constantly reversing current, which can interfere with magnetic compasses. Whereas, high voltage direct current (HVDC) cables produce a static magnetic field. Although HVDC cables have the potential to cause permanent or semi-permanent deviation in magnetic compasses if vessels operate close to the cable, the impact is generally more predictable and stable compared to HVAC cables, and often easier to correct for with compass deviation cards

13-194. Therefore, whilst it is possible that vessel compasses, particularly on small vessels, could be impacted near to cable landfall, the impact is considered less disruptive and more predictable given that the Proposed Offshore Development consists of HVDC cables. Moreover, it is considered likely that small craft would navigate visually near to cable landfall and therefore the impact on navigation safety is reduced. In addition, burial of the cables where possible (EM9) will reduce the exposure to surface vessels, and warnings of possible compass interference in areas where cables are shallow can be promulgated via NtMs (EM22) to further reduce the impact. The Cable specification and installation plan set out as an embedded mitigation within **Table 13-15** will also consider issues including Electromagnetic Interference Minimisation, as applicable. Therefore, no appreciable impact on navigation safety from electromagnetic interference is anticipated.

13-195. Overall, the sensitivity of the receptor has been assessed as **Negligible**.

Significance of Effect

13-196. Overall, with the magnitude of impact assessed as **Medium,** and the sensitivity of the receptor assessed as **Negligible,** the overall effect significance of the impact on communication systems during construction has been assessed as **Minor** (**Table 13-12**) and not significant**.**

Secondary Mitigation and Residual Effect

13-197. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-198. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.9 Impact 9: Impact on Under Keel Clearance due to Subsurface Infrastructure

13-199. Although cable burial (the Proposed Offshore Development has a target burial depth of 1.5 m) mitigates the risk of snagging post-construction, and the Cable Plan (EM9) will be informed by a CBRA to ensure these risks are adequately addressed for the types of gear used within the ECC Study Area, in some areas, cable burial may not be practicable, and they must be protected by other means, such as standard rock berm/concrete mattresses. For instance, in the nearshore, cable protection may be installed using a standard rock berm creating long linear berm of circa 9 km (KP 1.94 to KP 11) that is perpendicular to the shore. Where this is the case, the depth of water may be reduced, alongside the Under Keel Clearance (UKC) of vessels. The MCA and RYA recommend that any protection should not reduce the depth of water (referenced to Chart Datum) by more than 5%.

Magnitude of Impact

13-200. Given the distance offshore, the Array Study Area sits within water depths in excess of 73 m. The maximum height of inter-array cable protection within the MDS is 1.5 m, and therefore, reduces the water depth by a maximum of 2.1%, so the impact of inter-array cables on UKC is negligible and acceptable according to the MCA and RYA recommendations.

13-201. However, the maximum height of export cable protection within the MDS is 1.8 m and would therefore reduce the water depth by 5% in any regions where the depth of waters is

less than 36 m, which accounts for initial 3 nm of the cable corridor from landfall. However, very few vessels with a draught >6 m were identified to transit within 3 nm of the landfall, with the closest vessel to shore recorded 1.5 nm away, where the reduction in water depth could be up to 8%. Nevertheless, there is sufficient sea-room north of the landfall for vessels to transit further away from the landfall, with depths exceeding 36 m, in line with MCA and RYA recommendations..

13-202. As a result, the magnitude of impact has been assessed to be **Low**.

Sensitivity of Receptor

13-203. In the event of a significant reduction in UKC, and a vessel snagging on export cable protection, the outcome could vary from a dramatic reduction in vessel speed to a sudden shift in weight or damage to the hull which could lead to capsize in a worst-case scenario.

13-204. The most likely outcome involves a reduction in speed, and temporary movement limitation in the case of small vessels, and therefore consists of minor injuries, minor vessel damage and minor adverse publicity.

13-205. The worst credible outcome of a vessel flooding and/or capsizing as a result of snagging on cable protection is considered to involve a single fatality, loss of small craft and minor pollution, although this is considered very unlikely given the marking and charting of the site (EM18), the use of safety zones (EM19), the sea room available around the ECC, and the development of an ERCoP (EM30).

13-206. Overall, taking this into account, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-207. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact of subsurface infrastructure on UKC during construction has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development) will provide the actions to be taken during emergency situations (EM30) that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable protection if required.

Secondary Mitigation and Residual Effect

13-208. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-209. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.10 Impact 10: Impact on Access to Ports and Harbours

13-210. It is noted that access to local ports may be affected by the construction operations associated with the Proposed Offshore Development, due to construction taking place in the

vicinity of the port or due to Project vessel operations to/from a port affecting the vessel traffic management in the area.

13-211. The nearest ports that could potentially be affected by construction activities are Fraserburgh and Peterhead, as they are located 6.2 nm and 4.6 nm north and south of the ECC landfall, respectively.

Magnitude of Impact

13-212. Based on the distance offshore of the Array Area and Indicative IRC Area (in excess of 40 nm and 18 nm, respectively) from the closest ports, there will be no interference with vessels approaching or leaving the port, or obstruct the access to it. There is therefore considered to be no impact from any construction/installation activities in the Array Area or IRC Area on port access.

13-213. Vessel loitering (>10 hours/year) associated with the Port of Peterhead occurs south of the ECC, although some loitering does extend far enough north to be located near the cable landfall. This means that there is potential for interaction between these vessels and vessels associated with the export cable installation. Moreover, over half the traffic entering/leaving the Port of Peterhead does so from/to the eastern/southern side of the ECC and would likely not have any interaction with the cable activities.

13-214. Limited loitering activity is associated with the Port of Fraserburgh, further north, as this is largely a recreational and fishing port. Although more of the traffic entering Fraserburgh crosses the ECC, the distance from the port reduces any likelihood of impact, and means there is sufficient sea room for any small diversions, if necessary, as a result of construction vessels.

13-215. In addition, vessels associated with the construction of the Proposed Offshore Development are not anticipated to notably increase overall baseline traffic levels in the area, with a maximum of 10 vessels operating at any one time for construction of the export cable with an expected 139 return transits as part of the construction activities. Marine coordination and vessel procedures will be in place to manage Proposed Offshore Development vessel movements and reduce disruption to third-party vessels as per the pMP 3 Proposed NSVMP (EM17). As such, no notable impact on port access is expected from the construction vessels, noting any interactions with third party vessels would be managed via COLREGS, in addition to the marine coordination procedures, secured within the NSVMP (EM17).

13-216. Given the >6 nm distance of the cable landfall from the ports, the amount of loitering associated with either port, and the embedded mitigation measures that ensure management of project vessels, the magnitude of impact on access to the ports is assessed to be **Low**.

Sensitivity of Receptor

13-217. Given that the amount of disruption that would likely be experienced in the event that access is impacted would likely be short term and localised, impacts are anticipated to have limited consequence.

13-218. Moreover, the unrestricted sea room either side of the ECC, promulgation of information and notices, as committed to in **Table 13-15**, and the coordination between parties (as

secured within the NSVMP) can all serve to deconflict these operations. As a result, the severity of consequence is considered to be **Low**.

Significance of Effect

13-219. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on access to ports and harbours during construction has been assessed as **Minor** (**Table 13-12**) and not significant**.**

Secondary Mitigation and Residual Effect

13-220. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-221. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.11 Impact 11: Impact on Commercial Fishing Safety

13-222. Fishing vessel activity throughout the Study Area is presented in **Volume 3, Appendix 13.1: NRA** and further information is located in **Volume 2, Chapter 11: Commercial Fisheries**. During the Proposed Offshore Development construction, commercial fisheries may be at risk of gear snagging, route displacement or a collision or allision event. This could be in response to installation activities and/or the physical presence of partially constructed infrastructure. The assessment of commercial impacts on reduced fishing activity is not considered here and is set out in **Volume 2 Chapter 11: Commercial Fisheries**.

Magnitude of Impact

13-223. During the construction phase, the presence of partially protected cables during installation may increase anchor and fishing gear snagging risk in these discrete areas. During construction, it is required in the Proposed Offshore Development embedded mitigation that safety zones would be established of an appropriate configuration and extent to mitigate for potential snagging hazards (EM19). Local sea users will also be made aware of the construction activities and any partially protected cables via NtMs or via the Kingfisher bulletin (EM22).

13-224. Moreover, as part of the NSVMP (EM17), guard vessels may be used where applicable to ensure adherence with safety zones or advisory passing distances to mitigate impacts which pose a gear snagging risk during construction.

13-225. Some fishing vessels, particularly those that fish in proximity to the ECC, may also experience temporary displacement into areas with more heavy traffic as a result of cable installation activity. However, this activity should be short-term, and the available sea room should be sufficient for deviations to alternative fishing grounds be undertaken safely.

13-226. As a result, taking into account these embedded mitigation measures and the fact that construction are only short-term, the magnitude of impact is assessed as **Low**.

Sensitivity of Receptor

13-227. Most of the commercial fishing vessels observed within the Array Area are on transit to fishing grounds outside the Array Area and are not actively engaged in fishing. The sea room

available around the safety zone is also considered sufficient to enable safe displacement around the Array Area. As construction progresses and construction of the Array Area approaches operation, it is expected that fishing activity is unlikely to occur within the Array Area, and the commercial impacts of this are considered in **Volume 2, Chapter 11: Commercial Fisheries.**

13-228. The production of a Fisheries Mitigation Monitoring and Communication Plan (FMMCP) (EM25) details the approach to ongoing fisheries liaison through construction to reduce effects on commercial fishing vessel safety, where practicable.

13-229. Moreover, the risk of a fishing vessel snagging on the export cable or cable protection was considered and scored within the NRA (**Volume 3, Appendix 13.1**). Snagging of the cable by fishing vessels is unlikely given the low anchoring frequency within the export cable corridor (see **Section 6.2.2.5 of the NRA**) and, although a worst credible outcome was considered to involve the loss of the fishing vessel and a single fatality, due to the low consequences of the most likely scenario, and minimal environmental impact, the hazard was given a low overall risk score of 4.4, which was agreed with all stakeholders following the Hazard Workshop. Furthermore, through the NRA, this scenario is considered highly unlikely with the application of the embedded mitigation measures, including safety zones (EM19), FMMCP (EM25), and the Cable Plan (EM9).

13-230. Considering the mitigation measures embedded in the Proposed Offshore Development and the unlikely potential for fatalities, the overall sensitivity of the receptor is assessed as being **Medium**.

Significance of Effect

13-231. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact on commercial fishing safety during construction has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that, while very unlikely, should a fishing vessel snag on a cable, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

Secondary Mitigation and Residual Effect

13-232. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-233. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.12 Impact 12: Impact on Recreational Vessel Safety

13-234. Recreational activity throughout the Study Area is presented within the NRA. During the Proposed Offshore Development construction, recreational vessel users may be at risk of route displacement, grounding, or a collision or allision event. This could be in response to project vessel traffic, installation activities and/or the physical presence of partially

constructed surface and subsurface infrastructure. The recreational activity in the study area is concentrated close to the coast with limited transits through the array area. This means that potential interactions with construction activities will be in this area. The ports to be used for construction activities are not yet determined however, there is potential for construction vessels to be crossing or transiting along the routes used by recreational vessels. There is a limited period in which the construction activities will be in this area primarily for installation of the export cable close to shore and the searoom available to effectively take action as necessary.

Magnitude of Impact

13-235. During the construction phase, the presence of a partially constructed wind farm and IRC Platform may increase the likelihood of an allision with either a WTG or the IRC Platform. However, given the low density of recreational vessels as far offshore as the Array Area and even the IRC Area, and embedded mitigations including temporary construction buoyage (EM21), an allision is unlikely.

13-236. Impacts to recreational vessels are considered more likely where there is a higher density of recreational activity. Generally, recreational vessels try to avoid the large oil and gas infrastructure and the more weather-exposed areas, and therefore stay closer to shore. As a result, it is noted that recreational vessels may be displaced from their current routes around Rattray Head due to the presence of project vessels and partially protected cables. Nevertheless, there is sufficient sea room to enable recreational vessels to deviate around construction activity, and embedded mitigation measures including promulgation of information (EM22) will ensure that recreational vessels are aware of any construction activity happening.

13-237. Another potential impact to recreational vessels is the possibility for construction vessels to cut across the key recreational vessel course, between Fraserburgh and Peterhead, when on transit to the Array Area or IRC Platform, increasing the risk of a collision between a recreational vessel and a construction vessel. However, risk controls would be established (as set out in the embedded mitigation listed in **Table 13-15**) to deconflict construction vessel movements with other passing traffic. Passage plans would be developed to minimise the potential impact on other traffic as per PMP 3: Proposed NSVMP (EM17).

13-238. Moreover, although the installation of the export cable could increase the risk of recreational vessel grounding by reducing the water depth, there is considerable sea room and water depths around the ECC, further away from landfall, and therefore the risk of grounding is not expected to be significantly increased due to the Proposed Offshore Development. It is also noted that recreational craft currently tend to stay slightly further out from the shore, similar to passenger tracks, due to waves that can be generated by certain wind and tidal conditions near Rattray Head, so grounding of these vessels is unlikely.

13-239. As a result, with the embedded mitigation measures in place, impact to recreational activity is expected to be unlikely during construction, so the magnitude of impact is assessed as **Low**.

Sensitivity of Receptor

13-240. Most of the recreational vessels observed within the Study Area are on transit around Rattray Head, between Peterhead and Fraserburgh. Therefore, construction activity within

the Array Area is not considered likely to have a significant impact on recreational vessel users. If recreational vessels did want to transit through the Array Area on passage to other ports, there is still sufficient sea room around the safety zone to enable deviation, so little impact is expected.

13-241. Regarding the area immediately adjacent to landfall, where cable protection within the ECC might compromise UKC and increase the risk of grounding of recreational vessels, this hazard was identified and assessed in **Volume 3, Appendix 13.1: NRA.** This hazard is unlikely given that few smaller craft navigate close to the shore and, although a worst credible outcome was considered to involve the loss of the recreational vessel and a single fatality, due to the low consequences of the most likely scenario, and minimal environmental impact, the hazard was given a low overall risk score of 4.7, which was agreed with all stakeholders following the Hazard Workshop. Furthermore, through the NRA, both scenarios are considered very unlikely with the embedded mitigations in place. The promulgation of information via NtMs (EM22), and the notification of the UKHO and standard list of stakeholders as to the progress of the construction of the Project (i.e. the status of infrastructure associated with the Project), will enable recreational vessels to effectively passage plan in advance to reduce the risk of grounding. The ERCoP (EM30) will also provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

13-242. The overall sensitivity of the receptor is therefore assessed as being **Medium**.

Significance of Effect

13-243. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact on recreational vessel activity during construction has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is assessed to be **Minor**, and not significant, as opposed to moderate, considering that a snagging incident is very unlikely given the limited recreational activity around the Array Area and the IRC Area and that, should a recreational vessel snag on a cable, the ERCoP (embedded within the Proposed Offshore Development) (EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

Secondary Mitigation and Residual Effect

13-244. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of the Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-245. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.1.13 Impact 13: Impact of WTG Breakout on Vessel Safety

13-246. WTGs will be installed in the Array Area at different times throughout construction, such that there will be times where some WTGs are already installed, while others are still undergoing construction. As a result, were the completed WTG moorings to partially or

completely fail, it is possible that a WTG could become displaced from its position or break free and become a navigational hazard to vessels.

13-247. WTG blade breakout is also possible in adverse conditions and was raised during consultation.

13-248. The moorings will be subject to the requirement of the Regulatory expectations on moorings for floating wind and marine devices (HSE/MCA, 2017) (EM31), which dictates that the mooring systems should be designed to resist such forces acting on it as are reasonably foreseeable conditions.

13-249. These requirements also mandate that the installation will be subject to the Construction (Design and Maintenance) Regulations 2015 which requires risks to be managed by the application of the principles of prevention.

Magnitude of Impact

13-250. The Proposed Offshore Development is using up to nine moorings per floater, reducing the likelihood of a WTG moving position in the event that one mooring line does fail. Taking this into account, alongside the requirements to which the moorings are initially subject to (EM31), that dictates that there must be also be a provision for the continuous monitoring of the floating wind or marine device that could alert a remote monitoring centre in case of mooring failure, WTG (or partial) WTG breakout is considered to be very unlikely, and the magnitude of impact is therefore assessed to be **Negligible**.

Sensitivity of Receptor

13-251. Were the WTGs to break out, they will still be marked and visible to other navigating vessels in accordance with the LMP (EM16) and a response plan will be included within the ERCoP (EM30) with additional measures such as failure warning measures and tracking devices as well as response and recovery procedures. These measures will assist other navigating vessels to identify and avoid the hazard.

13-252. Given the relatively low density of traffic, and continued visibility of the WTG were it to break out, the severity of consequence of WTG break out is Medium, given that there is still a low likelihood of collision and/or allision. However, it is noted that, were a blade to fail/breakout, the visibility of the hazard would be reduced and the risk of an allision and major vessel damage is increased. Taking this potential into account, the sensitivity of the receptor is assessed to be **High**.

Significance of Effect

13-253. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **High,** the overall effect significance of the impact of WTG breakout on vessel activity during construction has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is assessed to be **Minor**, and not significant, as opposed to moderate, considering that a WTG breakout is very unlikely given the proposed number of mooring lines and requirements they must comply with. Furthermore, should a WTG breakout, it's visibility should minimise the risk of allision and the ERCoP (EM30, embedded within the Proposed Offshore Development) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of a breakout, by

ensuring the WTG (or blade) could be towed away from passing traffic once the breakout has been reported. Overall, the significance of effect is assessed to be **Minor.**

Secondary Mitigation and Residual Effect

13-254. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-255. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2 Operation and Maintenance Phase

13-256. The likely significant effects of the Proposed Offshore Development operation and maintenance on shipping and navigation caused by each identified impact are assessed and summarised in this section.

13.11.2.1 Impact 14 Impact of Floating Mooring and Cable Systems and Interactions with Vessels at a Risk of Snagging

13-257. Floating offshore WTGs are typically moored to the seabed through a spread of subsurface mooring cables and chains. These moorings, or transmission cabling, can pose a risk to navigating vessels through snagging of anchors or fishing gear.

13-258. The Proposed Offshore Development design scenario (see **Volume 1, Chapter 4: Project Description**) notes that the exact floater and SKS scenario (and corresponding mooring configuration) has not been determined at the time of the EIA. Therefore, the worst-case spread of 1,750 m radius moorings from each WTG has been assumed.

13-259. A second hazard relates to the impact of cable systems. Cabling (within the Array Area) would comprise both inter-array and interconnector cables. These can pose a risk to navigating vessels by presenting a snagging risk to vessel anchors or fishing gear.

Magnitude of Impact

13-260. The magnitude of impact is expected to be similar to that during the construction phases of the Proposed Offshore Development (**Section 13.11.1.1**). However, throughout the operational and maintenance phase of the Proposed Offshore Development, vessel masters should be more familiar with the location of cables, which would also be charted (EM18), further reducing the likelihood of a snagging incident. Nevertheless, snagging is also possible where fixed gear fishing takes place further nearshore. Similar to construction, any maintenance works required would be communicated with local sea users, including the fishing community, in accordance with the embedded mitigation measures outlined in **Table 13-15**.

13-261. Cable burial and adequate protection would mitigate the risk of snagging once burial is complete. The requirement for a cable burial risk assessment is an embedded mitigation (EM9, **Table 13-15**) for the Proposed Offshore Development to ensure these risks are adequately addressed for the types of gear used within the Study Area. As such, with embedded mitigation measures in place, snagging is expected to be extremely unlikely.

13-262. Overall, on the basis of the worst-case mooring assumptions, and the embedded mitigation measures, the magnitude of impact has been assessed as **Low**.

Sensitivity of Receptor

13-263. In the event that a vessel were to snag a cable, the most likely outcome is loss of gear and minor damage to the cable. A more severe credible outcome is the potential loss of the fishing vessel and fatalities however, this is considered very unlikely, given the embedded mitigation measures in place.The FMMCP (EM25)will include a FLO to aid ongoing liaison and discussions, and the provision of an ERCoP (EM30), will provide the actions to be taken during emergency situations, reducing the likelihood of a ship casualty becoming a hazard to safe navigation in the event that a vessel snagged with WTG moorings or cable systems. The MCA also operate an ETV to the north and west of Scotland, until 2028, with the potential for this contract to be extended, which could further mitigate the consequence.. Therefore, given how unlikely a fatality is as a result of a vessel snagging on cables or moorings, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-264. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that the site charting (EM18) and FMMCP (EM25) would minimise the likelihood of the impact and, in the unlikely event an incident occurred, the ERCoP (EM30) and its associated towage provision would minimise the consequence.

Secondary Mitigation and Residual Effect

13-265. Through the NRA process, no relevant and/or proportionate further mitigation was identified, and it is concluded that this impact is ALARP.

13-266. The residual effect of the impact of floating mooring and cable systems on interactions with vessels at a risk of snagging during operation and maintenance has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.2 Impact 15 Impact on Commercial and Ferry Routes

13-267. Offshore windfarms can impact vessel routeing by creating an obstruction in otherwise navigable waters and therefore requiring deviation of vessel routes. Impacts on routeing are considered greatest during the operational phase when the windfarm is fully built-out (maximum footprint) and IRC Platform is complete.

13-268. The obstruction and subsequent rerouting presented by the windfarm has the potential to result in increased journey times and costs. Impacts on routeing may in turn lead to increased allision or collision risks (**Section 13.11.2.3** and **Section 13.11.2.4**)

Magnitude of Impact

Although the full build out of the Proposed Offshore Development may require slightly longer deviations than during the construction phase described in **Section 13.11.1.2**, the overall magnitude of impact is still considered very similar, as the number of affected transits will most likely be the same. Therefore, given the similar level of impact to typical and adverse weather routeing as during construction, and the same embedded mitigation

measures including an AtoN management plan (EM20, see the Proposed AtoN Management Plan PMP 4) and promulgation of information (EM22), the magnitude/frequency of occurrence has been assessed as **Low**, with deviations experienced more than once during the Project lifecycle, albeit to a very low number of vessels.

Sensitivity of Receptor

13-269. Passenger and commercial vessels are likely to reroute to avoid the Array Area and any maintenance vessel activity in much the same way as they would to avoid the partially constructed windfarm and construction vessel activity during the construction phase of the Project (see **Section 13.11.1.2**)**.** Therefore, the additional distances are anticipated to either be very small or to be required by a very limited number of vessels. It is noted that the impact during operation and maintenance will be more long-term compared to that during construction, however reduced safety zones may reduce the distance of required deviations, such that the overall sensitivity is considered similar to that during construction.

13-270. The available sea room is sufficient to allow any minor deviations to typical and adverse weather routes to be undertaken safely.

13-271. As a result, taking the lengthened duration of the impacts, and reduced safety zones into account, the sensitivity of the receptor has been assessed as **Low**.

Significance of Effect

13-272. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance has been assessed as **Minor** (**Table 13-12**).

Secondary Mitigation and Residual Effect

13-273. Through the NRA process, no relevant and/or proportionate further mitigation was identified for this impact relevant to the operational phase. Given that an additional mitigation was identified for the construction phase (see **Section 13.11.1.2**) whereby there would be regular engagement with NorthLink Ferries regarding the IRC pre and during construction, it is concluded that this impact is ALARP.

13-274. Given that this risk control would help manage the impact to ferry routes and increase satisfaction of the ferry operators, the overall magnitude of impact has been re-assessed as **Low**, with deviations expected for an even lower number of vessels. Therefore, the residual effect has been assessed as **Minor** (not significant in EIA terms).

13.11.2.3 Impact 16 Impact on Risk of Allision

13-275. The operation of any windfarm where obstructions are present will increase allision likelihood. In the same way as during construction (**Section 13.11.1.3**), a vessel is most likely to allide with a windfarm structure due to human error or mechanical failure, which could be exacerbated by other factors such as a failure of an AtoN, for example.

13-276. Impacts associated with allision were modelled to establish the likelihood of an allision. The methodology for allision modelling is outlined in the NRA (**Section 8.3**). A summary of the results of the modelling are discussed in this section, given that the risk of allision is considered to be greatest during the operational phase when full build out is achieved. The full results are presented in **Section 8.4 of the NRA**.

Magnitude of Impact

13-277. The allision modelling results for both the Array Area and the IRC Area are presented within the NRA. Although allision events with the IRC Platform are modelled to increase by between 53% and 84%, the modelled frequencies are still low with the highest allision frequency modelled for support vessels at 1 in 23,753 years due to large numbers of support volumes transiting in close to the IRC Platform on route to oil and gas fields.

13-278. Moreover, while modelled allision frequencies for the Array Area are larger (the highest being for the cargo vessels, at 1 in 317 years), this is due to the high-density cargo route that runs east-west to the north of the Array Area and is still considered a low likelihood considering the proposed lifecycle of the Proposed Offshore Development. Similarly, the highest risk WTGs would be those situated at the northern periphery due to their proximity to one of the highest density shipping routes. However, as commercial and passenger vessels maintain adequate passing distances as standard practice, the risk of allision between a commercial or passenger vessel and a WTG or the IRC Platform is considered to be unlikely. Additionally, the available sea room around the Proposed Offshore Development enables vessel masters to take avoiding action and reduces the likelihood of an allision**.**

13-279. Moreover, during the operation and maintenance phase, regular transiting vessels would be more familiar with avoiding a new obstruction following the construction phase. Communication of maintenance activities and progress would be required and is embedded in the Proposed Offshore Development design (EM22, **Table 13-15**) through use of NtM, the Kingfisher Bulletin, and a FMMCP (EM25).

13-280. Overall, while the full number of WTGs increases the likelihood of allision compared to the construction phase, the longer duration will also increase the vessel masters' familiarity with the structures. Therefore, the magnitude of occurrence is assessed to be the same as during construction: **Low**.

Sensitivity of Receptor

13-281. Multiple factors (vessel speed, angle and the engineering of the WTG and vessel characteristics) influence the severity of consequence should an allision occur in any phase of the Proposed Offshore Development. The potential consequences of an allision are considered the same as during the construction phase and are therefore discussed within the construction assessment (see **Section 13.11.1.3**).

13-282. With embedded mitigations including a Lighting and Marking Plan (EM16) and Site Marking and Charting (EM18) (**Table 13-15**), the relevant elements of the Proposed Offshore Development would be well marked and there is sufficient sea room to safely pass around the site rather than through it. However, were one of these vessels to contact a WTG, given the available sea room, a glancing blow with minor damage is considered the most likely outcome. However, it is also noted that an allision could damage mooring line configurations and therefore has the potential to result in a partial break out, further complicating the incident. This impact is discussed separately in **Section 13.11.2.13**.

13-283. Overall, the sensitivity of receptor has been assessed as **Medium,** reflecting both the most likely and worst credible scenarios that were discussed during the construction assessment (**Section 13.11.1.3)**.

Significance of Effect

13-284. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of allision during operation and maintenance has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that smaller vessels may be more likely to choose to transit through the Array Area compared to larger commercial vessels, and the minimum WTG spacing should be sufficient for these vessels to do so safely. In the event that a small vessel did allide with a WTG, the worst credible outcome is constructive loss with a single fatality, however the LMP (EM16) and Promulgation of Information (EM22) will make this very unlikely and the ERCoP (EM30) and its associated towage provision would act to reduce this consequence**.**

Secondary Mitigation and Residual Effect

13-285. Through the NRA process, no relevant and/or proportionate further mitigation was identified for this impact relevant to the operational phase. Given that an additional mitigation was identified for the construction phase (see **Section 13.11.1.3**) whereby there would be regular engagement with NorthLink Ferries regarding the IRC pre and during construction, it is concluded that this impact is ALARP and therefore no further mitigation is required for this phase of the Proposed Offshore Development.

13-286. Given that regular engagement pre and during construction would help manage the impact to ferry routes and increase satisfaction of the ferry operators, the residual effect has been assessed as **Minor** (not significant in EIA terms).).

13.11.2.4 Impact 17 Impact on Risk of Collision

13-287. The presence of an operational (see **Section 13.11.1.4**) offshore windfarm in an otherwise navigable area can constrain shipping routes and result in pinch points or areas of high vessel traffic density, with the potential to increase the number of encounters or potential collision situations.

13-288. The addition of maintenance vessels associated with the Proposed Offshore Development may also increase potential encounter and collision scenarios. These vessels may cross-cut established routes to access the Array Area. The worst-case total additional movements during operation of the Proposed Offshore Development are up to 140 return vessel movements, with a maximum of 18 vessels (**Table 13-14**).

13-289. Impacts associated with collision were modelled to establish the likelihood of a collision. The methodology for collision modelling is outlined in the NRA (**Section 8.3**) and it is noted that modelling assumes maximum build out of the windfarm. A summary of the results of the modelling are therefore discussed in this assessment and the full results are presented in **Section 8.4 of the NRA**.

Magnitude of Impact

13-290. Collision modelling results for the Array Area and IRC Area are presented within the NRA and indicate that the frequency of collision events are low around both the Array Area and the IRC Platform, with one cargo vessel collision modelled every 23,957 years and one passenger vessel collision modelled every 522,332 years, as a result of the windfarm/Array Area. Similarly, one cargo vessel collision is modelled every 16,283 years and one passenger vessel

collision is modelled every 233,707 years, as a result of the IRC Platform. The modelled likelihood of a collision is greatest on routes with higher vessel traffic density. An increase in the future case (with the windfarm present) collision potential is concentrated to the north and north-west of the Array Area, associated with the increased concentration of vessels on transit between Pentland Firth and Europe, as a result of commercial vessels which currently transit through the northern half of the Array Area diverting to the north and joining the existing passage across the north of the Array Area. The IRC Platform causes some of the routes to divert around it, which creates fewer crossing points and results in an overall reduction in the total modelled collision frequency in the IRC Area.

13-291. Based on the analysis, the change in collision risk over the existing baseline because of the Proposed Offshore Development is very low. Although the modelled increase in total collision frequency is 46.3% larger compared to the base case, the total frequency with the Proposed Offshore Development in situ is modelled as one collision event every 11,330 years.

13-292. Collision risk could also be increased within and around the ECC as a result of maintenance vessels associated with the Proposed Offshore Development that could also increase encounter and collision scenarios. The worst-case total additional movements during the operation of the Proposed Offshore Development are up to 140 return vessel movements, with a maximum of 18 vessels at any one time (**Table 13-14).** This increase is not significantly more than the current baseline and, furthermore, the passage planning that will be required on routes for operation and maintenance vessels (as per the proposed NSVMP) will reduce the likelihood of any maintenance vessels encountering, and colliding with, any third-party vessels.

13-293. Overall, considering the collision risk modelling, and the increased familiarity with the Proposed Offshore Development during operation compared to during construction, the magnitude of impact has been assessed as **Negligible**.

Sensitivity of Receptor

13-294. The potential consequence of vessel collisions is considered the same as for during construction (see **Section 13.11.1.4**) and, therefore, the sensitivity of the receptor has been assessed as **Medium.**

Significance of Effect

13-295. Overall, with the magnitude of impact assessed as **Negligible**, and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of collision during operation and maintenance has been assessed as **Minor** (**Table 13-12**) and not significant**.**

Secondary Mitigation and Residual Effect

13-296. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), the passage plans secured within the NSVMP (EM17) and the site marking and charting (EM18) were considered sufficient to reduce the impact of project vessels on established routes, and enable third-party vessels to safely plan routes around the construction activities themselves if required. Therefore, no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered

proportionate to the reduction in risk that would be achieved. As a result, this impact can be considered to be ALARP.

13-297. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.5 Impact 18 Impact on Risk of Grounding

13-298. Changes to vessel routeing as a result of the Proposed Offshore Development may lead to a potential increase in the risk of grounding. Overall, the risk is considered similar for all phases of Proposed Offshore Development (see **Section 13.11.1.5** for the impact during construction).

Magnitude of Impact

13-299. Unlike during construction, during the operation and maintenance phase, once cable burial or protection is complete, the export cable is unlikely to cause any vessels to divert closer to landfall. It is possible that, in some areas, if burial is not possible, and the cable is protected, some large draught vessels might want to divert course slightly to avoid shallower ground. In which case, there is considerable sea room and water depths either side of the ECC, further away from landfall, to enable these deviations without increasing the risk of grounding.

13-300. Furthermore, large project vessels will be working near landfall much less frequently during the Operation and Maintenance phase, with a maximum of 18 vessels working across the Study Area at any one time, compared to the 91 vessels that could be working simultaneously during the construction phase, further reducing the likelihood of a grounding event as a result of the Proposed Offshore Development.

13-301. Overall, embedded mitigation measures detailed in **Table 13-15**, cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as periodic hydrographic surveys (EM29) will reduce the risk of grounding by limiting the need for vessels to deviate around the ECC.

13-302. As a result, the magnitude of impact has been assessed as **Low.**

Sensitivity of Receptor

13-303. The consequences of a vessel grounding during the operational phase is anticipated to be the same as during construction (see **Section 13.11.1.5).**

13-304. As a result, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-305. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of grounding during operation has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that management and coordination of vessel activities secured within the NSVMP (EM17) will reduce the impact of project vessels on established routes, thus mitigating the likelihood of transiting vessels deviating near to the landfall and grounding on the seabed close to shore, and the low likelihood of fatal consequences should a grounding event occur.

Secondary Mitigation and Residual Effect

13-306. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.6 Impact 19 Impact of Towage Operations

13-307. During the operation & maintenance phase, fewer towage operations are anticipated than during the construction phase (**Section 13.11.1.6**) and the impact therefore lower. Some towage operations may still be required as WTGs are taken to and from the Array Area for major maintenance purposes. These operations have potential to affect collision on passage; however the operation and maintenance port(s) have not been determined so the route taken is not known. The towage operations will however be focused around the Array Area and so it is possible to consider the effects on vessel traffic in the vicinity. The greatest potential for interactions with vessel routeing is if the tow is on a coastal route following the current traffic routeing or crossing it to reach the Array Area.

13-308. Through consideration of the baseline traffic distribution that has been considered within the collision modelling (see **Section 13.11.2.4.**) The current likelihood of a collision or allision is low in the study area. There is also sufficient searoom for other vessels to be able to identify the towage operation and act accordingly.

Magnitude of Impact

13-309. Despite the reduced number of towage operations compared to construction, there is still expected to be some impact on towage operations, albeit more infrequently. As a result, the magnitude of impact for operation has also been assessed as **Low.**

Sensitivity of Receptor

13-310. The outcome of a towage operation impacting passing traffic is expected to be much the same as the impact during construction (see **Section 13.11.1.6)**, with the most likely outcome being vessels being RAM and the worst-credible scenario being a collision, although considered very unlikely given the embedded mitigations, including the management and coordination of vessel activities.

13-311. As a result, the sensitivity of the receptor has been assessed as **Low**.

Significance of Effect

13-312. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact of towage operations during operation has been assessed as **Minor** (**Table 13-12**), and not significant**.**

Secondary Mitigation and Residual Effect

13-313. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

13-314. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.7 Impact 20 Impact on Search and Rescue Capabilities

13-315. Maintenance traffic could lead to an increased number of vessels and personnel in the Study Area, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures compared to the baseline. Less project traffic will be required during operation compared to construction (see **Section 13.11.1.7**), so a lower overall impact is anticipated.

Magnitude of Impact

13-316. Most of the factors that might influence SAR capability, such as the lines of orientation and WTG spacing remain the same as during construction (see **Section 13.11.1.7**).

13-317. Similarly, existing incident rates are still considered low in the Study Area based on the data studied within the NRA (**Section 6.3**). An assessment of the impact of the Proposed Offshore Development on the likelihood of collision and allision for vessels during operation and maintenance (**Section 13.11.2.4** and **Section 13.11.2.3**) showed these are considered unlikely, which is due to the generally low levels of vessel traffic in the Study Area. It is not therefore anticipated that the Proposed Offshore Development would notably increase the observed existing incident rates.

13-318. Given the embedded mitigations, including the approval of a layout plan (EM46) and the clear communication and coordination protocols that will be established as part of the ERCoP (EM30), in addition to the low likelihood of incidents, the magnitude of impact has been assessed as **Negligible**.

Sensitivity of Receptor

13-319. The outcome of an impact on SAR capabilities is anticipated to be similar to that expected during the construction phase, with a potential negative impact on casualty visibility, but also with Proposed Offshore Development vessels forming an additional resource to respond to incidents.

13-320. As a result, the sensitivity of the receptor has been assessed as **Low**, given the embedded mitigations and the sea room available to undertake emergency manoeuvres if required.

Significance of Effect

13-321. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on SAR capabilities during operation has been assessed as Negligible/Minor (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to Negligible as for construction, given that, there will be fewer project-vessel movements during the operation and maintenance phase compared to construction, and therefore slightly less likely to be the first response vessel, potentially increasing the requirement for SAR compared to during construction.

Secondary Mitigation and Residual Effect

13-322. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant

mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-323. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.8 Impact 21 Impact on Communications, Radar and Positioning Systems

13-324. As outlined for construction (**Section 13.11.1.8**), windfarm sites may adversely impact equipment used for navigation, collision avoidance or communications. The sound generated by the WTGs could additionally mask navigational sound signals from vessels or aids to navigation.

Magnitude of Impact

13-325. Much of the communication equipment that could be adversely impacted by the presence of the WTGs (including AIS, radar, and GNSS) will be used by vessels frequently transiting in proximity to the windfarm. As a result, the magnitude of impact has been assessed as **Medium**, reflecting the expected frequency with which vessels are anticipated to experience negative impacts.

Sensitivity of Receptor

13-326. The consequence of the Proposed Offshore Development impacting on communications, radar and positioning systems is considered to be similar to that anticipated for during the construction phase (see **Section 13.11.1.8)**, with no appreciable impact on navigation safety expected from the WTGs or the cables.

13-327. As a result of the findings of these studies, the sensitivity of the receptor has been assessed as **Negligible**.

Significance of Effect

13-328. Overall, with the magnitude of impact assessed as **Medium,** and the sensitivity of the receptor assessed as **Negligible,** the overall effect significance of the impact on communication systems during operation has been assessed as **Minor** (**Table 13-12**) and not significant.

Secondary Mitigation and Residual Effect

13-329. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-330. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.9 Impact 22 Impact on Under Keel Clearance due to Subsurface Infrastructure

13-331. As outlined for the construction phase (**Section 13.11.1.9**), where cable burial is not practicable and cable protection is used instead, the depth of water may be reduced, alongside the Under Keel Clearance (UKC) of vessels. For instance, in the nearshore, cable protection may be installed using a standard rock berm creating long linear berm of circa 9 km (KP 1.94 to KP 11) that is perpendicular to the shore. The MCA and RYA recommend that

any protection should not reduce the depth of water (referenced to Chart Datum) by more than 5%.

Magnitude of Impact

13-332. During the operational phase of the Proposed Offshore Development, the reduction of UKC due to subsurface infrastructure is anticipated to impact vessels (both transiting and fixed fishing gear vessels) with the same frequency as is anticipated during the construction phase, given the height of the cable protection and available sea room. While very few vessels with a draught >6 m were identified to transit within 3 nm of the landfall, the closest vessel was recorded 1.5 nm away, where the reduction in water depth could be up to 8. Nevertheless, there is sufficient sea-room north of the landfall for vessels to transit further away from the landfall, with depths exceeding 36 m, in line with MCA and RYA recommendations.

13-333. As a result, the magnitude of impact has been assessed to be **Low**.

Sensitivity of Receptor

13-334. The outcome in the event of a significant reduction in UKC, and a vessel snagging on an export cable, is also anticipated to be the same as during construction, with the most likely outcome consisting of minor injuries and minor vessel damage, and the worst credible outcome involving a single fatality.

13-335. Overall, considering the Cable Plan (EM9) and Cable specification and installation plan (EM47), Periodic surveys (EM29) (all of which are embedded in the Proposed Offshore Development) and the available sea room around the ECC, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-336. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact of subsurface infrastructure on UKC during operation has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, and not significant, as opposed to moderate, given that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable protection if required.

Secondary Mitigation and Residual Effect

13-337. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-338. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.10 Impact 23 Impact on Access to Ports and Harbours

13-339. It is noted that access to local ports may be affected by the presence of the Proposed Offshore Development and the maintenance operations associated with it.

13-340. The nearest ports are Fraserburgh and Peterhead, located 6.2 nm and 4.6 nm north and south of the ECC landfall, respectively.

Magnitude of Impact

13-341. The likelihood of there being an impact to local ports and harbours as a result of the Proposed Offshore Development is considered to be much the same as during construction. However, it is noted that the reduced Proposed Offshore Development vessel activity is likely to reduce the impact frequency slightly, and the potential designated berths at the O&M port may further reduce loitering. Nevertheless, there is still anticipated to be a more than remote probability of access to either port being impacted, given the amount of other vessel loitering in the area associated with either Fraserburgh or Peterhead ports.

13-342. As a result, the magnitude of impact is assessed to be **Low**.

Sensitivity of Receptor

13-343. Given that no increase in the traffic volumes serving the Ports of Peterhead and Fraserburgh, with the exception of maintenance vessels associated with the Proposed Offshore Development (in the event that one or both of these ports were selected for use by the Proposed Offshore Development), is forecast over the operation and maintenance phase the sensitivity of the receptor is expected to be same as during construction: **Low**.

Significance of Effect

13-344. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on access to ports and harbours during operation has been assessed as **Minor** (**Table 13-12**) and not significant**.**

Secondary Mitigation and Residual Effect

13-345. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-346. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.11 Impact 24 Impact on Commercial Fishing Safety

13-347. Fishing vessel activity throughout the Study Area is presented within the NRA and further information is located in **Volume 2, Chapter 11: Commercial Fisheries**. During the Proposed Offshore Development's operation, commercial fisheries may be at risk of displacement or gear snagging. This could be in response to maintenance activities and/or the physical presence of surface and subsurface infrastructure. The assessment of commercial impacts on reduced fishing activity is not considered here and is set out in **Volume 2 , Chapter 11: Commercial Fisheries**.

Magnitude of Impact

13-348. Similar to the construction phase, the presence of Proposed Offshore Development cables may increase anchor and fishing gear snagging risk. It is required in the Proposed Offshore Development embedded mitigation (**Table 13-15**) that both a Cable Plan (EM9; informed by

a CBRA) and a Cable specification and installation plan (EM47) are produced that consider UKC and cable protection to mitigate for potential snagging hazards.

13-349. Similarly, the operation and maintenance phase may cause further displacement or restricted access to fishing grounds. Although there is very limited fishing that takes place with the Array Area itself, some fishing takes place in proximity to the ECC and therefore may be displaced during maintenance works associated with the ECC. However, these should be short-term and relatively infrequent, and the sea room is considered to be sufficient for minor diversions to other fishing locations.

13-350. As a result, with the embedded mitigation measures in place, snagging is expected to be extremely unlikely and any displacement is anticipated to be infrequent, so the magnitude of impact is assessed as **Low**.

Sensitivity of Receptor

13-351. The outcome were a fishing vessel to snag cable is considered the same as for during construction (**Section 0**), with the most likely outcome being loss of gear and minor damage to the cable, and more severe credible, although far less likely, outcome being loss of a fishing vessel and a potential fatality. Despite this unlikely possibility, due to the low consequences of the most likely scenario, and the minimal environmental impact, the hazard was given a low overall risk score of 4.4 in the NRA (Volume 3, Appendix 13.1), which was agreed with all stakeholders following the Hazard Workshop.

13-352. The overall sensitivity of the receptor is therefore assessed as being **Medium**.

Significance of Effect

13-353. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact on commercial fishing safety during operation has been assessed as Minor/moderate (**Table 13-12**) and not significant**.** The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that, while very unlikely, should a fishing vessel snag on a cable, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

Secondary Mitigation and Residual Effect

13-354. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-355. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.12 Impact 25 Impact on Recreational Vessel Safety

13-356. Recreational activity throughout the Study Area is presented in **Section 6 of the NRA**. During the Proposed Offshore Development's operation and maintenance phase, recreational vessel users may be at risk of route displacement, or a collision or allision event. This could be in response to maintenance vessel traffic and/or the physical presence of surface and subsurface infrastructure during operation.

Magnitude of Impact

13-357. The likelihood of disruption to recreational vessels during the operation and maintenance phase is considered similar to that during construction (see **Section 13.11.1.12**). The reduction in project vessel traffic would likely reduce the frequency of potential impact, and, given the numbers of recreational transits as far offshore as the Array Area, impact to recreational activity is expected to be unlikely.

13-358. Hence, the magnitude of impact is assessed as **Low**.

Sensitivity of Receptor

13-359. With regard to the ECC, the occasional presence of maintenance activity is expected to have a much smaller impact compared to the frequent installation activity expected during construction (see **Section 13.11.1.12)**. Therefore, given the required promulgation of information (EM22, **Table 13-15**) that will enable recreational vessels to plan around any planned maintenance activity, and the sea room available for collision avoidance, the impact to recreational vessels is considered to be low.

13-360. The overall sensitivity of the receptor is assessed as being **Low**.

Significance of Effect

13-361. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on recreational vessel activity during operation has been assessed as **Minor** (**Table 13-12**) and not significant**.**

Secondary Mitigation and Residual Effect

13-362. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-363. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.2.13 Impact 26 Impact of WTG Breakout on Vessel Safety

13-364. As outlined for the construction phase (**Section 13.11.1.13**), it is possible that a WTG could become displaced from its position or break free and become a navigational hazard to other vessels.

13-365. WTG blade breakout is also possible in adverse conditions and was raised during consultation (**Table 13-3**) by SPFA and NLB.

Magnitude of Impact

13-366. Given the requirements and regulations to which the moorings are subject to (EM31), that dictates that there must be also be a provision for the continuous monitoring of the floating wind or marine device that could alert a remote monitoring centre in case of mooring failure, and the fact that the Proposed Offshore Development is using up to nine moorings per floater, WTG (or partial WTG) breakout is considered to be very unlikely, and the magnitude of impact is therefore assessed to be **Negligible**.

Sensitivity of Receptor

13-367. Were the WTGs to breakout, the impact of this on both navigating and Project vessels and on other WTGs is anticipated to be the same as is expected during construction (see **Section 13.11.1.13)**.

13-368. Therefore, the sensitivity of the receptor is assessed to be **High**.

Significance of Effect

13-369. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **High,** the overall likely effect significance of the impact of WTG breakout on vessel activity during operation has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is assessed to be **Minor**, and not significant, as opposed to moderate, considering that a WTG breakout is very unlikely given the proposed number of mooring lines and requirements they must comply with. Furthermore, should a WTG (or blade) breakout, it's visibility in accordance with the LMP (EM16) should reduce the risk of allision and the provision of appropriate towage, included within the ERCoP (EM30), embedded within the Proposed Offshore Development, will mitigate the consequence of the incident, by ensuring the WTG (or blade) could be towed away from passing traffic once the breakout has been noted. Overall, the likely significance of effect is assessed to be **Minor**, and not significant**.**

Secondary Mitigation and Residual Effect)

13-370. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13.11.2.14 Impact 27 Impact of Small Movements of Floating Installations around the Nominal Central Location

13-371. A range of movement is associated with the floating foundation technology, which enables small movements of the floating installations around a nominal central location. This movement variation can increase the risk of allision events.

Magnitude of Impact

13-372. Small movements around the central locations occur as a result of certain met ocean conditions that lead to an interaction of waves and currents with the turbine's platform and mooring system. Given the constant variability in metocean conditions, these movements can, therefore, occur frequently in certain conditions. As a result, the magnitude of impact is therefore assessed to be **High**.

Sensitivity of Receptor

13-373. In the event of small WTG movements occurring, the WTG lighting and marking, as listed in the embedded mitigations, mitigate against this risk by ensuring WTGs remain visible to passing traffic at all times. Moreover, the mooring spread will be provided to the United Kingdom Hydrographic Office (UKHO) for inclusion on charts to provide further awareness of structures.

13-374. In addition, the movement of WTGs is unlikely to exceed 100 m dependent on the type of moorings selected, and vessels transiting through the area would not plan a passage that is within this distance from an individual WTG. Commercial vessels typically plan a minimum distance of 1 nm from an obstruction (i.e. a WTG). Whilst smaller vessels such as fishing vessels may transit through the Array Area, it is unlikely that they would plan to pass within 100 m of a WTG, particularly in rougher seas where movement is more likely. As a result, these small movements are unlikely to have any impact on third-party vessels.

13-375. With regard to project vessels operating in the Array Area, WTG movements are considered unlikely to cause an allision given that the WTG movement is likely to be driven by weather limitations and associated metocean conditions. As a result, any maintenance activities would likely cease to avoid transiting in adverse conditions.

13-376. Moreover, the WTG movement would not be expected to change quickly enough to cause a project vessel to allide with a WTG.

13-377. Taking this into account, the sensitivity of the receptor is assessed to be **Negligible**.

Significance of Effect

13-378. Overall, with the magnitude of impact assessed as **High,** and the sensitivity of the receptor assessed as **Negligible,** the overall effect significance of the impact of small movements of floating installations during operation has been assessed as Minor/moderate (**Table 13-12**)**.** A **Minor**, and not significant, rather than moderate effect has been determined given these small movements are not expected to adversely impact maintenance vessels (given their experience with transiting close to WTGs) or passing vessel traffic, that may choose to transit within the Array Area.

Secondary Mitigation and Residual Effect

13-379. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-380. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms)

13.11.3 Decommissioning Phase

13-381. The potential impacts during decommissioning of the Proposed Offshore Development have been assessed for shipping and navigation. The likely significant effects on shipping and navigation caused by each identified impact discussed in this section for decommissioning are considered to be largely the same during the construction phase.

13-382. It is noted that no decision has been made regarding the final decommissioning plan for the Proposed Offshore Development as it is recognised that industry best practice, rules and legislation change over time. The decommissioning methodology would be finalized nearer to the end of the lifetime of the Offshore Proposed Offshore Development to be in line with the applicable consents and marine licences, current guidance, policy and legislation at that point. Any such methodology would be agreed with the relevant authorities and statutory consultees. The decommissioning works are likely to be subject to a separate licensing and consenting approach.

13.11.3.1 Impact 28 Impact of Floating Mooring and Cable Systems on Interactions with Vessels at a Risk of Snagging

13-383. Floating offshore WTGs are typically moored to the seabed through a spread of subsurface mooring cables and chains. These moorings can pose a risk to navigating vessels through snagging of anchors or fishing gear.

13-384. The Proposed Offshore Development description (see **Volume 1 , Chapter 4: Proposed Offshore Development Description**) notes that the exact floater and corresponding mooring configuration has not been determined at the time of writing this EIAR. Therefore, the worst-case spread of 1,750 m radius moorings from each WTG has been assumed.

13-385. A second hazard relates to the potential impact of Inter-Array Cable (IAC) systems and the export cables within the ECC. These present a snagging risk to vessel anchors or fishing gear, particularly within the mooring radius of the floaters.

13-386. It is noted that these hazards will reduce as decommissioning progresses and the extent of structures within the Array Area reduces.

Magnitude of Impact

13-387. The magnitude of impact is expected to remain relatively similar to that during the construction phases of the Proposed Offshore Development (**Section 13.11.1.1**). However, throughout the decommissioning phase of the Proposed Offshore Development, vessel masters should be more familiar with the location of cables, which would also be charted (EM18), further reducing the likelihood of a snagging incident. Moreover, the frequency of impact would reduce during decommissioning due to the reduction in structures and their moorings within the Array Area.

13-388. The vessel traffic analysis undertaken as part of the NRA (see **Section 6.2.2.5 of Volume 3, Appendix 13.1: NRA**) has shown that the Study Area is used primarily by transiting vessels on route to fishing grounds outside the Array Area. Nevertheless, snagging is also possible where fixed gear fishing takes place further nearshore. Although, very few vessels currently transit within the ECC in depths shallower than 20m, and the site marking and charting, in addition to promulgation of information should enable these vessels to plan around this if necessary, limiting the likelihood of a snagging incident in this area. . Fishing activity present within the Study Area is detailed in **Section 6.2.2.5 of the NRA** and further information is located in **Volume 2, Chapter 11: Commercial Fisheries.** Similar to construction, any decommissioning works required would be communicated with local sea users, including the fishing community, in accordance with the embedded mitigation measures outlined in **Table 13-15**.

13-389. Cable burial and adequate protection would mitigate the risk of snagging once burial is complete. The requirement for a cable burial risk assessment is an embedded mitigation (EM9, **Table 13-15**) for the Proposed Offshore Development to ensure these risks are adequately addressed for the types of gear used within the Study Area. As such, with embedded mitigation measures in place, snagging is expected to be extremely unlikely.

13-390. Overall, on the basis of the worst-case mooring assumptions, and the embedded mitigation measures, the magnitude of impact has been assessed as **Low.**

Sensitivity of Receptor

13-391. In the event that a vessel were to snag a cable, the most likely outcome is loss of gear and minor damage to the cable. A more severe credible outcome is the potential loss of the vessel and fatalities however, this is considered very unlikely, given the embedded mitigation measures in place, notably the FMMCP (EM25) that will include a FLO to aid ongoing liaison and discussions, and the provision of an ERCoP (EM30), which would provide the actions to be taken during emergency situations. The MCA also operate an ETV to the north and west of Scotland, until 2028, with the potential for this contract to be extended, which could further mitigate the consequence. Therefore, given how unlikely a fatality is as a result of a vessel snagging on cables or moorings, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-392. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that the FMMCP (EM25) and appropriate site charting (EM18), embedded within the Proposed Offshore Development, would reduce the likelihood of the impact and, in the unlikely event an incident occurred, the ERCoP and its associated towage provision would reduce the consequence.

Secondary Mitigation and Residual Effect

13-393. Through the NRA process, no relevant and/or proportionate further mitigation was identified, and it is concluded that this impact is ALARP.

13-394. The residual effect of the impact of floating mooring and cable systems on interactions with vessels at a risk of snagging during decommissioning has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.2 Impact 29 Impact on commercial vessel and ferry routes

13-395. Existing commercial vessel and passenger ferry traffic could be displaced during decommissioning due to the presence of decommissioning vessels and partially de-commissioned structures. Detailed decommissioning schedules and areas would be defined post-consent, but it is assumed that displacement would be greatest when the windfarm is fully constructed (maximum footprint) which is assessed in the operation and maintenance impacts (**Section 13.11.2.2**).

13-396. The obstruction and subsequent rerouting presented by windfarm decommissioning activities has the potential to result in increased journey time and distances compared to the existing baseline. Impacts on routeing may in turn lead to increased allision or collision risks (**Section 13.11.2.3** and **Section 13.11.2.4**).

Magnitude of Impact

13-397. The magnitude of impact during decommissioning is considered to be very similar to that during construction, as the number of effected transits will most likely be the same. Therefore, given the similar level of impact to typical and adverse weather routeing as during construction, and the same embedded mitigation measures, including an AtoN

management plan (EM20, see PMP 4: AtoNMP) and promulgation of information (EM22), the magnitude/frequency of occurrence has been assessed as **Low**, with deviations experienced more than once during the Project lifecycle, albeit to a low number of vessels.

Sensitivity of Receptor

13-398. Passenger and commercial vessels are likely to reroute to avoid the Array Area, any decommissioning vessel activity and the associated safety zones in much the same way as they would to avoid the partially constructed windfarm and construction vessel activity during the construction phase of the Project (see **Section 13.11.1.2**)**.** It is anticipated that the Project will apply for 500m safety zones for decommissioning, as with construction. Therefore, the additional distances are anticipated to either be very small or to be required by a very limited number of vessels.

13-399. The available sea room, taking into account potential 500m safety zones, is still considered sufficient to allow any minor deviations to typical and adverse weather routes to be undertaken safely.

13-400. As a result, given the available sea room and minor deviations, the sensitivity of the receptor has been assessed as **Low**.

Significance of Effect

13-401. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance has been assessed as **Minor** (**Table 13-12**).

Secondary Mitigation and Residual Effect

13-402. Through the NRA process, no relevant and/or proportionate further mitigation was identified for this impact relevant to the operational phase. Given that an additional mitigation was identified for the construction phase (see **Section 13.11.1.2**) whereby there would be regular engagement with NorthLink Ferries regarding the IRC pre and during construction, it is concluded that this impact is ALARP.

13-403. Given this additional risk control should reduce the frequency of occurrence on NorthLink vessels, the overall magnitude of impact has been assessed as **Low**, with deviations expected on for an even lower number of vessels. Therefore, the residual significance of effect has been assessed as **Minor**, and not significant in EIA terms.

13.11.3.3 Impact 30 Impact on Risk of Allision

13-404. The decommissioning of any windfarm in otherwise navigable waters increases allision likelihood. During decommissioning, a vessel is most likely to make contact with a windfarm structure as a result of human error or mechanical failure, which could be exacerbated by other factors such as a failure of an AtoN or adverse weather conditions, for example.

13-405. Impacts were modelled to establish the likelihood of an allision. The methodology for allision modelling is outlined in the NRA (**Section 8.3**). Allision impacts are considered to be greatest during the operational phase when full build out is achieved, and modelling was conducted on this basis. The full results of the modelling are therefore presented in the operational phase assessment (**Section 13.11.2.3**).

Magnitude of Impact

13-406. Analysis of historic allision incidents at existing offshore windfarms have primarily involved project vessels at low speed. Project vessels, although more likely to allide with a WTG due to their working in close proximity, are also more likely to have crew who are experienced in safely transiting offshore windfarm areas.

13-407. The highest modelled allision frequency was the probability of a cargo vessel allision within the Array Area, at 1 in 317 years. This is due to the high-density cargo route that runs east-west to the north of the Array Area and is still considered a low likelihood due to the lifecycle of the Proposed Offshore Development.

13-408. Taking the allision modelling into account, the magnitude of impact during decommissioning is considered to be the same as during construction, noting however that the likelihood of an allision will significantly reduce during the decommissioning phase as the number of structures within the Array Area reduces.

13-409. During the decommissioning phase, regular transiting vessels would be more familiar with avoiding a new obstruction following the construction and O&M phases. Communication of decommissioning activities and progress would be required and is embedded in the Proposed Offshore Development design (EM22, **Table 13-15**) through use of NtM, the Kingfisher Bulletin, and a FMMCP (EM25).

13-410. Overall, the magnitude of occurrence is assessed to be the same as during construction: **Low**.

Sensitivity of Receptor

13-411. Multiple factors (vessel speed, angle and the engineering of the WTG and vessel characteristics) influence the severity of consequence should an allision occur in any phase of the Proposed Offshore Development. The potential consequences are discussed under the construction assessment (see **Section 0**).

13-412. With embedded mitigations including a Lighting and Marking Plan (EM16) and Site Marking and Charting (EM18) (**Table 13-15**), the Array Area would be well marked and there is sufficient sea room to safely pass around the site rather than through it. However, were one of these vessels to contact a WTG, given the available sea room, a glancing blow with minor damage is considered the most likely outcome. However, it is also noted that an allision could damage mooring line configurations and therefore has the potential to result in partial break out, which is further discussed in **Section 13.11.2.13**. Alternatively, a large vessel alliding with a WTG could also result in WTG collapse, holing and eventual flooding of a vessel, however, given the promulgation of information promulgation (EM22) embedded in the Project, this is considered highly unlikely.

13-413. Overall, the sensitivity of receptor has been assessed as **Medium,** reflecting both a most likely and worst credible scenario.

Significance of Effect

13-414. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of allision during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of

effect for this hazard is considered to be **Minor**, as opposed to moderate, given that smaller vessels are more likely to choose to transit through the Array Area, and the minimum WTG spacing should be sufficient for these vessels to do so safely. Yet, in the event a small vessel did allide with a WTG, light contact is most likely, and the ERCoP (EM30) and its associated towage provision would further minimise the consequence.

Secondary Mitigation and Residual Effect

13-415. Through the NRA process, no relevant and/or proportionate further mitigation was identified for this impact relevant to the operational phase. Given that an additional mitigation was identified for the construction phase (see **Section 13.11.1.2**) whereby there would be regular engagement with NorthLink Ferries regarding the IRC pre and during construction, it is concluded that this impact is ALARP and no further mitigation is considered necessary for the decommissioning phase..

13-416. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.4 Impact 31 Impact on Risk of Collision

13-417. The decommissioning of an offshore windfarm in an otherwise navigable area can constrain shipping routes and result in pinch points or areas of high vessel traffic density, with the potential to increase the number of encounters or potential collision situations.

13-418. The addition of project vessels associated with the decommissioning of the Proposed Offshore Development may also increase potential encounter and collision scenarios. These vessels may cross-cut established routes to access the Array Area. As with construction, blind spots may result from WTGs or the presence of large decommissioning vessels blocking or hindering the view of other navigating vessels which could increase the risk of collision by reducing the capability for early and effective collision avoidance. The presence of the obstructions may also result in reduced space for a vessel to take action to avoid collision or reduce the options available to do so. As a result, the risk of collision will be greatest in and around the Array Area, where there will be more surface infrastructure (obstructions), while the IRC Area just has the IRC Platform. The ECC (excluding the IRC Platform) will have no surface infrastructure and therefore a lower collision risk.

13-419. Modelling was undertaken to establish the likelihood of a vessel collision occurring. The methodology is outlined in Volume 3, Appendix 13.1: NRA (**Section 8.4**). It is noted that modelling assumes maximum build out of the windfarm and the most south-westerly location within the Indicative IRC Area for the IRC Platform. It is therefore expected that, during the decommissioning phases, these return periods would be lower with collision risk considered less likely up to and following the point of full build-out.

Magnitude of Impact

13-420. Analysis of historic incidents associated with UK operational windfarms identified 69 incidents between 2010 and 2019. This includes six collisions, 29 allisions, 21 groundings and 13 near misses. Of these incidents, 82% involved project craft (such as CTVs or construction/decommissioning vessels). There are currently no recorded accidents involving large commercial shipping and offshore windfarms in the UK, during decommissioning.

13-421. Modelling results are detailed in the Volume 3, Appendix 13.1: NRA and indicate that the frequency of collision events are low around both the Array Area and the IRC Platform, with

1 cargo vessel collision modelled for every 23,957 years and 1 passenger vessel collision modelled for every 522,332 years, as a result of the Array Area, and 1 cargo vessel collision modelled every 16,283 years and 1 passenger vessel collision modelled every 233,707 years, as a result of the IRC Platform.

13-422. Taking the collision modelling into account, the magnitude of impact during decommissioning is considered to be the same as during construction, noting however that the likelihood of a collision will significantly reduce during the decommissioning phase as the number of structures within the Array Area reduces and the sea room increases.

13-423. Decommissioning vessel movements may interact with existing traffic, for example, when crossing shipping routes, increasing encounter potential and therefore collision risk. Risk controls would be established (as set out in the embedded mitigation listed in **Table 13-15**) to deconflict project vessel movements with other passing traffic. Coordinated passage plans for project vessels would be developed to reduce the potential impact on other traffic.

13-424. Overall, considering the minimum spacing of 1.42km (> 4.5 times the maximum rotor diameter) between WTGs and the density of traffic passing within the Study Area, in addition to the Navigation Safety and Vessel Management Plan (NSVMP) (EM17) embedded in the Proposed Offshore Development (**Table 13-15**), the magnitude of impact has been assessed to be the same as during construction: **Low** .

Sensitivity of Receptor

13-425. The potential consequence of vessel collisions are considered the same as for during construction (see **Section 13.11.1.4**) and, therefore, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-426. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of collision during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that the NSVMP (EM17) will minimise the impact of project vessels on established routes, and site marking and charting (EM18) will enable advance passage planning around the decommissioning activities themselves. The available sea room is also considered sufficient for collision avoidance if required.

Secondary Mitigation and Residual Effect

13-427. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), the passage plans secured within the NSVMP (EM17) and the site marking and charting (EM18) were considered sufficient to reduce the impact of project vessels on established routes, and enable third-party vessels to safely plan routes around the decommissioning activities themselves if required. Therefore, no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the reduction in risk that would be achieved. As a result this impact can be considered to be ALARP.

13-428. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.5 Impact 32 Impact on Risk of Grounding

13-429. Changes to vessel routeing as a result of the Proposed Offshore Development may lead to a potential increase in the risk of grounding. Overall, the risk is considered similar for all phases of Proposed Offshore Development (see **Section 13.11.1.5** for the impact during construction).

Magnitude of Impact

13-430. Analysis of vessel draughts within the Array Area (**Section 8.2 of the NRA**) demonstrates that the majority (> 92%) of vessels (where the draught is known) are less than 10 m in draught.

13-431. As with construction, it is possible that a decommissioning vessel with a draught > 6 m could ground during the decommissioning phase, although this would be considered an incident associated with the Proposed Offshore Development, as opposed to an incident occurring to a third-party vessel as a result of the Proposed Offshore Development. This risk is therefore mitigated through the production of an NSVMP (EM17), which sets out the requirements that the project vessels are subject to.

13-432. Embedded mitigation measures detailed in **Table 13-15**, cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as the obtainment of detailed seabed data through periodic hydrographic surveys (EM29) will ensure that large decommissioning vessels are not expected to operate in water depths which are too shallow, in order to minimise the risk of grounding. This should also limit the need for vessels to deviate around the nearshore ECC and, therefore, reduce the risk of them transiting closer to shore and grounding on the seabed.

13-433. As a result, the magnitude of impact has been assessed as **Low.**

Sensitivity of Receptor

13-434. The consequences of a vessel grounding during the decommissioning phase is anticipated to be the same as during construction (see **Section 13.11.1.5).**

13-435. As a result, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-436. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the risk of grounding during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.** The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that the NSVMP (EM17) will reduce the impact of project vessels on established routes, thus mitigating the likelihood of transiting vessels deviating near to the landfall and grounding on the seabed close to shore, and the low likelihood of fatal consequences should a grounding event occur.

Secondary Mitigation and Residual Effect

13-437. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development

(**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

13-438. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.6 Impact 33 Impact of Towage Operations

13-439. There will be significant towage operations required for the Proposed Offshore Development throughout the decommissioning phase as WTGs are from the Array Area. These operations may require up to four offshore tugs to operate with the tow, resulting in vessels being Restricted in Ability to Manoeuvre (RAM). These operations have potential to affect collision on passage; however the decommissioning ports have not been determined so the route taken is not known. The towage operations will however be focused around the Array Area and so it is possible to consider the effects on vessel traffic in the vicinity. The greatest potential for interactions with vessel routeing is if the tow is on a coastal route following the current traffic routeing or crossing it to reach the Array Area.

13-440. Through consideration of the baseline traffic distribution that has been considered within the collision modelling (see **Section 13.11.2.4.**) The current likelihood of a collision or allision is low in the study area. There is also sufficient searoom for other vessels to be able to identify the towage operation and act accordingly.

Magnitude of Impact

13-441. The number of towage operations is anticipated to be the same as during construction, and therefore, the magnitude of impact has been assessed to be the same: **Low.**

Sensitivity of Receptor

13-442. The outcome of a towage operation impacting passing traffic is expected to be much the same as the impact during construction (see **Section 13.11.1.6)**, with the most likely outcome being vessels being RAM and the worst- credible scenario being a collision, although considered very unlikely given the embedded mitigations, including the management and coordination of vessel activities..

13-443. As a result, the sensitivity of the receptor has also been assessed as **Low**.

Significance of Effect

13-444. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact of towage operations during decommissioning has been assessed as **Minor** (**Table 13-12**)**.**

Secondary Mitigation and Residual Effect

13-445. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant further mitigation measures beyond those embedded within the Proposed Offshore Development (**Table 13-15**) were identified and considered proportionate to the risk, such that this impact can be considered to be ALARP.

13-446. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.7 Impact 34 Impact on Search and Rescue Capabilities

13-447. Decommissioning traffic would lead to an increased number of vessels and personnel in the Study Area, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures. However, it should be noted that the impacts will reduce as decommissioning progresses and the extent of structures within the Array Area reduces.

Magnitude of Impact

13-448. Existing incident rates are considered low in the Study Area based on the data studied within the NRA. An assessment of the impact of the Proposed Offshore Development on the likelihood of collision and allision for vessels during decommissioning (**Section 13.11.3.4** and **Section 13.11.3.3**) showed these are considered unlikely, which is due to the generally low levels of vessel traffic in the Study Area. Therefore, it is not anticipated that the Proposed Offshore Development would notably increase the observed existing incident rates, and consequently the likelihood of requiring SAR in the Array Area is relatively low.

13-449. Given the embedded mitigations (**Table 13-15**) that act to minimise the likelihood of incidents (e.g., the clear communication and coordination protocols establishes through the ERCoP (EM30)), and therefore the need for SAR, and the low baseline incident rates, the magnitude of impact has been assessed to be the same as during construction: **Negligible**.

Sensitivity of Receptor

13-450. The outcome of an impact on SAR capabilities is anticipated to be similar to that expected during the construction phase, with a potential negative effect on casualty visibility, but also with Proposed Offshore Development vessels forming an additional resource to respond to incidents.

13-451. As a result, the sensitivity of the receptor has been assessed as **Low**, given the embedded mitigations and the sea room available to undertake emergency manoeuvres if required.

Significance of Effect

13-452. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on SAR capabilities during decommissioning has been assessed as Negligible/Minor (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Negligible**, as opposed to Minor, given that, while unlikely, should an incident occur in proximity to the Proposed Offshore Development, the project vessels are likely to be nearby and therefore be the first response vessel, further minimising the impact on SAR requirement.

Secondary Mitigation and Residual Effect

13-453. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-454. The residual effect has therefore been assessed as **Negligible** (not significant in EIA terms).

13.11.3.8 Impact 35 Impact on Communications, Radar and Positioning Systems

13-455. As outlined for construction (**Section 13.11.1.8**), windfarm sites may adversely impact equipment used for navigation, collision avoidance or communications. The sound generated by the WTGs could additionally mask navigational sound signals from vessels or aids to navigation.

Magnitude of Impact

13-456. A lot of the communication equipment that could be adversely impacted by the presence of the WTGs and cables (including AIS, radar, and GNSS) will be used by vessels frequently transiting in proximity to the windfarm. However, like during construction, not all of these vessels will experience these impacts given that vessels can use different technologies, and transit at different distances from the structures. As a result, the magnitude of impact has been assessed as **Medium.**

Sensitivity of Receptor

13-457. The consequence of the Proposed Offshore Development impacting on communications, radar and positioning systems is considered to be similar to that anticipated during the construction phase (see **Section 13.11.1.8)**, with no appreciable impact on navigation safety expected from the Proposed Offshore Infrastructure.

13-458. As a result of the findings of these studies, the sensitivity of the receptor has been assessed as **Negligible**.

Significance of Effect

13-459. Overall, with the magnitude of impact assessed as **Medium,** and the sensitivity of the receptor assessed as **Negligible,** the overall effect significance of the impact on communication systems during decommissioning has been assessed as **Minor** (**Table 13-12**)**.**

Secondary Mitigation and Residual Effect

13-460. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-461. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.9 Impact 36 Impact on Under Keel Clearance due to Subsurface Infrastructure

13-462. Although cable burial (the Proposed Offshore Development has a target burial depth of 1.5 m) mitigates the risk of snagging post-construction, and the CBRA (EM9) as part of the embedded mitigations (**Table 13-15**) will seek to ensure these risks are adequately addressed for the types of gear used within the ECC Study Area, in some areas, cable burial may not be practicable, and they must be protected by other means, such as standard rock berm/concrete mattresses. For instance, in the nearshore, cable protection may be installed using a standard rock berm creating long linear berm of circa 9 km (KP 1.94 to KP 11) that is perpendicular to the shore. Where this is the case, the depth of water may be reduced, alongside the Under Keel Clearance (UKC) of vessels. There is also the potential for rock placements to be left in situ during decommissioning to serve as artificial reefs. The MCA and

RYA recommend that any protection should not reduce the depth of water (referenced to Chart Datum) by more than 5%.

Magnitude of Impact

13-463. During the decommissioning phase of the Proposed Offshore Development, the reduction of UKC due to subsurface infrastructure is anticipated to impact vessels (both transiting and fixed fishing gear vessels) with the same frequency as is anticipated during the construction phase, given the height of the cable protection and available sea room. While very few vessels with a draught >6 m were identified to transit within 3 nm of the landfall, the closest vessel was recorded 1.5 nm away, where the reduction in water depth could be up to 8%. Nevertheless, there is sufficient sea-room north of the landfall for vessels to transit further away from the landfall, with depths exceeding 36 m, in line with MCA and RYA recommendations.

13-464. As a result, the magnitude of impact has been assessed to be **Low**.

Sensitivity of Receptor

13-465. The outcome in the event of a significant reduction in UKC, and a vessel snagging on an export cable, is also anticipated to be the same as during construction, with the most likely outcome consisting of minor injuries and minor vessel damage, and the worst credible outcome involving a single fatality.

13-466. Overall, considering the cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as the obtainment of detailed seabed data through periodic hydrographic surveys (EM29) (all of which are embedded in the Proposed Offshore Development) and the available sea room around the ECC, the sensitivity of the receptor has been assessed as **Medium**.

Significance of Effect

13-467. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact of subsurface infrastructure on UKC during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development) will provide the actions to be taken during emergency situations (EM30) that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable protection if required.

Secondary Mitigation and Residual Effect

13-468. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-469. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.10 Impact 37 Impact on Access to Ports and Harbours

13-470. It is noted that access to local ports may be affected by the decommissioning activities associated with the Proposed Offshore Development.

13-471. The nearest ports that could potentially be affected by decommissioning activities are Fraserburgh and Peterhead, located 6.2 nm and 4.6 nm north and south of the ECC landfall, respectively.

Magnitude of Impact

13-472. The likelihood of there being an impact to local ports and harbours as a result of the Proposed Offshore Development is considered to be much the same as during construction. However, it is noted that the reduction in Proposed Offshore Infrastructure throughout the phase is likely to reduce the impact frequency slightly, and the potential designated berths at the O&M port that will likely remain operational into the decommissioning phase, may further reduce loitering.

13-473. Given the >6 nm distance of the cable landfall from the ports, the amount of loitering associated with either port, and the management of project vessels that will be set out in the NSVMP (EM17), the magnitude of impact on access to the ports is assessed to be **Low**.

Sensitivity of Receptor

13-474. Given the amount of unrestricted sea room either side of the ECC, and the amount of disruption that would likely be experienced in the event that access is impacted, the severity of consequence is considered to be the same as construction: **Low**.

Significance of Effect

13-475. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Low,** the overall effect significance of the impact on access to ports and harbours during decommissioning has been assessed as **Minor** (**Table 13-12**)**.**

Secondary Mitigation and Residual Effect

13-476. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-477. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.11 Impact 38 Impact on Commercial Fishing Safety

13-478. Fishing vessel activity throughout the Study Area is presented in the Volume 3, Appendix 13.1: NRA and further information is located in **Volume2, Chapter 11: Commercial Fisheries**. During the Proposed Offshore Development decommissioning, commercial fisheries may be at risk of gear snagging, route displacement or a collision or allision event. This could be in response to decommissioning activities and/or the physical presence of partially deconstructed infrastructure.

Magnitude of Impact

13-479. Similar to the construction phase, the presence of Proposed Offshore Development cables may increase anchor and fishing gear snagging risk. Local sea users will be made aware of the decommissioning activities and any partially protected cables via NtMs or via the Kingfisher bulletin (EM22).

13-480. Overall, as a result, taking into account the embedded mitigation measures, including promulgation of information and the NSVMP (EM17), and the fact that decommissioning activities are only short-term, the magnitude of impact is assessed to be the same as during construction: **Low**.

Sensitivity of Receptor

13-481. The outcome were a fishing vessel to snag cable is considered the same as for during construction (**Section 0**), with the most likely outcome being loss of gear and minor damage to the cable, and more severe credible outcome being loss of a fishing vessel and a potential fatality. Despite the worst-credible scenario, due to its incredibly low likelihood, and the low consequences of the most likely scenario, and the minimal environmental impact, the hazard was given a low overall risk score of 4.4 in the NRA (Volume 3, Appendix 13.1), which was agreed with all stakeholders following the Hazard Workshop.

13-482. The overall sensitivity of the receptor is therefore assessed as being **Medium**.

Significance of Effect

13-483. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact on commercial fishing safety during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is considered to be **Minor**, as opposed to moderate, given that, while very unlikely, should a fishing vessel snag on a cable, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

Secondary Mitigation and Residual Effect

13-484. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-485. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.12 Impact 39 Impact on Recreational Vessel Safety

13-486. Recreational activity throughout the Study Area is presented within the Volume 3, Appendix 13.1: NRA. During the Proposed Offshore Development decommissioning phase, recreational vessel users may be at risk of route displacement, grounding, or a collision or allision event. This could be in response to project vessel traffic, decommissioning activities and/or the physical presence of partially deconstructed surface and subsurface infrastructure.

Magnitude of Impact

13-487. The likelihood of disruption to recreational vessels during the decommissioning phase is considered the same as that during construction (see **Section 13.11.1.12**). The reduction in project infrastructure would reduce the frequency of potential impact, and, given the numbers of recreational transits as far offshore as the Array Area, impact to recreational activity is expected to be unlikely.

13-488. Hence, the magnitude of impact is assessed as **Low**.

Sensitivity of Receptor

13-489. As with construction activity, decommissioning activity within the Array Area is not considered likely to have a significant impact on recreational vessel users, given the available sea room around the structures to enable deviation.

13-490. With regard to the decommissioning of the export cables near landfall, the most likely scenario and worst credible scenario is considered to be the same as for construction and therefore the sensitivity of the receptor is assessed to be the same, noting that the worst-credible scenario is considered very unlikely given the embedded mitigation measures in place. The promulgation of information via NtMs (EM22), and the notification of the UKHO and standard list of stakeholders as to the progress of the construction of the Project (i.e. the status of infrastructure associated with the Project), will enable recreational vessels to effectively passage plan in advance to reduce the risk of grounding. The ERCoP (EM30) will also provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

13-491. The overall sensitivity of the receptor is therefore assessed as being **Medium**.

Significance of Effect

13-492. Overall, with the magnitude of impact assessed as **Low,** and the sensitivity of the receptor assessed as **Medium,** the overall effect significance of the impact on recreational vessel activity during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is assessed to be **Minor**, as opposed to moderate, considering that a snagging incident is very unlikely given the limited recreational activity around the Array Area and the IRC Area and that, should a recreational vessel snag on a cable in the ECC near landfall, the ERCoP (embedded within the Proposed Offshore Development) (EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the vessel could be towed away from the cable if required.

Secondary Mitigation and Residual Effect

13-493. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

13-494. The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.3.13 Impact 40 Impact of WTG Breakout on Vessel Safety

13-495. As outlined for the construction phase (**Section 13.11.1.13**), it is possible that a WTG could become displaced from its position or break free prior to being removed from the Array Site and become a navigational hazard to other vessels.

13-496. WTG blade breakout is also possible in adverse conditions, and was raised during consultation (**Table 13-3**).

Magnitude of Impact

13-497. The Proposed Offshore Development is using up to nine moorings per floater, reducing the likelihood of a WTG moving position in the event that one mooring line does fail. Taking this into account, alongside the requirements to which the moorings are initially subject to (EM31), that dictates that there must be also be a provision for the continuous monitoring of the floating wind or marine device that could alert a remote monitoring centre in case of mooring failure, WTG (or partial) WTG breakout is considered to be very unlikely, and the magnitude of impact is therefore assessed to be **Negligible**.

Sensitivity of Receptor

13-498. Were the WTGs to breakout, the impact of this on both navigating and Project vessels and on other WTGs is anticipated to be the same as is expected during construction (see **Section 13.11.1.13)**.

13-499. Therefore, the sensitivity of the receptor is assessed to be **High**.

Significance of Effect

13-500. Overall, with the magnitude of impact assessed as **Negligible,** and the sensitivity of the receptor assessed as **High,** the overall likely effect significance of the impact of WTG breakout on vessel activity during decommissioning has been assessed as Minor/moderate (**Table 13-12**)**.**The significance of effect for this hazard is assessed to be **Minor**, as opposed to moderate, considering that a WTG breakout is very unlikely given the proposed number of mooring lines and requirements they must comply with. Furthermore, should a WTG (or blade) breakout, it's visibility should minimise the risk of allision and the ERCoP (EM30, embedded within the Proposed Offshore Development) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident, by ensuring the WTG (or blade) could be towed away from passing traffic once the breakout has been noted. Overall, the significance of effect is assessed to be **Minor.**

Secondary Mitigation and Residual Effect

13-501. As this impact has been assessed as not significant, further mitigation is not required. Through the NRA process (**Section 9 of Volume 3, Appendix 13.1: NRA**), no relevant mitigation further to those embedded in the Proposed Offshore Development (**Table 13-15**) was identified, and it is concluded that this impact is ALARP.

The residual effect has therefore been assessed as **Minor** (not significant in EIA terms).

13.11.4 Proposed Monitoring

13-502. **Table 13-16** describes proposed monitoring to supplement mitigation of effects discussed above.

Table 13-16 Proposed Monitoring to Supplement Mitigation for Impacts on Shipping and Navigation

Impact	Proposed Monitoring	Implementation Method
Impact on Risk of Grounding And Impact on Under Keel Clearance due to Subsurface Infrastructure	Periodic Hydrographic Surveys to the International Hydrographic Organisation (IHO) Order 1a standard (that meets MGN 654 requirements), with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UKHO.	Implemented as per the requirements of MGN 654.
Impact on Risk of Grounding And Impact on Under Keel Clearance due to Subsurface Infrastructure	Monitoring of the cables and their burial status post-installation, to be set out in the Cable Plan.	Implemented through adherence to the Cable Plan.
Impact on Risk of Collision	Monitoring of Proposed Offshore Development vessel traffic to be undertaken as per the Outline Navigational Safety and Vessel Management Plan (NSVMP)	Implemented through adherence to the NSVMP.
Impact on Risk of Allision	AtoN monitoring, as detailed within the AtoN Management Plan.	Implemented through adherence to the AtoN Management Plan

13.12 CUMULATIVE EFFECTS ASSESSMENT

13.12.1 Methodology

13-503. **Volume 1, Chapter 5: EIA Methodology** details how potential cumulative effects will be assessed for the Proposed Offshore Development together with other relevant plans, Proposed Offshore Developments and activities through a Cumulative Effects Assessment (CEA). Those plans/Proposed Offshore Developments relevant to the CEA for shipping and navigation are based upon the results of a screening exercise

13-504. Each project or plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect receptor pathways and the spatial or temporal scales involved.

13-505. These other plans or projects may present different levels of potential cumulative effect when combined with the Proposed Offshore Development, informed by other plan/project's readiness and likelihood for actual operation. A tiered approach to the CEA is therefore applied here, allowing weighted assessment of cumulative effects. A tiered approach provides a framework for placing relative weight on the potential for each project or plan to

be included in the CEA to be realised taking into account the project or plans current stage of maturity and certainty in the projects' parameters. The following tiers will be employed in the shipping and navigation CEA:

- Tier 1 – The Proposed Offshore Development, combined with onshore elements of the project;
- Tier 2 – All projects or plans assessed under Tier 1, plus those plans/projects which have become operational since the baseline characterisation of the Proposed Offshore Development, plus those under construction, those with consent, and those pending determination following a submitted application;
- Tier 3 – All projects or plans assessed under Tier 2, plus those projects that have submitted a Scoping Report to MD-LOT; and
- Tier 4 - All projects or plans assessed under Tier 3, projects that are considered reasonably foreseeable, plus those with a granted Agreement for Lease (AfL) or equivalent where information is available to inform the cumulative assessment and there is sufficient data confidence.

13-506. Information on each project considered as part of the shipping and navigation CEA is given in **Table 13-17**.

13-507. This CEA for shipping and navigation will consider the maximum design scenario for each of the projects, plans and activities in line with the methodology outlined in **Volume 1**, **Chapter 5: EIA Methodology**. Projects that were noted to have been operational prior to 2023 during the screening exercise and will have been taken into account within the baseline assessment, so have not been considered within the CEA for shipping and navigation, and are not included within **Table 13-17**.

Table 13-17 List of Other Developments Considered Within the CEA for Shipping and Navigation

Plan/ Proposed Offshore Development	Summary	Status	Distance from array area (km)	Distance from ECC (km)	Decommi-ssioning Dates (if relevant)	Operational by (if relevant)	Summary of Interaction with Proposed Offshore Development
Tier 1							
Onshore Elements of Buchan Offshore Wind Farm (Proposed Onshore Development)	Onshore cable circuits and structures required to allow a connection from the Proposed Offshore Development to the existing transmission network at Peterhead substation	Planned	79	0	N/A	Target 2035	N/A
Tier 2							
Morven	2,907 mW OWF, 191T, ScotWind	Planned	148.9	84.2	N/A	Target 2030	Morven sits nearly 150 km south of the Array Area and is unlikely to interact with the Proposed Offshore Development.
Cable Installation	Caledonia export cable	Planned	123.8	40.8	N/A	2030	The Caledonia export cable will run parallel to the Indicative IRC Study Area. There may be a potential increase in vessel encounters due to cable installation vessels.
Muir Mhor	798 mW OWF Float, 40T, ScotWind	Planned	90.0	57.6	N/A	Target 2030	Located southeast of the Proposed Offshore Development Array Area, Muir Mhor is unlikely to have any significant interaction with the Proposed Offshore Development.
Moray West	882 mW OWF, 60T, Existing round	Operational	87.9	85.5	N/A	Since April 2025	Moray West OWF will be operational during the Proposed Offshore Development's construction and most of its operation, but is located over 80km west of the Proposed Offshore Development, therefore little interaction is expected.
Flora	50 mW OWF Float, 50T, INTOG	Planned	80.8	28.9	N/A	Unknown	Construction vessels for Flora OWF may encounter Proposed Offshore Development vessels.
Salamander	100 mW OWF Float, 5-7T, INTOG	Planned	66.3	21.1	N/A	Expected 2029	Salamander OWF may cause some of the traffic that currently transits east of the Proposed Proposed Offshore Development Array Area to transit west of Salamander and slightly closer to the Proposed Offshore Development. There is still sufficient sea room available between the Proposed Offshore Developments and Marram Wind Farm and Green Volt to safely enable these deviations.
Cable Installation	Green volt export cable	Consented	56.4	6.6	N/A	Target 2029	The Green Volt Export Cables are expected to have been installed prior to the Proposed Offshore Development beginning construction, however potential overlap could increase Proposed Offshore Development vessel encounters.
Cable Installation	Alteration to Export Cable Burial Location (European Offshore Wind Development Centre)	Approved	55.2	43.8	N/A	Unknown	The Ossian Export Cable is over 50 km south of the Array Area and is unlikely to interact with Proposed Offshore Development.
Caledonia Offshore Wind Farm	2000 mW OWF Float, 84-140T, ScotWind	Planned	55.1	56.0	N/A	2030	Located south-west of the Proposed Offshore Development, Caledonia OWF is unlikely to interact with the Proposed Offshore Development.
Ayre Offshore Wind Farm	1,008 mW OWF Float, 40-67T, ScotWind	Planned	53.1	72.3	N/A	The Ayre OWF will be built in two stages between 2029 and 2033.	Located north-west of the Proposed Offshore Development Array Area, Ayre OWF is unlikely to

							significantly interact with the Proposed Offshore Development.
Green Volt	490-560 mW OWF Float, 35T, INTOG	Consented	43.8	36.2	N/A	Target 2029	Located southeast of the Proposed Offshore Development Array Area, Green Volt is unlikely to interact largely with the Proposed Offshore Development.
Stromar	1000 mW OWF Float, 71T, ScotWind	Planned	39.6	47.1	N/A	Early 2030s	Stromar Wind Farm is located west of the Proposed Offshore Development and may force one high density route to transit slightly further to the east (closer to the Proposed Offshore Development). Given the available sea room between the windfarms, this is unlikely to impact the Proposed Offshore Development.
Tier 3							
Marram Wind Farm	3000 mW OWF Float, 126-225T, ScotWind	Planned	24.2	24.3	N/A	2030s	Marram Wind Farm is proposed to the southeast of the Proposed Offshore Development, limiting adverse weather route options for routes to the east of the Proposed Offshore Development. The sea room between the Proposed Offshore Development and Marram Wind Farm windfarm should still be sufficient for adverse weather routeing or options for collision avoidance.
Acorn CCS Proposed Offshore Development	CO2 Export pipeline and Carbon Capture	Pre-application consultation (PAC) Agreed	80.7	0.6	N/A	Target 2030	The Acorn CCS Proposed Offshore Development may cause an increase in vessel traffic which could interact with Proposed Offshore Development vessel activity, but this will likely be constrained to the construction period.
Broadshore	900 mW OWF Float, 32-60T, ScotWind	Planned	21.2	22.4	N/A	Planned for 2030	Broad shore sits to the southwest of the Array Area, just intersecting the ECC Study Area.
Sinclair	99.45 mW OWF Float, 3-6T	Planned	16.9	20.9	N/A	Planned for 2031	Sinclair sits to the southwest of the Array Area.
Scaraben	99.45 mW OWF Float, 3-6T, INTOG	Planned	14.2	17.1	N/A	Planned for 2031	Scaraben just intersects the Array Study Area. Scaraben windfarm, in addition to the FPSO for Ross Oil Field, could force vessels to transit closer to the windfarm.
Aspen	1008 mW OWF Float, 70-100T, INTOG	Planned	71.5	61.1	N/A	Target 2028	Aspen OWF is unlikely to have any significant interaction with the Proposed Offshore Development.
SSEN Spittal – Peterhead Subsea Cable Link[1]	HVDC cable route Between Spittal and Peterhead	Planned, PAC events completed	43.9	0	N/A	Target 2029-2030	May cause additional vessel movements in proximity to Peterhead port and the ECC landfall but given the sea room this is unlikely to have a significant interaction with the Proposed Offshore Development.
Tier 4							
Bowdun Offshore Wind Farm	1,008 mW OWF, 50-60T, ScotWind	Planned	131.7	61.4	N/A	Expected 2033	Bowdun OWF sits over 130 km south of the Array Area and is unlikely to have any interaction with the Proposed Offshore Development

[1] It is understood that the Marine Licence Application for this project was submitted in January 2025. Details have been requested from MD-LOT and the Applicant, but have not been able to be provided to allow a more detailed consideration of the assessment of cumulative effects at the time of finalising the assessment, and this therefore remains as Tier 3 for assessment purposes.

CampionWind	2000 mW OWF Float, 100T, ScotWind	Planned	105.8	85.4	N/A	Target 2030	CampionWind is located over 100 km southeast of the Array Area and is unlikely to interact with the Proposed Offshore Development.

13.12.2 Maximum Design Scenario

13-508. Details of the activities and key Proposed Offshore Development components is provided in **Volume 1 Chapter 4: Project Description**. As this assessment is using the Design Envelope approach, a MDS has been selected for each cumulative impact which would lead to the greatest impact for all receptors or receptor groups, when selected from a range of values.

13-509. **Table 13-18** presents the MDS for each cumulative impact associated with the CEA for shipping and navigation, along with justification. Only impacts that would be additionally affected in the cumulative scenario have been considered. For instance, the impact of floating mooring and cable systems, WTG breakout and small movements of floating installations cannot be considered cumulatively as these impacts are localised to each Project.

Table 13-18 Maximum Design Scenarios Considered for Assessment of Likely Significant Cumulative Effects on Shipping and Navigation

Likely Significant Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
Impact on commercial and ferry routes, including re-routeing/deviation of lifeline services	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** • Marram Wind Farm • Scaraben Wind Farm • Green Volt Wind Farm • Stromar Wind Farm • Ayre Wind Farm	Marram Wind Farm and Green Volt will limit routing options to the east of the Proposed Offshore Development. Scaraben limits routing options to the west of the Proposed Offshore Development. Stromar and Ayre, alongside the Proposed Offshore Development, constrain the east-west route to/from Pentland Firth.
Impact on Commercial Fishing Safety	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed projects	The greatest number of windfarms over the longest duration, would require the most deviation of fishing vessels and lead to the greatest amount of subsea cables and moorings which could increase snagging, therefore having the greatest potential for impacts on commercial fishing vessels.
Impact on Recreational Vessel Safety	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** • Salamander Wind Farm • Flora Wind Farm	The windfarms close to shore are closer to the most recreational activity and would therefore have the greatest potential for impacts on recreational vessels.
Impact on Risk of Allision	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed OWF projects	The greatest number of windfarms over the longest duration would mean the largest number of WTGs and infrastructure, and therefore the highest potential for increases in the risk of allision/contact.
Impact on Risk of Collision	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed projects	The greatest number of projects over the longest duration would reduce available sea room and cause the most Proposed Offshore Development-vessel traffic, leading to high potential for increases in collision risk.
Impact on Risk of Grounding	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:**	Cable and pipelines close to shore and close to the Proposed Offshore Development ECC will reduce UKC in the area and cause some vessels to deviate

Likely Significant Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				• SSEN Spittal – Peterhead Subsea Cable Link • Green Volt Export Cable • Caledonia Export Cable • Acorn CCS Pipeline	closer to shore and increase the risk of grounding either on a cable or pipeline or on the seabed.
Impact of Towage Operations	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed projects with target operation 2029-2035 (overlapping construction period)	The greatest number of windfarms with overlapping construction periods would have the greatest risk of simultaneous towage operations and a cumulative impact of towage operations.
Impact on Search and Rescue capabilities	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed projects	The greatest number of windfarms over the longest duration would cause the highest potential for increases in incidents and therefore for impact on SAR capabilities.
Impact on Communications, Radar and Positioning Systems	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** All proposed projects	The greatest number of windfarms over the longest duration has the greatest number of WTGs and therefore potential to exacerbate the impacts on marine navigation, communications and positioning systems.
Impact on Under Keel Clearance	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** • SSEN Spittal – Peterhead Subsea Cable Link • Green Volt Export Cable • Caledonia Export Cable • Acorn CCS Pipeline	Maximum number of cable and pipelines close to shore and close to the Proposed Offshore Development ECC will have maximum impacts on UKC in the area.
Impact on Access to Ports and Harbours	✓	✓	✓	**Construction, operation and maintenance, and decommissioning of:** • SSEN Spittal – Peterhead Subsea Cable Link	Windfarm arrays are sufficiently far offshore not to affect ports and harbours cumulatively with the Project (any impacts caused by projects closer to shore will be localised to those projects). However,

Likely Significant Impact	Phase			Maximum Design Scenario	Justification
	C	O	D		
				• Green Volt Export Cable • Caledonia Export Cable • Acorn CCS Pipeline	the maximum number of cable and pipelines close to shore and close to the Proposed Offshore Development ECC have the greatest potential for impacting access to the ports.

13.12.3 Cumulative Effects Assessment

13-510. An assessment of the likely significance of the cumulative effects of the Proposed Offshore Development upon shipping and navigation receptors arising from each identified impact is given in the following sections.

13-511. During consultation, NorthLink Ferries and NLB representatives raised concern about the potential cumulative impact of multiple IRC platforms within the Study Area. However, at the time this assessment was undertaken, no other projects include or dismiss the inclusion of an IRC platform within the available documentation. In the consultation booklet for Marram Wind Farm (MarramWind, 2024), it is noted that an additional offshore structure located at the mid-point between the windfarm site and where the cables make landfall may be required in the event that HVAC technology is used. However, given that the exact export cable corridor for Marram Wind Farm and therefore the potential IRC platform location is currently not confirmed, a cumulative assessment is not possible within this application.

13.12.3.1 Construction Phase

13-512. The Applicant aims to begin construction of the Proposed Offshore Development by the indicative date of 2029, with the aim of being fully operational in 2035 based on a construction programme of up to 6 years. Therefore, this section considers the impacts of the Proposed Offshore Development alongside any projects identified in **Table 13-17**, proposed to be undergoing construction, operation and maintenance, or decommissioning within the shipping and navigation cumulative screening region of 92.6 km (50 nm) (as recommended by the UK CoS in Scoping Opinion [**Table 13-3**]) etween 2029 and 2035.

Impact 1 Impact on commercial and ferry routes, including rerouteing/deviation of lifeline services

13-513. The assessment of cumulative routeing as undertaken in the NRA showed that some of the existing commercial and passenger ferry traffic in the area could be displaced during construction on a cumulative basis. As presented by the MDS, all projects (other than Marram Wind Farm, Scaraben, Green Volt, Stromar and Ayre OWFs) are unlikely to impact any key commercial or passenger vessel routes that are impacted by the Proposed Offshore Development, due to their distance from the Project and the high density vessel routes identified in the NRA (Volume 3, Appendix 13.1). All of these proposed developments are anticipated to be under-going construction or be in operation for some duration during the Proposed Offshore Development construction.

13-514. The Marram Wind Farm and Green Volt windfarms proposed to the southeast of the Array Area means that northeast-southwest routes to the east of the Proposed Offshore Development will have limited route options in adverse weather conditions, and many will choose to transit between Marram Wind Farm and the Proposed Offshore Development given the smaller sea room between Marram Wind Farm and Green Volt, particularly if the construction periods of Marram Wind Farm and Green Volt were to overlap and additional 500m safety zones were to extend beyond each project boundary. However, 500m would be less than the typical operating distances of vessels from the windfarm boundaries so are unlikely to have much additional impact. They will also be temporary and localised, as well as monitored and promulgated (through NtMs [EM22], and periodic hydrographic surveys [EM29]), further minimising impacts and risks. Nevertheless, these are high density routes, primarily used by commercial vessels on passage between Aberdeen/Peterhead and the

northern North Sea, and tug and service vessels transiting to and from the oil and gas fields located to the north-east of the Proposed Offshore Development.

13-515. The presence of the Stromar and Ayre windfarms to the west and north-west of the Proposed Offshore Development, in addition to the Proposed Offshore Development, would also constrain the high-density commercial route that transits east-west to/from Pentland Firth.

13-516. In addition, the north-south NorthLink vessel route to the west of the Array Area would be limited between the Scaraben windfarm and the FPSO for Ross Oil Field, with a 5-7 nm gap between them. It is possible that this pinch-point to the south of the Proposed Offshore Development could force vessels to transit closer to the windfarm. NorthLink operate daily sailings and therefore this impact will also be felt frequently. However, the effect of the Proposed Offshore Development on this route is limited, with the impact more driven by Scaraben and the Ross Oil Field. There are also route options to the east and west of the pinch-point.

13-517. Export cables proposed for other windfarms to the southeast and southwest of the Proposed Offshore Development Array Area may cause increased vessel activity due to cable installation vessels and cause ferries or commercial vessels to occasionally deviate from a typical route to avoid collisions, potentially transiting closer to the Proposed Offshore Development than they would otherwise choose. A Navigation Safety and Vessel Management Plan (NSVMP), embedded in the Proposed Offshore Development (EM17, **Table 13-15**) will minimize the impact of these vessels on high density routes (see the Proposed NSVMP PMP 3).

13-518. Despite these likely significant effects to routing in the cumulative scenario, it is anticipated that there will still be adequate sea room (> 4nm) to enable vessels to maintain an adequate Closest Point of Approach (CPA) from other vessels and infrastructure, and is compliant with MGN654 (MCA, 2021) and PIANC (2018) guidance. This means that any necessary minor deviations could still be undertaken safely without significant increases to journey distances. The vessel traffic analysis and cumulative routeing assessment presented in the NRA (Volume 3, Appendix 13-1) explains that the most significant impact would likely be to the route that passes through the eastern side of the proposed Marram Wind Farm and may, in the cumulative scenario, choose to transit through the area between Marram Wind Farm and Green Volt. This route deviation enables a 2 nm CPA to be maintained and requires approximately 6 nm additional transit distance, which corresponds to approximately a 3% increase of the total route distance. The requirement to ensure third party vessels are aware of construction activities and display information on charts is also embedded in the Proposed Offshore Development design (EM22) which will enable advance passage planning. Other relevant embedded mitigation measures include site marking and charting (EM18), and a Lighting and Marking Plan (LMP) (EM16) which would be agreed prior to construction (see Proposed LMP PMP 5).

13-519. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The likely effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the available sea room around the proposed projects to enable safe deviations and the site marking and charting and promulgation of information.. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been

identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 2 Impact on Commercial Fishing Vessel Activity

13-520. Fishing vessel activity throughout the Study Area is presented in **Section 6.2.2.5** of the NRA and further information is located in **Volume 2 ,Chapter 11: Commercial Fisheries**. It is noted in the MDS that the presence of all projects undergoing construction or operation together will have the greatest impact on commercial fishing vessels, as this would generate the greatest number of subsea cables and moorings and, therefore, increase snagging risk.

13-521. Commercial fishing vessels may be impacted in the cumulative scenario, particularly due to Marram Wind Farm. A lot of the fishing vessel activity through the Array Area is transit to fishing grounds to the east of Marram Wind Farm. In the cumulative scenario, many fishing vessels which may have deviated to the east of the Proposed Offshore Development to avoid Proposed Offshore Development activities will be further constrained by Marram Wind Farm and forced to transit between the Marram Wind Farm and the Proposed Offshore Development, closer to the Proposed Offshore Development activities than they likely would have chosen to transit in the Proposed Offshore Development-alone scenario.

13-522. Commercial fishing vessels may also be impacted in the cumulative scenario due to the Broadshore Hub, including Broadshore, Scaraben and Sinclair. A lot of fishing vessel activity is present southwest of the Array Area, between the Array Area and Scaraben. In the cumulative scenario, many of these vessels may choose the deviate further southwest of these Broadshore Hub projects, to avoid the safety zones that may be in place for these Tier 3 Projects and the Proposed Offshore Development. However, this deviation is still considered relatively minor and the primary fishing grounds further north will still be available.

13-523. The installation of export cables proposed for other windfarms to the southeast and southwest of the Proposed Offshore Development Array Area, as well as the installation of the HVDC cable proposed for between Spittal – Peterhead to the west of the Proposed Offshore Development Array Area (that also overlaps the ECC near to landfall) could cause commercial fishing vessels to deviate from their typical route to avoid cable installation vessels where construction timelines interact.

13-524. However, the >4 nm separation distances between projects area considered to remain sufficient for safe navigation and collision avoidance, by enabling vessels to maintain an adequate Closest Point of Approach (CPA) from other vessels and infrastructure, and is compliant with MGN654 (MCA, 2021) and PIANC (2018) guidance. Cumulative impacts are therefore anticipated to be limited to the discrete areas where construction works are ongoing simultaneously which is likely to be short-term in nature. Moreover, where additional deviations are required to avoid safety zones during construction periods, these are not expected to be major deviations.

13-525. As a result, considering the number of fishing vessels in the area alongside relevant mitigation measures including the FMMCP (EM25), Promulgation of Information (EM22), and the NSVMP (EM17), the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the available sea room and the Cable Plans (EM9 and EM47) that are

embedded in the Proposed Offshore Development and expected to be similarly embedded in the surrounding wind farm projects. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 3 Impact on Recreational Activity

13-526. Recreational vessel activity throughout the Study Area is presented in **Section 6.2.2.4** of the NRA (**Volume 3, Appendix 13.1**). It is noted in the MDS that, with the exception of Salamander and Flora Wind Farm, all the proposed wind farm projects are far enough offshore that they will have very little cumulative impact on recreational vessels. The Spittal – Peterhead HVDC Cable is proposed to overlap the ECC closer to shore and will therefore, alongside Flora and Salamander windfarms, have the greatest potential for impacts on recreational vessels. Despite this, very little information is currently known about the timescale for the proposed Flora Wind Farm, and both of the windfarms are also outside the area of highest recreational vessel density.

13-527. Despite minimal activity, there is the potential that some of the recreational vessels transiting near the windfarms will have to deviate around the projects, or be impacted by the construction activity and the increase in vessels associated with this. However, there would be a very limited number of recreational vessel transits likely to be affected, only minor deviation would be required, and the available sea room is considered to be sufficient to enable safe deviation and collision avoidance, if required.

13-528. Therefore, the primary risk to recreational vessel in this cumulative scenario is the installation of the Spittal-Peterhead HVDC Cable during the construction of the Proposed Offshore Development, as this could increase the risk of recreational vessel grounding by reducing the water depth or causing deviations closer to shore to avoid multiple project vessels. However, there is considerable sea room and water depths around the ECC, further away from landfall, and therefore the risk of grounding is not expected to be significantly increased in this scenario.

13-529. It is also noted that recreational craft currently tend to stay slightly further out from the shore, similar to passenger tracks, due to waves that can be generated by certain wind and tidal conditions near Rattray Head, so grounding of these vessels is unlikely.

13-530. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Negligible/Minor adverse significance. A **Minor** rather than Negligible effect has been determined given the potential for some impact to recreational vessels in the cumulative scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 4 Impact on Risk of Allision

13-531. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced around the Project and/or be required to transit between multiple projects due to surrounding windfarms and/or cable installations/maintenance. Impacts on routeing may in turn lead to increased allision risk.

13-532. It is noted in the MDS that all the proposed projects could impact the risk of allision as this cumulative scenario would generate the maximum number of structures for vessels to allide with.

13-533. However, in the same way that a Lighting and Marking Plan (LMP) is embedded within the Proposed Offshore Development (see Proposed LMP PMP 5) (EM16), all cumulative developments will be required to implement lighting and marking in agreement with the NLB and in compliance with IALA G1162 (IALA, 2021). These discussions will include consideration of the current cumulative understanding, in addition to surface navigation and allision risk, and will also take place with the MCA and NLB when agreeing the layouts for each Proposed Offshore Development (EM46).

13-534. Nevertheless, in the event of an allision as a result of these deviations, while the most likely outcome is minor damage and/or minor injuries, it is feasible that a worst-case allision involving a larger vessel might result in WTG collapse, or damage to mooring line configurations, and/or holing and eventual flooding of a vessel and potential loss of life, though this is considered unlikely given the marking and charting of the site (EM18) and the development of an ERCoP (EM30).

13-535. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that several mitigation measures are embedded in the Proposed Offshore Development to minimise both the likelihood and consequence of an allision in the cumulative scenario (including site marking and charting [EM18], lighting and marking [EM16], safety zones [EM19], and the provision of an ERCoP [EM30]). No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor**, which is not significant in EIA terms.

Impact 5 Impact on Risk of Collision

13-536. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced and/or be required to transit between multiple windfarms, due to surrounding windfarms and/or cable installations/maintenance. Impacts on routeing may in turn lead to increased collision risk.

13-537. It is noted in the MDS that all the proposed projects could impact the risk of collision as this cumulative scenario would generate the minimum amount of available sea room (maximum vessel constraint) and maximum additional project vessel traffic.

13-538. However, the applicant will establish appropriate vessel management systems and marine coordination to manage the potential for increase encounters with project vessels, as per the NSVMP (EM17). These encounters will also be managed through COLREGs and SOLAS.

13-539. With regard to the available sea room, the >4 nm separation distances between projects are anticipated to be sufficient to safely accommodate any required deviations, and collision avoidance, by enabling vessels to maintain an adequate Closest Point of Approach (CPA) from other vessels and infrastructure, and is compliant with MGN654 (MCA, 2021) and PIANC (2018) guidance. .

13-540. Nevertheless, in the event of a collision, whilst the most likely outcome is minor damage and/or minor injuries, it is feasible that a worst-case collision involving a larger vessel might

result in vessel holing and eventual flooding and capsize and potential loss of life. However, analysis of MAIB data suggests that, overall, < 1% of collisions would result in loss of life and none of the recorded navigational incidents across the UK sector associated with UK offshore windfarms between 2010 and 2019 resulted in a fatality.

13-541. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and site marking and charting [EM18] and promulgation of information [EM22] will enable advance passage planning around any construction activities and safety zones No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 6 Impact on Risk of Grounding

13-542. Cable and pipeline installation activity may lead to a potential increase in the risk of grounding, either on the cables and pipelines themselves, or on the seabed as a result of changes to vessel routeing to avoid the installation activity.

13-543. Analysis of vessel draughts undertaken for the Project-alone scenario in the NRA (Volume 3, Appendix 13.1) demonstrates that very few vessels with a draught >6 m currently transit within 3 nm of the landfall. Within the 2023 AIS data used in to define the baseline environment, the closest observed vessel with draught over 6m was transiting 1.5 nm away from the landfall where the depth exceeds 22 m. Furthermore, even in the event of simultaneous pipeline/cable installation activity within the Study Area, there is considerable sea room and water depths between the cables, further away from landfall, and therefore the risk of grounding is not expected to be significantly increased due to the Proposed Offshore Development in combination with the surrounding projects. The promulgation of information via NtMs (EM22) will ensure any small craft that would typically transit close to the cable/pipeline landfalls are aware of the activity, and enable them to safely passage plan in advance.

13-544. Nevertheless, while unlikely, it is possible that a cable or pipe-laying vessel with a draught > 6 m could ground during the installation process, although this would be considered an incident associated with the Proposed Offshore Development, as opposed to an incident occurring to a third-party vessel as a result of the Proposed Offshore Development. Therefore, this incident should be mitigated through the NSVMP (EM17) which will set the requirements to which the project vessels must adhere to. It is anticipated that projects in the area will have a similar plan in place, embedded within the project design.

13-545. Moreover, other embedded mitigation measures detailed in **Table 13-15**, including cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as the obtainment of detailed seabed data through periodic hydrographic surveys (EM29) should ensure that the cable laying vessel is not expected to operate in water depths which are too shallow, in order to reduce the risk of grounding. It is anticipated that these or similar measures will also be embedded into the other projects.

This should limit the need for vessels to deviate around the nearshore ECC and, therefore, reduce the risk of them transiting closer to shore and grounding on the seabed.

13-546. However, in the unlikely event of a grounding, while the worst-case scenario could involve loss of small craft, with a single fatality, the most likely outcome is minor injuries and minor adverse publicity.

13-547. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any construction activities and safety zones. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 7 Impact of Towage Operations

13-548. There will be significant towage operations required throughout the construction phases of the Proposed Offshore Development in combination with the other nearby projects, as WTGs are taken to and from the arrays. These operations may require result in vessels being Restricted in Ability to Manoeuvre (RAM). These operations have potential to affect collision on passage; however the construction ports have not been determined so the route taken is not known. The towage operations will however be focused around the Array Area and so it is possible to consider the effects on vessel traffic in the vicinity.

13-549. As highlighted within **Section 13.11.1.6**, details on the O&M activities for the Proposed Offshore Development are not fully developed but the greatest potential for interactions with vessel routeing is if the tow is on a coastal route following the current traffic routeing or crossing it to reach the Array Area. This would however be treated as a standard traffic interaction by other vessel that will follow international regulations should risk of collision exist.

13-550. While it is highly likely that the construction of the Proposed Offshore Development will slightly overlap with other project construction phases, there are multiple embedded mitigation measures for towage operations detailed in **Table 13-15**, many of which would also be anticipated to be embedded within the other proposed windfarms (or similar measures). This includes requirements for towage contractors to undertake Risk Assessment Method Statements (RAMS) for the operation. The RAMS consider each specific operation to identify areas of potential risk such as vessel traffic, weather conditions and assign appropriate measures such as abort points and limitations. This is further controlled by the NSVMP (EM17) which will prescribe the requirements for Proposed Offshore Development vessel passage planning, securing the management and coordination of vessel activities, as well as communications and reporting requirements.

13-551. Furthermore, in the event that the cumulative towage operations impact passing vessel traffic, the most likely outcome is the same as anticipated for the project-alone scenario, whereby vessels are RAM and experience minor delays on their route. While a worst-case scenario could involve vessel collision, with a fatality, this is considered very unlikely given the embedded mitigation measures highlighted above.

13-552. As a result, the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any towage operations. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms

Impact 8 Impact on Search and Rescue Capabilities

13-553. It is noted in the MDS that all the proposed projects could impact SAR capabilities as this cumulative scenario would generate the maximum number of vessels and personnel in the Study Area and minimum amount of sea room for them to operate in, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures.

13-554. However, as per the incident assessment conducted within Volume 3, Appendix 13.1: NRA, the baseline incident rates are low. Furthermore, there would be additional resources available at other projects and, as a result, there is not considered likely to be a notable effect on emergency response resources on a cumulative level.

13-555. In the event of SAR being required, all wind farm developments will be required to agree a layout with the MCA, in alignment with MGN 654 (EM46], and ensure suitable SAR access is available. Moreover, SAR operations within a given development will be localised to the area of the operation.

13-556. As a result, the magnitude of the impact is deemed to be **Negligible,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Negligible/Minor adverse significance. A **Minor** rather than Negligible effect has been determined given that there is the potential for a reduction in SAR capabilities, albeit a very small reduction. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 9 Impact on Communications, Radar and Positioning Systems

13-557. The likely significant effects on communication, radar and positioning systems are outlined in **Section 13.11.1.8**. It is noted in the MDS that all the proposed projects could impact equipment used for navigation, collision avoidance and communications, as well as masking sound signals from vessels or AtoNs. This is because this cumulative scenario would generate the greatest number of WTGs and therefore the largest potential to exacerbate the impacts on marine navigation, communications and positioning systems.

13-558. However, while the increased amount of ORE infrastructure may increase the frequency with which some of the impacts are felt, negative impacts are still very unlikely to be felt regularly given the separation distances (>4 nm) that will be available between projects, enabling vessels to still maintain a sufficient distance (1-2 nm) from the WTGs to reduce the impacts, such as on marine radar.

13-559. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Minor/moderate

adverse significance. A **Minor** rather than moderate effect has been determined given that there is expected to be a negligible increase compared to in the project-alone scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified that would be cost-proportionate to the level of risk reduction, so the LSE is considered ALARP and the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 10 Impact on Under-Keel Clearance

13-560. Cable and pipeline installation activity may lead to a potential reduction in UKC, particularly close to landfall. Although cable and pipeline burial (the Proposed Offshore Development has a target burial depth of 1.5 m) mitigates the risk of snagging post-construction, and the Cable Plan (EM9) will be informed by a CBRA to ensure these risks are adequately addressed for the types of gear used within the ECC Study Area, in some areas, cable burial may not be practicable, and they must be protected by other means, such as standard rock berm/concrete mattresses. Where this is the case, the depth of water may be reduced, alongside the Under Keel Clearance (UKC) of vessels. The MCA and RYA recommend that any protection should not reduce the depth of water (referenced to Chart Datum) by more than 5%.

13-561. The proposed export cable for Green Volt Offshore Windfarm has two landfall points just south of the Proposed Offshore Development landfall., with a maximum cable protection height of 1.5m, thereby creating further areas of reduced UKC close to shore between Rattray Head and Peterhead. The Caledonia Export Cable landfall is proposed further north-west, between Buckie and Fraserburgh and therefore, any UKC reduction as a result is unlikely to have any cumulative impact with the proposed ECC and the Green Volt Export Cable, especially given the low traffic density around the Caledonia landfall. However, the Acorn CCS Pipeline Project could have landfall at St Fergus Gas Terminal, in a very similar location to the ECC. Although this will further reduce the water depth in the area, the reduction in UKC is unlikely to exceed 5% within 3 nm of the shore, and very few deep-draught vessels transit in this area.

13-562. There is sufficient sea-room north of the landfall for vessels to transit further away from the landfall, with depths exceeding 36 m, in line with MCA and RYA recommendations, and the promulgation of information (EM22) will enable vessels to safety passage plan to the north oreast to avoid the reduction in UKC in this area as a result of the cable and pipeline installation activities.

13-563. Furthermore, the outcome in the event of a significant reduction in UKC, and a vessel snagging on an export cable, is also anticipated to be the same as during the project-alone scenario, with the most likely outcome consisting of minor injuries and minor vessel damage, and the worst credible outcome involving a single fatality.

13-564. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been

identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 11 Impact on Access to Ports and Harbours

13-565. There are no cumulative developments that are anticipated to pose a cumulative risk to access to Ports and Harbours in conjunction with the Proposed Offshore Development. The build out of the surrounding proposed windfarm arrays may increase project associated construction vessel traffic transiting to and from local harbours, however each project would be required to manage project traffic on an individual basis with the ports and harbours anticipated to provide support to those projects.

13-566. It should also be noted that all cumulative developments can be expected to abide by their own embedded mitigations in line with industry standards and regulations. These are likely to include: an ERCOP, AtoNs, navigation in compliance with COLREGS and SOLAS, appropriate marking on nautical charts, and compliance with MCA MGN 654 among others.

13-567. The cumulative additional installation of cable and pipelines close to the ECC landfall would increase the volume of project traffic, although it is not anticipated to notably increase overall baseline traffic levels in the area. Moreover, as is the case for the windfarm array scenario, the management of that project traffic would be managed on an individual project basis and does not pose a significant cumulative risk in conjunction with the Proposed Development.

13-568. As a result, given the traffic volumes serving the Port of Fraserburgh and Peterhead, and the minimal amount of disruption that would likely be experienced in the event that access is impacted, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

13.12.3.2 Operation and Maintenance Phase

13-569. The Project aims to be fully operational in 2035. Therefore, this section considers the impacts of the Proposed Offshore Development alongside any projects identified in **Table 13-17,** that are proposed to be undergoing construction, operation and maintenance, or decommissioning within the shipping and navigation cumulative screening region between 2035 and 2070.

Impact 12 Impact on commercial and ferry routes, including rerouteing/deviation of lifeline services

13-570. The assessment of cumulative routeing as undertaken in the NRA showed that some of the existing commercial and passenger ferry traffic in the area could be displaced during the operation and maintenance phase.

13-571. As presented by the MDS, all projects other than Marram Wind Farm, Scaraben, Green Volt, Stromar and Ayre OWFs are unlikely to impact any key commercial or passenger vessel routes. All of these proposed developments are anticipated to be under-going construction or be in operation for some duration during the Proposed Offshore Development O&M phase.

13-572. It is noted that full build-out of the Proposed Offshore Development during O&M will have a slightly larger impact on routing than the construction phase. Nevertheless, given the sea room available for deviations and the small additional distances, it is anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-573. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of **Minor** adverse significance. A Minor rather than moderate effect has been determined given the available sea room and embedded mitigations. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 13 Impact on Commercial Fishing Vessel Activity

13-574. Fishing vessel activity throughout the Study Area is presented in **Section 6.2.2.5** of the NRA and further information is located in **Volume 2 , Chapter 11: Commercial Fisheries**. It is noted in the MDS that the presence of all projects undergoing construction or operation together will have the greatest impact on commercial fishing vessels, as this would generate the greatest number of subsea cables and moorings and, therefore, increase snagging risk.

13-575. It is noted that the full build-out of the Proposed Offshore Development during O&M will have the largest impact on commercial fishing vessels given the greatest presence of surface and subsurface infrastructure. Nevertheless, given the 4 nm minimum separation distances enabling safe deviations and the small additional distances that would be required, it is anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-576. As a result, considering the requirement for the FMMCP (EM25), Promulgation of Information (EM22), and the NSVMP (EM17), the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the available sea room and the Cable Plans (EM9 and EM47) that are embedded in the Proposed Offshore Development and expected to be similarly embedded in the surrounding Tier 3/4 Projects. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 14 Impact on Recreational Activity

13-577. Recreational vessel activity throughout the Study Area is presented in **Section 6.2.2.4 of the NRA** (**Volume 3, Appendix 13.1**). It is noted in the MDS that, with the exception of Salamander and Flora Wind Farm, all the proposed wind farm projects are far enough offshore that they will have very little cumulative impact on recreational vessels. The Spittal – Peterhead HVDC Cable is proposed to overlap the ECC closer to shore and will therefore, alongside Flora and Salamander windfarms, have the greatest potential for impacts on recreational vessels. Despite this, very little information is currently known about the timescale for the proposed Flora Wind Farm, and both of the windfarms are also outside the area of highest recreational vessel density.

13-578. It is noted that full build-out of all the proposed developments will have the largest impact on recreational vessels. Nevertheless, given the frequency of recreational vessel transits this far offshore, the sea room available for deviations and the small additional distances, it is anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-579. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Negligible/Minor adverse significance. A **Minor** rather than Negligible effect has been determined given the potential for some impact to recreational vessels in the cumulative scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 15 Impact on Risk of Allision

13-580. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced around the Project and/or be required to transit between multiple projects due to surrounding windfarms and/or cable installations/maintenance. Impacts on routeing may in turn lead to increased allision risk. It is noted in the MDS that all the proposed projects could impact the risk of allision as this cumulative scenario would generate the maximum number of structures for vessels to allide with.

13-581. It is noted that full build-out of the proposed offshore developments will have the largest impact on allision. Nevertheless, the embedded mitigations and the >4 nm separation distances between projects will enable any required deviations to be undertaken safely, enabling advance passage planning, providing adequate room for collision avoidance, and by allowing vessels to maintain an adequate Closest Point of Approach (CPA) from other vessels and infrastructure, and is compliant with MGN654 (MCA, 2021) and PIANC (2018) guidance. It is therefore anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-582. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that several mitigation measures are embedded in the Proposed Offshore Development to minimise both the likelihood and consequence of an allision in the cumulative scenario (including site marking and charting [EM18], lighting and marking [EM16], safety zones [EM19, and the provision of an ERCoP [EM30]). No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor**, which is not significant in EIA terms.

Impact 16 Impact on Risk of Collision

13-583. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced and/or be required to transit between multiple windfarms, due to surrounding windfarms and/or cable installations/maintenance. Impacts on routeing may in turn lead to increased collision risk.

13-584. It is noted that full build-out of the projects will have the largest impact on collision, as this cumulative scenario would generate the minimum amount of available sea room (maximum vessel constraint) and maximum additional project vessel traffic. Nevertheless, given the embedded mitigations and the sea room available for deviations and collision avoidance, it is anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-585. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (EM17, see the Proposed NSVMP PMP 3) will minimise the impact of project vessels on established routes, and site marking and charting (EM18) and promulgation of information (EM22) will enable advance passage planning around any construction activities and safety zones. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 17 Impact on Risk of Grounding

13-586. Cables and pipelines may lead to a potential increase in the risk of grounding, either on the cables and pipelines themselves, or on the seabed as a result of changes to vessel routeing to avoid any maintenance activity.

13-587. Given the water depths, further offshore, grounding is only really a risk in the vicinity of the cable and pipeline landfalls. Given that there will likely be fewer project vessels in this region during the operation and maintenance phases, last minute route deviations are unlikely to be required. As a result, vessels are unlikely to have transit closer to shore and ground on the seabed as a result of the cumulative cable and pipeline developments. Therefore, the impact is considered similar to that for the Project-alone scenario whereby grounding is most likely to occur from a project maintenance vessel with a large draught grounding on the pipeline or cable. However, each project would be required to manage this on an individual basis with the risk managed through embedded mitigation measures similar to those detailed in Table 13-15. For example, cable burial and additional protection where necessary (as part of the Cable Plan (EM9)) and the provision of cable installation methodology as part of the Cable Specification and Installation Plan (EM47), as well as the obtainment of detailed seabed data through periodic hydrographic surveys (EM29) should ensure that the cable/pipeline maintenance vessels are not expected to operate in water depths which are too shallow, in order to reduce the risk of grounding.

13-588. However, in the unlikely event of a grounding, while the worst-case scenario could involve loss of small craft, with a single fatality, the most likely outcome is minor injuries and minor adverse publicity.

13-589. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any maintenance activities and safety zones. No additional mitigation above

the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 18 Impact of Towage Operations

13-590. There may be towage operations required throughout the operational phases of the Proposed Offshore Development in combination with the other nearby projects, as WTGs are taken to and from the arrays for maintenance. These operations may require result in vessels being Restricted in Ability to Manoeuvre (RAM). These operations have potential to affect collision on passage The greatest potential for interactions with vessel routeing is if the tow is on a coastal route following the current traffic routeing or crossing it to reach the Array Area.

13-591. As highlighted within **Section 13.11.1.6**, details on the O&M activities for the Proposed Offshore Development are not fully developed, but there is substantial embedded mitigation in place covering interactions between vessels on passage.

13-592. While it is highly likely that the operational of the Proposed Offshore Development will overlap with other project operational phases, towage operations will be less frequent and there are multiple embedded mitigation measures for towage operations detailed in **Table 13-15**, many of which would also be anticipated to be embedded within the other proposed windfarms (or similar measures). The magnitude of impact in the cumulative scenario is therefore considered the same as, or better than during the construction phase.

13-593. Furthermore, in the event that the cumulative towage operations impact passing vessel traffic, the most likely outcome is the same as anticipated for the project-alone scenario, whereby vessels are RAM and experience minor delays on their route. While a worst-case scenario could involve vessel collision, with a fatality, this is considered very unlikely given the embedded mitigation measures highlighted above.

13-594. As a result, the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any towage operations. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms

Impact 19 Impact on Search and Rescue Capabilities

13-595. As identified in the MDS, all the proposed projects could impact SAR capabilities given that this cumulative scenario would generate the maximum number of vessels and personnel in the Study Area and minimum amount of sea room for them to operate in, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures.

13-596. It is noted that, while the operational phase of the projects will have fewer project vessels transiting in the area and therefore a lower risk of incidents, the smaller presence of project vessels will also form an reduced resource to respond to any incidents in the area, both in terms of incidents associated with the Proposed Offshore Development (i.e. self-help resources), but also incidents occurring to third party vessels outside of the Proposed

Offshore Development site. Therefore, given the embedded mitigations and overall low baseline incident rates, it is anticipated that the residual effect will remain similar to the construction phase of the Proposed Offshore Development.

13-597. As a result, the magnitude of the impact is deemed to be **Negligible,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance. A Minor rather than Negligible effect has been determined given that there is the potential for a reduction in SAR capabilities, albeit a very small reduction. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 20 Impact on Communications, Radar and Positioning Systems

13-598. The likely significant effects on communication, radar and positioning systems are outlined in **Section 13.11.1.8**. It is identified in the MDS that all the proposed projects could impact equipment used for navigation, collision avoidance and communications, as well as masking sound signals from vessels or AtoNs. This is because this cumulative scenario would generate the greatest number of WTGs and therefore the largest potential to exacerbate the impacts on marine navigation, communications and positioning systems.

13-599. It is noted that full build-out of the proposed offshore developments will have the largest impact on communications and radar. Nevertheless, given the embedded mitigations and the sea room available, it is anticipated that the residual effect will remain the same as during the construction phase of the Proposed Offshore Development.

13-600. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that there is expected to be a negligible increase compared to in the project-alone scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 21 Impact on Under-Keel Clearance

13-601. Cables and pipelines in the Study Area may lead to a potential reduction in UKC, particularly close to landfall. Although cable and pipeline burial (the Proposed Offshore Development has a target burial depth of 1.5 m) mitigates the risk of snagging post-construction, and the Cable Plan (EM9) will be informed by a CBRA to ensure these risks are adequately addressed for the types of gear used within the ECC Study Area, in some areas, cable burial may not be practicable, and they must be protected by other means, such as standard rock berm/concrete mattresses. Where this is the case, the depth of water may be reduced, alongside the Under Keel Clearance (UKC) of vessels.

13-602. During the operational phase of the projects, the reduction of UKC due to the Green Volt export cable and Acorn CCS Pipeline in addition to the Proposed Offshore Development is anticipated to impact vessels (both transiting and fixed fishing gear vessels) with the same or smaller frequency as is anticipated during the construction phase, given the height of the cable protection and available sea room remains the same, and there are fewer project vessel movements to increase deviations close to landfall.

13-603. Furthermore, the outcome in the event of a significant reduction in UKC, and a vessel snagging on an export cable, is also anticipated to be the same as during the project-alone scenario, with the most likely outcome consisting of minor injuries and minor vessel damage, and the worst credible outcome involving a single fatality.

13-604. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that promulgation of information (EM22) and site marking and charting (EM18) will enable safe passage planning north and/or east of the proposed pipelines and cables where the depths are shallow and that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 22 Impact on Access to Ports and Harbours

13-605. There are no cumulative developments that are anticipated to pose a cumulative risk to access to Ports and Harbours in conjunction with the Proposed Offshore Development in the operational phase. The build out of the surrounding proposed windfarm arrays may increase project associated maintenance vessel traffic transiting to and from local harbours, however each project would be required to manage project traffic on an individual basis with the ports and harbours anticipated to provide support to those projects.

13-606. It should also be noted that all cumulative developments can be expected to abide by their own embedded mitigations in line with industry standards and regulations. These are likely to include: an ERCOP, AtoNs, navigation in compliance with COLREGS and SOLAS, appropriate marking on nautical charts, and compliance with MCA MGN 654 among others.

13-607. The cumulative additional development of cable and pipelines close to the ECC landfall is not anticipated to notably increase overall baseline traffic levels in the area, particularly during operation. Moreover, as is the case for the windfarm array scenario, the management of that maintenance vessel traffic would be managed on an individual project basis and does not pose a significant cumulative risk in conjunction with the Proposed Development.

13-608. As a result, given the traffic volumes serving the Port of Fraserburgh and Peterhead, and the minimal amount of disruption that would likely be experienced in the event that access is impacted, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms

13.12.3.3 Decommissioning Phase

13-609. The anticipated lifespan of the Proposed Offshore Development is 35 years. Therefore, this section considers the impacts of the Proposed Offshore Development alongside any other projects proposed to be undergoing construction, operation and maintenance, or decommissioning within the cumulative screening region between following 2070.

Impact 23 Impact on commercial and ferry routes, including rerouteing/deviation of lifeline services

13-610. The assessment of cumulative routeing as undertaken in the NRA showed that some of the existing commercial and passenger ferry traffic in the area could be displaced during the decommissioning phase.

13-611. As presented by the MDS, all projects other than Marram Wind Farm, Scaraben, Green Volt, Stromar and Ayre OWFs are unlikely to impact any key commercial or passenger vessel routes. All of these proposed developments are anticipated to be under-going construction or be in operation for some duration during the Proposed Offshore Development decommissioning phase.

13-612. It is noted that that the impact on routeing will reduce as decommissioning progresses and the extent of structures within the Array Area reduces. Nevertheless, given the available sea room during previous phases, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development.

13-613. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of **Minor** adverse significance. A Minor rather than moderate effect has been determined given the available sea room and embedded mitigations. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 24 Impact on Commercial Fishing Vessel Activity

13-614. Fishing vessel activity throughout the Study Area is presented **in Section 6.2.2.5 of the NRA** and further information is located in **Volume 2** ,**Chapter**

13-615. **11: Commercial Fisheries**. It is noted in the MDS that the presence of all projects together will have the greatest impact on commercial fishing vessels, as this would generate the greatest number of subsea cables and moorings and, therefore, increase snagging risk.

13-616. It is noted that that the impact on commercial fishing vessels will reduce as decommissioning progresses and the extent of structures within the Array Area and subsurface cables and moorings reduces. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phases of the Proposed Offshore Development.

13-617. As a result, considering the requirement for the FMMCP (EM25), Promulgation of Information (EM22), and the NSVMP (EM17), the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the available sea room and the Cable Plans (EM9 and EM47) that are embedded in the Proposed Offshore Development and expected to be similarly embedded in the surrounding Tier 3/4 Projects. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 25 Impact on Recreational Activity

13-618. Recreational vessel activity throughout the Study Area is presented in **Section 6.2.2.4 of the NRA**. It is noted in the MDS that, with the exception of Salamander and Flora Wind Farm, all the proposed wind farm projects are far enough offshore that they will have very little cumulative impact on recreational vessels. The Spittal – Peterhead HVDC Cable is proposed to overlap the ECC closer to shore and will therefore, alongside Flora and Salamander windfarms, have the greatest potential for impacts on recreational vessels. Despite this, very little information is currently known about the timescale for the proposed Flora Wind Farm, and both of the windfarms are also outside the area of highest recreational vessel density.

13-619. It is further noted that the impact on recreational vessels will reduce as decommissioning progresses and the extent of structures within the Array Area and subsea cables and moorings reduces. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development.

13-620. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Negligible/Minor adverse significance. A **Minor** rather than Negligible effect has been determined given the potential for some impact to recreational vessels in the cumulative scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as ALARP and **Minor,** which is not significant in EIA terms.

Impact 26 Impact on Risk of Allision

13-621. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced around the Project and/or be required to transit between multiple projects due to surrounding windfarms and/or cable removal and decommissioning. Impacts on routeing may in turn lead to increased allision risk. It is noted in the MDS that all the proposed projects could impact the risk of allision as this cumulative scenario would generate the maximum number of structures for vessels to allide with.

13-622. It is noted that the risk of allision will reduce as decommissioning progresses and the extent of structures within the Array Area reduces. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development.

13-623. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that several mitigation measures are embedded in the Proposed Offshore Development to minimise both the likelihood and consequence of an allision in the cumulative scenario (including site marking and charting [EM18], lighting and marking [EM16], safety zones [EM19, and the provision of an ERCoP [EM30]). No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor**, which is not significant in EIA terms.

Impact 27 Impact on Risk of Collision

13-624. As per the cumulative routeing assessment (**Section 0**), some of the existing commercial and passenger ferry traffic in the area would likely be displaced and/or be required to transit between multiple windfarms, due to surrounding windfarms and/or cable removal/decommissioning. Impacts on routeing may in turn lead to increased collision risk.

13-625. It is noted that the risk of collision will reduce as decommissioning progresses and the extent of structures within the Array Area reduces and available sea room increases. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development.

13-626. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (EM17, see the Proposed NSVMP PMP 3) will minimise the impact of project vessels on established routes, and site marking and charting (EM18) and promulgation of information (EM22) will enable advance passage planning around any construction activities and safety zones. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 28 Impact on Risk of Grounding

13-627. Cable and pipeline decommissioning activity may lead to a potential increase in the risk of grounding; however it is noted that the risk of grounding will reduce as decommissioning progresses and the extent of cables and pipelines above the seabed reduces and UKC increases. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development in combination with the cumulative projects.

13-628. Similarly, in the unlikely event of a grounding, while the worst-case scenario could involve loss of small craft, with a single fatality, the most likely outcome is minor injuries and minor adverse publicity.

13-629. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of decomissioning vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any construction activities and safety zones. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 29 Impact of Towage Operations

13-630. There will be significant towage operations required throughout the decommissioning phases of the Proposed Offshore Development in combination with the other nearby projects, as WTGs are taken from the arrays. These operations may require result in vessels being Restricted in Ability to Manoeuvre (RAM). These operations have potential to affect collision on passage The greatest potential for interactions with vessel routeing is if the tow

is on a coastal route following the current traffic routeing or crossing it to reach the Array Area.

13-631. As highlighted within **Section 13.11.1.6**, details on the decommissioning activities for the Proposed Offshore Development are not fully developed, but there is substantial embedded mitigation in place covering interactions between vessels on passage.

13-632. The number and therefore impact of towage operations during decommissioning phases is anticipated to be much the same as during construction and, as a result, the magnitude of impact is considered the same.

13-633. Furthermore, in the event that the cumulative towage operations impact passing vessel traffic, the most likely outcome is the same as anticipated for the project-alone scenario, whereby vessels are RAM and experience minor delays on their route. While a worst-case scenario could involve vessel collision, with a fatality, this is considered very unlikely given the embedded mitigation measures highlighted above.

13-634. As a result, the magnitude of the impact is deemed to be **Medium,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given the NSVMP (see the Proposed NSVMP PMP 3; EM17) will minimise the impact of project vessels on established routes, and promulgation of information [EM22] will enable advance passage planning around any towage operations. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms

Impact 30 Impact on Search and Rescue Capabilities

13-635. As identified in the MDS, all the proposed projects could impact SAR capabilities given that this cumulative scenario would generate the maximum number of vessels and personnel in the Study Area and minimum amount of sea room for them to operate in, and as such there may be an increase in the number of incidents requiring emergency response or impacts to emergency response procedures.

13-636. It is noted that, while the decommissioning phase of the projects will have more project vessels transiting in the area compared to during O&M, and therefore a higher risk of incidents, the greater presence of project vessels will also form an additional resource to respond to any incidents in the area, both in terms of incidents associated with the Proposed Offshore Development (i.e. self-help resources), but also incidents occurring to third party vessels outside of the Proposed Offshore Development site. Moreover, as decommissioning progresses and the extent of structures within the Array Area reduces and available sea room increases, the risk of incidents requiring SAR is reduced. Therefore, given the embedded mitigations and overall low baseline incident rates, it is anticipated that the residual effect will remain similar to the construction and O&M phase of the Proposed Offshore Development.

13-637. As a result, the magnitude of the impact is deemed to be **Negligible,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance. A Minor rather than Negligible effect has been determined given that there is the potential for a reduction in SAR capabilities, albeit a very small reduction. No additional

mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 31 Impact on Communications, Radar and Positioning Systems

13-638. The likely significant effects on communication, radar and positioning systems are outlined in **Section 13.11.1.8**. It is identified in the MDS that all the proposed projects could impact equipment used for navigation, collision avoidance and communications, as well as masking sound signals from vessels or AtoNs. This is because this cumulative scenario would generate the greatest number of WTGs and therefore the largest potential to exacerbate the impacts on marine navigation, communications and positioning systems.

13-639. It is noted that the impact on communications and radar will reduce as decommissioning progresses and the extent of structures within the Array Area reduces. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development.

13-640. As a result, the magnitude of the impact is deemed to be **High,** and the sensitivity of the receptor is considered to be **Negligible**. The effect will, therefore, be of Minor/moderate adverse significance. A **Minor** rather than moderate effect has been determined given that there is expected to be a Negligible increase compared to in the project-alone scenario. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms.

Impact 32 Impact on Under-Keel Clearance

13-641. Cable and pipeline decommissioning activity may lead to a potential increase in the risk of UKC due to increased project vessel movements causing route deviations; however, it is noted that as decommissioning progresses and the extent of cables and pipelines above the seabed reduces, the reduction in UKC decrease. Nevertheless, it is anticipated that the residual effect will remain the same as during the construction and O&M phase of the Proposed Offshore Development in combination with the cumulative projects.

13-642. Furthermore, the outcome in the event of a reduction in UKC, and a vessel snagging on a cable, is also anticipated to be the same as during the project-alone scenario, with the most likely outcome consisting of minor injuries and minor vessel damage, and the worst credible outcome involving a single fatality.

13-643. As a result, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Medium**. The effect will, therefore, be of minor/moderate adverse significance. A **minor** rather than moderate effect has been determined given that promulgation of information (EM22) and site marking and charting (EM18) will enable safe passage planning north and/or east of the proposed pipelines and cables where the depths are shallow and that, while unlikely, should a vessel snag on the cable protection, the ERCoP (embedded within the Proposed Offshore Development, EM30) will provide the actions to be taken during emergency situations that should be able to mitigate the consequence of the incident. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **minor,** which is not significant in EIA terms.

Impact 33 Impact on Access to Ports and Harbours

13-644. There are no cumulative developments that are anticipated to pose a cumulative risk to access to Ports and Harbours in conjunction with the Proposed Offshore Development in the decommissioning phase. The build out of the surrounding proposed windfarm arrays may increase project associated decommissioning vessel traffic transiting to and from local harbours, however each project would be required to manage project traffic on an individual basis with the ports and harbours anticipated to provide support to those projects.

13-645. It should also be noted that all cumulative developments can be expected to abide by their own embedded mitigations in line with industry standards and regulations. These are likely to include: an ERCOP, AtoNs, navigation in compliance with COLREGS and SOLAS, appropriate marking on nautical charts, and compliance with MCA MGN 654 among others.

13-646. The cumulative additional development of cable and pipelines close to the ECC landfall may increase overall project vessel traffic, but it is not anticipated to notably increase overall baseline traffic levels in the area. Moreover, as is the case for the windfarm array scenario, the management of that decommissioning vessel traffic would be managed on an individual project basis and does not pose a significant cumulative risk in conjunction with the Proposed Development.

13-647. As a result, given the traffic volumes serving the Port of Fraserburgh and Peterhead, and the minimal amount of disruption that would likely be experienced in the event that access is impacted, the magnitude of the impact is deemed to be **Low,** and the sensitivity of the receptor is considered to be **Low**. The effect will, therefore, be of **Minor** adverse significance. No additional mitigation above the embedded mitigation measures (**Table 13-15**) has been identified, so the residual effect has been assessed as **Minor,** which is not significant in EIA terms

13.12.4 Proposed Monitoring

13-648. There is no monitoring proposed for cumulative impacts in addition to those listed in **Section 13.11.4.**

13.13 TRANSBOUNDARY EFFECTS

13-649. A transboundary effects assessment is used to identify the potential effects on shipping and navigation from the Proposed Offshore Development on the interests of European Economic Areas (EEA States).

13-650. Given the international nature of shipping and navigation, transboundary impacts are possible. These are assessed in terms of impacts to international commercial shipping routes. Impacts to vessel routeing were assessed within the impact assessment for both the project-alone scenario (**Section 13.11.1.2, 13.11.2.2, and 13.11.3.2**) and the cumulative scenario (**Section 13.12.3**), including impacts to established commercial routes between the UK and other European ports.

13.14 INTER-RELATED EFFECTS

13-651. The impacts and effects identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts as a result of that interaction. The areas of interaction between impacts are presented in **Table 13-19**, along with an

indication as to whether the interaction may give rise to synergistic impacts. This provides a screening tool for which impacts have the potential to interact.

13-652. Inter-related effects have the potential to be either project lifecycle effects, where the interactions between impacts occur across different phases of the Proposed Offshore Development, or, inter-related receptor effects, where there are interactions between impacts on a receptor or group of receptors within a singular project stage.

13-653. Additionally, effects on shipping and navigation also have the potential to have secondary effects on other receptors and these effects are fully considered in the topic-specific chapters. These receptors and effects are:

- Impact on Commercial Fishing Vessel Activity - **Volume 2, Chapter 11: Commercial Fisheries**; Impact on Floating Mooring and Cable Systems and Interactions with Vessels at Risk of Snagging – **Volume 2, Chapter 11: Commercial Fisheries**;
- Impact on Recreational Activity – **Volume 2, Chapter 17: Socioeconomics, Tourism and Recreation;**
- Impact on Communications, Radar and Positioning Systems - **Volume 2, Chapter 15: Military and Civil Aviation** and **Volume 2, Chapter 12: Infrastructure and Other Marine Users;**
- Impact on Access to Ports and Harbours - **Volume 2, Chapter 12: Infrastructure and Other Marine Users; and**
- Impact on Search and Rescue Capabilities - **Volume 2, Chapter 15: Military and Civil Aviation, Volume 2, Chapter 12: Infrastructure and Other Marine Users** and **Volume 2, Chapter 14: Major Accidents and Disasters.**

Table 13-19 Summary of Likely Significant Inter-Related Effects on the Environment for Shipping and Navigation from Proposed Offshore Development Lifecycle Effects or Receptor-Led effects

Description of Impact	Phase[2]			Likely Significant Inter-Related Effects
	C	O	D	
Impact on Floating Mooring and Cable Systems and Interactions with Vessels at Risk of Snagging	✓	✓	✓	As discussed in **Section 13.11.1.1**,the impact of floating mooring and cable systems on vessels at risk of snagging is expected to be greatest during construction, due to cables being partially protected, however there will be some risk during operation, particularly nearshore where burial is not possible, and the water is shallower. These hazards are expected to be localised to where deep draught vessels navigate within proximity to the WTGs or to landfall. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact of floating mooring and cable systems is considered to be not significant, and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on commercial and ferry routes, including rerouteing/deviation of lifeline services	✓	✓	✓	As discussed in **Section 13.11.1.2**,the impact on commercial and ferry routes is expected to be greatest during operation, when the Proposed Offshore Development is fully constructed at its maximum footprint, however there will be some risk during construction and decommissioning, as a result of project vessels and safety zones. Through the NRA process, all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and the stakeholder consultation process identified that regular engagement with NorthLink Ferries through pre-construction and construction will ensure risk and impact to regular running ferry services remains low. Assuming this additional mitigation measure is adopted, it can be concluded that this impact is ALARP, and tolerable, and there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Commercial Fishing Vessel Safety	✓	✓	✓	As discussed in **Section 13.11.1.11**,the impact on commercial fishing vessel safety is expected to be greatest during construction, due to cables being partially protected, however there will be some risk during operation, particularly nearshore where burial is not possible, and the water is shallower, which could cause gear snagging. Displacement of commercial fishing activity due to the presence of the

[2] C = Construction, O = Operation and Maintenance, D = Decommissioning

Description of Impact	Phase[2]			Likely Significant Inter-Related Effects
	C	O	D	
				Proposed Offshore Development and avoidance of other vessels is also possible, but these impacts are assessed in **Volume 2, Chapter 11: Commercial Fisheries of the EIA.** Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on commercial fishing safety is considered to be not significant and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Recreational Vessel Safety	✓	✓	✓	As discussed in **Section 13.11.1.12**,the impact on recreational vessel safety is expected to be greatest during operation, when the export cable is protected near landfall, reducing water depth and potentially increasing the risk of grounding in areas of reduced UKC. Displacement of recreational vessels due to the presence of the Proposed Offshore Development may also occur and increase the risk of collision, but these impacts discussed **in Volume 2, Chapter 17: Socioeconomics, Tourism and Recreation**. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on recreational vessel safety is considered to be not significant and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Risk of Allision	✓	✓	✓	As discussed in **Section13.11.1.3**, the impact on risk of allision is expected to be greatest during operation, when the Proposed Offshore Development is fully constructed at its maximum footprint. The NRA conducted (Volume 3, Appendix 13.1) was of sufficient detail that interactions between effects were considered, both from different phases and different receptors. All identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and the stakeholder consultation process identified that regular engagement with NorthLink Ferries through pre-construction and construction will ensure allision risk for regular running ferry services remains low. Assuming this additional mitigation measure is adopted, it can be concluded that this impact is ALARP, and tolerable, and that there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Risk of Collision	✓	✓	✓	As discussed in **Section 13.11.1.4**, the displacement of vessel activity due to the presence of the Proposed Offshore Development increases the risk of vessel-vessel collision, so the risk of collision is therefore expected to be greatest during operation, when the Proposed Offshore Development is fully

Description of Impact	Phase[2]			Likely Significant Inter-Related Effects
	C	O	D	
				constructed at its maximum footprint. The NRA conducted (Volume 3, Appendix 13.1) was of sufficient detail that interactions between effects were considered, both from different phases and different receptors. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and that no further mitigation was identified, it can be concluded that this impact is ALARP, and tolerable, and that there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Under Keel Clearance Due to Subsurface Infrastructure	✓	✓	✓	As discussed in **Section 13.11.1.9**, subsurface infrastructure due to the Proposed Offshore Development can cause a reduction in Under Keel Clearance which can impact the risk of grounding or snagging so this impact is therefore expected to be greatest during operation, due to cables being partially protected, however there will be some risk during operation, when there is maximum cable protection applied to the export cable near landfall and therefore minimum UKC. However, this hazard is expected to be localised to where deep draught vessels navigate within proximity to the landfall. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on UKC due to subsurface infrastructure is considered to be not significant, and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Search and Rescue capabilities	✓	✓	✓	As discussed in **Section 13.11.2.7**, the need for search and rescue assets to enter the Proposed Offshore Development Array Area has impacts upon marine (lifeboat) and aviation (SAR helicopter) receptors, and these impacts are assessed in this chapter and within **Volume 2, Chapter 15: Military and Civil Aviation**. The NRA conducted (Volume 3, Appendix 13.1) was of sufficient detail that interactions between effects were considered, both from different phases and different receptors, so, considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on SAR capabilities is considered to be not significant, and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Communications,	✓	✓	✓	As discussed in **Section 13.11.1.8** impacts to communication systems and shore-based radar may occur in addition to marine radar, and while the marine impacts are considered in this chapter, the impacts on aviation communication are further assessed within **Volume 2, Chapter 15: Military and Civil Aviation**.

Description of Impact	Phase[2]			Likely Significant Inter-Related Effects
	C	O	D	
Radar and Positioning Systems				This impact is expected to be greatest during operation, when there are the maximum number of structures and devices that could interfere with equipment. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on SAR capabilities is considered to be not significant, and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on Risk of Grounding	✓	✓	✓	As discussed in **Section 13.11.3.5**, displacement of vessel activity near the shore, where water depths are shallower can increase the risk of vessel grounding. This hazard is therefore expected to be localised to where deep draught vessels navigate within proximity to the landfall. Considering that the NRA conducted (Volume 3, Appendix 13.1) was of sufficient detail that interactions between effects were considered, both from different phases and different receptor and that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and no further mitigation was identified, the impact on risk of grounding is considered to be not significant, and it can be concluded there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact of WTG Breakout on Vessel Safety	✓	✓	✓	As discussed in **Section 13.11.1.13**, a WTG could become displaced from its position or break free and become a navigational hazard to other vessels, were its moorings to fail. Therefore, this impact is expected to be greatest during operation, when there is the greatest number of WTGs and moorings at risk of failure. The NRA conducted (Volume 3, Appendix 13.1) was of sufficient detail that interactions between effects were considered, both from different phases and different receptors. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and that no further mitigation was identified, it can be concluded that this impact is ALARP, and tolerable, and that there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact on access to Ports and Harbours	✓	✓	✓	As discussed in **Section 13.11.1.10**, the impact on access to ports and harbours may be affected by the presence of the Proposed Offshore Development and the operations associated with it and is therefore expected to be greatest during construction and decommissioning, when there are more frequent project vessel movements to and from the port(s). Considering that, through the NRA process, all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, no further

Description of Impact	Phase[2]			Likely Significant Inter-Related Effects
	C	O	D	
				mitigation was identified, it can be concluded that this impact is ALARP, and tolerable, and there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact of Towage Operations	✓	✓	✓	As discussed in **Section 13.11.2.6**, towage operations required for the Proposed Offshore Development may impact the risk of vessel collisions and allisions, so this impact is expected to be greatest during construction (and decommissioning), when frequent towage operations will be required to take WTGs to and from the Array Area. However, these movements would be controlled by the NSVMP (EM17) which will prescribe the requirements for Proposed Offshore Development vessel passage planning, securing the management and coordination of vessel activities, as well as communications and reporting requirements. Considering that all identified hazards associated with this impact were agreed with stakeholders during the hazard workshop to be either Low Risk – Broadly Acceptable or Medium Risk – Tolerable if ALARP, and that no further mitigation was identified, it can be concluded that this impact is ALARP, and tolerable, and that there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Impact of Small Movements of Floating Installations around the Nominal Central Location		✓		As discussed in **Section 13.11.2.14**, small movements of the floating installations around a nominal central location can increase the risk of allision events and this impact is therefore expected to be greatest during operation, when the Proposed Offshore Development is fully constructed at its maximum footprint. However, given that the movement of WTGs is unlikely to exceed 100 m dependent on the type of moorings selected, and that WTG movements are considered unlikely to cause an allision given that the weather limitations and associated metocean conditions likely driving the movement are anticipated to affect any nearby vessels in the same way. it can be concluded that this impact is not significant, and that there will be no inter-related effects across construction, operation and maintenance and decommissioning.
Receptor Led Effects				
Potential exists for the presence of the potential buoyed construction and decommissioning areas during the construction and decommissioning phases, respectively, to result in the displacement from fishing grounds of commercial fishing vessels. This displacement and the associated reduction in available sea room will increase the vessel-to-vessel collision risk between third-party vessels. However, there is very limited fishing that takes place with the Array Area, so it is unlikely that effects will act together and that any interactions between effects will be of any greater significance than those already assessed for the Proposed Offshore Development alone.				

13.15 SUMMARY

13-654. The construction, operational and decommissioning phases of the Proposed Offshore Development would cause a range of effects on shipping and navigation. The magnitude, sensitivity and, therefore, the significance (in EIA terms) of these effects has been assessed using expert assessment, drawing from a wide science base that includes Proposed Offshore Development-specific surveys and desk-based numerical modelling activities. A summary of the residual effects of the Proposed Offshore Development on shipping and navigation is listed in **Table 13-20**.

Table 13-20 Summary of the Likely Significant Environmental Effects, Mitigation, Monitoring and Residual Effects for Shipping and Navigation

Description of Impact	Phase			Magnitude of Impact	Sensitivity of Receptor	Embedded Mitigation Measures	Significance of Effect	Secondary Mitigation Measures	Residual Effect	Proposed Monitoring
	C	O	D							
Project Alone Summary										
Impact of Floating Mooring and Cable Systems and Interactions with Vessels at Risk of Snagging	✓	✓	✓	Low	Medium	EM17 – NSVMP EM18 – Site Marking and Charting EM19 – Safety Zones EM22 – Promulgation of Information EM25 – FMMCP EM30 - ERCoP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact on Commercial and Ferry Routes	✓	✓	✓	Low	Low	EM18 – Site Marking and Charting EM20 – AtoN Management Plan EM22 – Promulgation of Information	Minor (Not Significant in EIA Terms)	Regular engagement is made with NorthLink, regarding the IRC Platform location, pre and during construction to ensure that there is sufficient sea room for collision avoidance and adverse weather routeing.	Minor (Not Significant in EIA Terms)	N/A
Impact on Risk of Allision	✓	✓	✓	Low	Medium	EM16 - LMP EM18– Site Marking and Charting EM19 – Safety Zones EM20 - AtoN Management Plan EM21 –Construction Buoyage EM22– Promulgation of Information EM25 – FMMCP EM30 - ERCoP	Minor (Not Significant in EIA Terms)	Regular engagement is made with NorthLink, regarding the IRC Platform location, pre and during construction to ensure that there is sufficient sea room for collision avoidance and adverse weather routeing.	Minor (Not Significant in EIA Terms)	• AtoN monitoring, as detailed within the Proposed AtoN Management Plan (PMP 4).
Impact on Risk of Collision	✓	✓	✓	Low	Medium	EM17 – NSVMP EM18 – Site Marking and Charting	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	• Monitoring of Proposed Offshore Development vessel traffic to be undertaken as per the Proposed NSVMP (PMP 3).
Impact on Risk of Grounding	✓	✓	✓	Low	Medium	EM9 – Cable Plan EM17 - NSVMP EM29 – Periodic Hydrographic Surveys EM47 – Cable Specification and Installation Plan	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	• Periodic Hydrographic Surveys to the International Hydrographic Organisation (IHO) Order 1a standard (that meets MGN 654 requirements), with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UKHO. • Monitoring of the cables and their burial status post-installation, to be set out in the Cable Plan produced post-consent
Impact of Towage Operations	✓	✓	✓	Low	Low	EM17 – NSVMP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact on Search and Rescue Capabilities	✓	✓	✓	Negligible	Low	EM30 – ERCoP EM46 -Design Layout	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A

Description of Impact	Phase			Magnitude of Impact	Sensitivity of Receptor	Embedded Mitigation Measures	Significance of Effect	Secondary Mitigation Measures	Residual Effect	Proposed Monitoring
	C	O	D							
Impact on Communications, Radar and Positioning Systems	✓	✓	✓	Medium	Negligible	EM46 -Design Layout	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact on Under Keel Clearance due to Subsurface Infrastructure	✓	✓	✓	Low	Medium	EM9- Cable Plan EM18 – Site Marking and Charting EM19 – Safety Zones EM30 - ERCoP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	• Periodic Hydrographic Surveys to the International Hydrographic Organisation (IHO) Order 1a standard (that meets MGN 654 requirements), with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UKHO. • Monitoring of the cables and their burial status post-installation, to be set out in the Cable Plan produced post-consent
Impact on Access to Ports and Harbours	✓	✓	✓	Low	Low	EM17 – NSVMP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact on Commercial Fishing Safety	✓	✓	✓	Low	Medium	EM9 – Cable Plan EM17 – NSVMP EM19 – Safety Zones EM22 – Promulgation of Information EM25 – FMMCP EM30 - ERCoP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact on Recreational Vessel Safety	✓	✓	✓	Low	Medium	EM17 – NSVMP EM21 -Construction Buoyage EM22 – Promulgation of Information EM30 - ERCoP	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact of WTG Breakout on Vessel Safety	✓	✓	✓	Negligible	High	EM16 – LMP EM30 – ERCoP EM31 – Compliance with Regulatory expectations on moorings for floating wind and marine devices (HSE/MCA, 2017)	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Impact of Small Movements of Floating Installations around the Nominal Central Location	×	✓	×	High	Negligible	EM16 – LMP EM18 – Site Marking and Charting	Minor (Not Significant in EIA Terms)	N/A	Minor (Not Significant in EIA Terms)	N/A
Description of Impact	**Phase**			**Magnitude of Impact**	**Sensitivity of Receptor**		**Significance of Effect**	**Additional Measures**	**Residual Effect**	**Proposed Monitoring**
	C	**O**	**D**							
Cumulative Effects Summary										
Impact on Commercial and Ferry Routes	✓	✓	✓	High	Negligible	EM18 – Site Marking and Charting EM20 – AtoN Management Plan	Minor	Regular engagement is made with NorthLink, regarding the IRC Platform location, pre and during construction to ensure that there is sufficient sea	Minor	N/A

Description of Impact	Phase			Magnitude of Impact	Sensitivity of Receptor	Embedded Mitigation Measures	Significance of Effect	Secondary Mitigation Measures	Residual Effect	Proposed Monitoring
	C	O	D							
						EM22 – Promulgation of Information		room for collision avoidance and adverse weather routeing.		
Impact on Risk of Allision	✓	✓	✓	Low	Medium	EM16 - LMP EM18– Site Marking and Charting EM19 – Safety Zones EM20 - AtoN Management Plan EM21 –Construction Buoyage EM22– Promulgation of Information EM25 – FMMCP EM30 - ERCoP	Minor	Regular engagement is made with NorthLink, regarding the IRC Platform location, pre and during construction to ensure that there is sufficient sea room for collision avoidance and adverse weather routeing.	Minor	AtoN monitoring, as detailed within the Proposed AtoN Management Plan (PMP 4).
Impact on Risk of Collision	✓	✓	✓	Low	Medium	EM17 – NSVMP EM18 – Site Marking and Charting EM22– Promulgation of Information	Minor	N/A	Minor	Monitoring of Proposed Offshore Development vessel traffic to be undertaken as per the Proposed NSVMP (PMP 3).
Impact on Risk of Grounding	✓	✓	✓	Low	Medium	EM9 – Cable Plan EM17 - NSVMP EM29 – Periodic Hydrographic Surveys EM47 – Cable Specification and Installation Plan	Minor	N/A	Minor	• Periodic Hydrographic Surveys to the International Hydrographic Organisation (IHO) Order 1a standard (that meets MGN 654 requirements), with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UKHO. • Monitoring of the cables and their burial status post-installation, to be set out in the Cable Plan produced post-consent
Impact of Towage Operations	✓	✓	✓	Medium	Low	EM17 – NSVMP	Minor	N/A	Minor	N/A
Impact on Search and Rescue Capabilities	✓	✓	✓	Negligible	Low	EM30 – ERCoP EM46 -Design Layout	Minor	N/A	Minor	N/A
Impact on Communications, Radar and Positioning Systems	✓	✓	✓	High	Negligible	EM46 -Design Layout	Minor	N/A	Minor	N/A
Impact on Under Keel Clearance due to Subsurface Infrastructure	✓	✓	✓	Low	Medium	EM9- Cable Plan EM18 – Site Marking and Charting EM19 – Safety Zones EM30 - ERCoP	Minor	N/A	Minor	• Periodic Hydrographic Surveys to the International Hydrographic Organisation (IHO) Order 1a standard (that meets MGN 654 requirements), with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager and the UKHOMonitoring of the cables and their burial status post-installation, to be set out in the Cable Plan produced post-consent
Impact on Access to Ports and Harbours	✓	✓	✓	Low	Low	EM17 – NSVMP	Minor	N/A	Minor	N/A

Description of Impact	Phase			Magnitude of Impact	Sensitivity of Receptor	Embedded Mitigation Measures	Significance of Effect	Secondary Mitigation Measures	Residual Effect	Proposed Monitoring
	C	O	D							
Impact on Commercial Fishing Vessel Activity	✓	✓	✓	Medium	Low	EM9 – Cable Plan EM17 – NSVMP EM19 – Safety Zones EM22 – Promulgation of Information EM25 – FMMCP EM30 - ERCoP	Minor	N/A	Minor	N/A
Impact on Recreational Activity	✓	✓	✓	Low	Negligible	EM17 – NSVMP EM21 -Construction Buoyage EM22 – Promulgation of Information EM30 - ERCoP	Minor	N/A	Minor	N/A

13.16 REFERENCES

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