Salamander Offshore Wind Farm

Offshore EIA Report

Volume ER.A.3, Chapter 14: Shipping and Navigation

SALAMANDER

Powered by Ørsted and
Simply Blue Group

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Glossary

Term	Definition
ALARP	Reduction of residual risk, post assessment, as far as reasonably practicable with consideration for people, environment, business and property. For a risk to be ALARP, it must be possible to demonstrate that the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained.
Allision	The act of striking or collision of a moving vessel against a stationary object.
Applicant	Salamander Wind Project Company Limited (formerly called Simply Blue Energy (Scotland) Limited), a joint venture between Ørsted, Simply Blue Group, and Subsea7
Automatic Identification System (AIS)	A system by which vessels automatically broadcast their identity, key statistics including location, destination, length, speed and current status, e.g. under power. Most commercial vessels and United Kingdom (UK)/European Union (EU) fishing vessels over 15 metre (m) length are required to carry AIS.
Collision	The act or process of colliding (crashing) between two moving objects.
Cumulative Effects	The combined effect of the Salamander Project with the effects from a number of different projects, on the same single receptor/resource.
Cumulative Impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Salamander Project.
Design Envelope	A description of the range of possible elements that make up the Salamander Project design options under consideration, as set out in detail in the project description. This envelope is used to define the Salamander Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known.
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the importance, or sensitivity, of the receptor or resource in accordance with defined significance criteria.
EIA Regulations	The regulations that apply to this project are the Electricity Works (EIA) (Scotland) Regulations 2017, the Marine Works (EIA) (Scotland) Regulations 2017, the Marine Works (EIA) Regulations 2007, and the Town and Country Planning (EIA) (Scotland) Regulations 2017.
Environmental Impact Assessment (EIA)	A statutory process by which the likely significant effects of certain projects must be assessed before a formal decision to proceed can be made. It involves the

Term	Definition
	collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Impact Assessment Report (EIAR).
Formal Safety Assessment (FSA)	A structured and systematic process for assessing the risks and costs (if applicable) associated with shipping activity.
Impact	An impact is considered to be the change to the baseline as a result of an activity or event related to the Salamander Project. Impacts can be both adverse or beneficial impacts on the environment and be either temporary or permanent.
Inter-array Cables	Offshore cables which link the wind turbines to each other and to the Offshore Export Cable(s).
Inter-Related Effect (or Inter Relationships)	The likely effects of multiple impacts from the proposed development on one receptor. For example, noise and air quality together could have a greater effect on a residential receptor than each impact considered separately.
Landfall	The generic term applied to the entire landfall corridor between Mean Low Water Spring (MLWS) tide and the Transition Joint Bay (TJB) inclusive of all construction works, including the offshore and onshore Export Cable Corridor, and landfall compound, where the offshore cables come ashore north of Peterhead.
Marine Guidance Note (MGN)	A system of guidance notes issued by the Maritime and Coastguard Agency (MCA) which provide significant advice relating to the improvement of the safety of shipping at sea, and to prevent or minimise pollution from shipping.
Navigational Risk Assessment (NRA)	A document which assesses the hazards to Shipping and Navigation of a proposed Offshore Renewable Energy Installation (OREI) based upon FSA.
Offshore Array Area (OAA)	The offshore area within which the wind turbine generators, foundations, mooring lines and anchors, and inter-array cables and associated infrastructure will be located.
Offshore Development	The entire Offshore Development, including all offshore components of the Salamander Project (WTGs, Inter-array and Offshore Export Cable(s), floating substructures, mooring lines and anchors, and all other associated offshore infrastructure) required across all Salamander Project phases from development to decommissioning, for which the Applicant is seeking consent.
Offshore Development Area	The total area comprising the Offshore Array Area and the Offshore Export Cable Corridor.

Term	Definition
Offshore Export Cable Corridor	The area that will contain the Offshore Export Cable(s) between the boundary of the Offshore Array Area and Mean High Water Springs (MHWS).
Offshore Export Cable(s)	The export cable(s) that will bring electricity from the Offshore Array Area to the Landfall. The cable(s) will include fibre optic cable(s).
Receptor (Offshore)	Any physical, biological or anthropogenic element of the environment that may be affected or impacted by the Salamander Project. Receptors can include natural features such as the seabed and wildlife habitats as well as man-made features like fishing vessels and cultural heritage sites.
Safety Zone	A marine area declared for the purposes of safety around a renewable energy installation or works/ construction area under the Energy Act 2004.
Salamander Project	The proposed Salamander Offshore Wind Farm. The term covers all elements of both the offshore and onshore aspects of the project
Scoping	An early part of the EIA process by which the key potential significant impacts of the Salamander Project are identified, and methodologies identified for how these should be assessed. This process gives the relevant authorities and key consultees opportunity to comment and define the scope and level of detail to be provided as part of the EIAR – which can also then be tailored through the consultation process.
Semi-Submersible	A Semi-Submersible structure is a buoyancy-stabilised platform which floats partially submerged on the surface of the ocean whilst anchored to the seabed. The structure gains its stability through the distribution of buoyancy force associated with its large footprint and geometry which ensures the wind loading on the structure and turbine are countered by an equivalent buoyancy force on the opposite side of the structure. Included in the Project Design Envelope, there are variations of the semi-submersible concept, such as barge, buoy, or hybrid.
Wind Turbine Generator	All the components of a wind turbine, including the tower, nacelle, and rotor.

Acronyms

Term	Definition
AIS	Automatic Identification System

Term	Definition
ALARP	As Low As Reasonably Practicable
ALB	All-Weather Lifeboat
CBRA	Cable Burial Risk Assessment
CEA	Cumulative Effects Assessment
COLREGs	Convention on the International Regulations for Preventing Collisions at Sea
CoS	Chamber of Shipping
DfT	Department for Transport
ECC	Export Cable Corridor
EEA	European Economic Area
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic Field
ERCoP	Emergency Response Cooperation Plan
EU	European Union
FSA	Formal Safety Assessment
GPS	Global Positioning System
HVAC	High Voltage Alternating Current
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IMO	International Maritime Organization
INTOG	Innovation and Targeted Oil and Gas
ITF	International Transport Forum
JIP	Joint Industry Partner
JV	Joint Venture

Term	Definition
km	Kilometres
m	Metre
MAIB	Maritime Accident Investigation Branch
MCA	Maritime and Coastguard agency
MGN	Marine Guidance Note
MHWS	Mean High Water Springs
MPCP	Marine Pollution Contingency Plan
MD-LOT	Marine Directorate - Licensing Operations Team
MW	Megawatts
NLB	Northern Lighthouse Board
nm	Nautical Mile
NRA	Navigational Risk Assessment
NUC	Not Under Command
O&M	Operation & Maintenance
OAA	Offshore Array Area
OECD	Organisation for Economic Cooperation and Development
OREI	Offshore Renewable Energy Installations
OWF	Offshore Wind Farm
PLL	Potential Loss of Life
Radar	Radio Detection and Ranging
RAM	Restricted in Ability to Manoeuvre
RNLI	Royal National Lifeboat Institution
RYA	Royal Yachting Association

Term	Definition
SAR	Search and Rescue
SWPC	Salamander Wind Project Company Ltd. (formerly called SBES)
SOLAS	International Convention for the Safety of Life at Sea
SPFA	Scottish Pelagic Fishermen's Association
SWFPA	Scottish White Fish Producers Association
TPV	Third Party Verification
UK	United Kingdom
UKHO	United Kingdom Hydrographic Office
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
VMP	Vessel Management Plan
WTG	Wind Turbine Generator

14 Shipping and Navigation

14.1 Introduction

14.1.1.1 The Applicant, Salamander Wind Project Company Ltd. (SWPC), a Joint Venture (JV) partnership between Ørsted, Simply Blue Group and Subsea7, is proposing the development of the Salamander Offshore Wind Farm (hereafter 'Salamander Project'). The Salamander Project will consist of the installation of a floating offshore wind farm (up to 100 megawatts (MW) capacity) approximately 35 kilometres (km) east of Peterhead. It will consist of both offshore and onshore infrastructure, including an offshore generating station (wind farm), export cables to landfall, and connection to the electricity transmission network (please see **Volume ER.A.2, Chapter 4: Project Description** for full details on the Salamander Project Design).

14.1.1.2 This chapter of the Offshore Environmental Impact Assessment (EIA) Report (EIAR) presents the results of the EIA of potential effects of the Salamander Project on Shipping and Navigation. Specifically, this chapter considers the potential impact of the Salamander Project seaward of Mean High Water Springs (MHWS) during the construction, operation and maintenance, and decommissioning phases of the Offshore Development.

14.1.1.3 The chapter provides an overview of the existing environment for the proposed Offshore Development Area, followed by an assessment of significance of effect on Shipping and Navigation receptors, as well as an assessment of potential cumulative effects with other relevant projects and effects arising from interactions on receptors across topics.

14.1.1.4 This chapter should be read alongside and in consideration of the following:

- **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment (NRA)**, which provides the primary technical assessment to inform this chapter. The NRA has been produced in line with the relevant Maritime and Coastguard Agency (MCA) requirements as per Marine Guidance Note (MGN) 654 (MCA, 2021).
- **Volume ER.A.3, Chapter 13: Commercial Fisheries**, which assesses impacts associated with fishing gear (this chapter and **Volume A.4, Annex 14.1 NRA** focus on vessels in transit).

14.1.1.5 This chapter has been authored by Anatec Ltd. Further competency details of the authors of this chapter are outlined in **Volume ER.A.4, Annex 1.1: Details of Project Team.**

14.2 Purpose

14.2.1.1 The primary purpose of this EIAR is for the application for the Salamander Project satisfying the requirements of Section 36 of the Electricity Act 1989 and associated Marine Licences. This EIAR chapter describes the potential environmental impacts from the Offshore Development and assesses the significance of their effect.

14.2.1.2 The EIAR has been finalised following the completion of the pre-application consultation (**Volume RP.A.4, Report 1: Pre-Application Consultation (PAC) Report**) and the Salamander EIA Scoping Report (Simply Blue Energy (Scotland) Ltd. (SBES), 2023) and takes account of the relevant advice set out within the Scoping Opinion from Marine Directorate – Licensing Operations Team (MD-LOT) (MD-LOT, 2023) relevant to the Offshore Development. Comments relating to the Energy Balancing Infrastructure (EBI) will be addressed within the Onshore EIAR. The Offshore EIAR will accompany the application to MD-LOT for Section 36

Consent under the Electricity Act 1989, and Marine Licences under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009.

14.2.1.3 This EIAR chapter:

- Outlines the existing environmental baseline determined from assessment of publicly available data, project-specific survey data and stakeholder consultation;
- Presents the potential environmental impacts and resulting effects arising from the Salamander Project on Shipping and Navigation receptors;
- Identifies mitigation measures designed to prevent, reduce, or offset adverse effects and enhance beneficial effects on the environment; and
- Identifies any uncertainties or limitations in the methods used and conclusions drawn from the compiled environmental information.

14.3 Planning and Policy Context

14.3.1.1 The preparation of the Shipping and Navigation Chapter has been informed by the following policy, legislation, and guidance outlined in **Table 14-1**.

Table 14-1 Relevant policy, legislation and guidance relevant to the Shipping and Navigation assessment

Relevant policy, legislation, and guidance
Policy
United Kingdom (UK) Marine Policy Statement (His Majesty's Government, 2011)
Scotland's National Marine Plan (Scottish Government, 2015)
Scotland's Sectoral Marine Plan for Offshore Wind Energy (Scottish Government, 2020)
Legislation
Marine and Coastal Access Act 2009
United Nations Convention on the Law of the Sea (UNCLOS)
Convention on the International Regulations for Preventing Collisions at Sea (COLREGS) (International Maritime Organization (IMO), 1972/77)
International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974)
Guidance
MGN 654 (Merchant and Fishing) Safety of Navigation: Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response (MCA, 2021) and its annexes.

Relevant policy, legislation, and guidance
Revised Guidelines for Formal Safety Assessment (FSA) for Use in the Rule-Making Process (International Maritime Organization (IMO), 2018).
MGN 372 Amendment 1 (M+F) Guidance to mariners operating in vicinity of UK OREIs (MCA, 2022).
International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Recommendations O-139 for and Guidance (G1162) of the Marking of Man-Made Offshore Structures (IALA, 2021).
The Royal Yachting Association's (RYA) Position on Offshore Renewable Energy Developments: Paper 1 (of 4) – Wind Energy (RYA, 2019).

14.3.1.2 Further details on requirements for EIA are presented in **Volume ER.A.2, Chapter 2: Legislative Context and Regulatory Requirements**.

14.4 Consultation

14.4.1.1 Consultation is a key part of the application process. It has played an important part in ensuring that the baseline characterisation and impact assessment is appropriate to the scale of development as well as meeting the requirements of the regulators and their advisors. For Shipping and Navigation, the consultation process has considered the requirements of MGN 654 (MCA, 2021).

14.4.1.2 An overview of the Salamander Project consultation process is outlined in **Volume ER.A.2, Chapter 5: Stakeholder Consultation**. Consultation regarding Shipping and Navigation has been conducted through direct meetings with key stakeholders, an outreach to regular vessel operators of the area, and a hazard workshop.

14.4.1.3 The issues raised during consultation specific to Shipping and Navigation are outlined in **Table 14-2**, including consideration of where the issues have been addressed within this EIAR.

Table 14-2 Consultation responses specific to the Shipping and Navigation topic

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
UK Chamber of Shipping	21 June 2023; comments on EIA Scoping Report	Do you agree that all relevant legislation, policy and guidance documents have been identified for the shipping and navigation assessment, or are there any additional legislation, policy and guidance documents that should be considered? "The list of documentation looks broadly as expected to assess the shipping and navigation impact, however should also include Scotland's National Marine Plan and its policies and Scotland's Sectoral Marine Plan for Offshore Wind Energy and its policies."	This has been addressed within **Section 14.3**.
		Do you agree with the Study Area defined for shipping and navigation? "Yes the 10nm Study Area is an accepted standard. The Chamber recommends a wider routeing Study Area of 50nm, which may be included as part of the wider cumulative impact assessment to consider routeing impacts of the proposed development in combination with other developments."	Cumulative assessment methodology is presented in **Section 3.3, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**, with cumulative tiering considering a radius of up to 50 nm from the Offshore Array Area (OAA). Cumulative impact assessment has then been undertaken in this Chapter in **Section 14.13**.
		Do you agree with the data and information sources identified to inform the baseline for shipping and navigation including the planned vessel traffic surveys, or are there any additional data and information sources that should be considered? "AIS data from 2021 will not be representative of a typical year due to Covid-19 in particular for passenger/cruise traffic. Accordingly, the Chamber strongly recommends that additional AIS data for 2022 is procured especially for the summer period. This is widely available and allows for greater seasonal analysis."	The Navigational Risk Assessment (NRA) has considered 28 days of MGN 654 compliant seasonal vessel traffic survey data from 2023 in **Section 10, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**. A summary of the data is provided in this Chapter in **Section 14.7.1**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
		Do you agree with the suggested embedded mitigation measures? "The Chamber would expect to see inclusion of all the embedded mitigation measures as a minimum."	The embedded mitigation measures assumed are presented in **Section 14.8.3.**
		Do you agree that all potential receptors and impacts have been identified for shipping and navigation? "The list is as the Chamber would expect at this stage."	The risk assessment is provided in **Section 14.11** and in **Section 16, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment,** which includes the shipping and navigation users and hazards detailed at scoping stage.
		Do you agree that the impacts proposed can be scoped out of the shipping and navigation EIA chapter? "The Chamber agrees that no potential impacts should be scoped out."	The risk assessment is provided in **Section 14.11** and in **Section 16, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment,** which includes the shipping and navigation users and hazards detailed at scoping stage.
		Do you agree with the approach for cumulative effects assessment and transboundary impacts? "The Chamber agrees that cumulative and transboundary impacts need to be considered and is satisfied with a 50nm Study Area. The Chamber does not consider that the impacts relating to vessel displacement and reduction in port access should be assessed for the Salamander Project at the "in isolation" level only but also cumulatively with other projects in the area which impact upon the service."	Cumulative assessment methodology is presented in **Section 3.3, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment,** with cumulative tiering considering a radius of up to 50 nm from the OAA. Cumulative impact assessment has then been undertaken in this Chapter in **Section 14.13**.
		Do you agree with the proposed assessment approach and list of planned consultees? "Yes"	Noted.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Royal Yachting Association (RYA) Scotland	21 June 2023; comments on EIA Scoping Report	"RYA Scotland agreed to a range of relevant parts in the scoping report and provided some suggestions."	All commented from the RYA have been noted and addressed within **Volume ER.A.3, Chapter 14: Shipping and Navigation,** where relevant.
		Do you agree that all relevant legislation, policy and guidance documents have been identified for the shipping and navigation assessment, or are there any additional legislation, policy and guidance documents that should be considered? "Yes."	NRA approach is as per the Salamander EIA Scoping Report (SBES, 2023) (see **Section 3, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**). A summary of relevant legislation, policy and guidance is provided in **Section 14.3**.
		Do you agree with the Study Area defined for shipping and navigation? "Yes."	Study Area is as per proposed in Salamander EIA Scoping Report (SBES, 2023) (see **Section 14.5** and **Section 3.4**, **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**).
		Do you agree with the data and information sources identified to inform the baseline for shipping and navigation including the planned vessel traffic surveys, or are there any additional data and information sources that should be considered? "The data to be used for recreational craft are adequate. The requirements for MGN 654 will have to be met but no additional data are needed even though only a proportion of recreational vessels transmit an AIS signal and recreational vessels can be difficult to spot on radar. It should be assumed that a small number of vessels will pass through the site each year. Clearly Shipping and Navigation should be scoped into the EIA. RYA Scotland would like to contribute to the Navigational Risk Assessment."	Data sources are as per Salamander EIA Scoping Report (SBES, 2023) (see **Section 14.6** and **Section 5, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**).
		Do you agree with the suggested embedded mitigation measures?	Promulgation of information strategy has been informed by the NRA process (including RYA Scotland consultation) and

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Royal Yachting Association (RYA) Scotland	21 June 2023; comments on EIA Scoping Report	"Yes. In addition to Kingfisher Bulletins, information should also be disseminated to harbours and marinas through Notices to Mariners.	will include issue of Notices to Mariners (see **Section 14.8.3**). This will be set out in detail in the Vessel Management Plan (VMP) post consent.
		"RYA Scotland would oppose the creation of unnecessary operational safety zones"	The Salamander Project will determine safety zones to be applied for post consent in consultation with key stakeholders including RYA Scotland (see **Section 14.8.3.**). The safety zone application will include procedures by which the safety zones will be monitored and policed.
		Do you agree with the approach for cumulative effects assessment and transboundary impacts? "Since the level of stakeholder concern is one of the criteria for assessing whether a marine activity should be included in the cumulative effects assessment it is a little surprising that a list of candidate projects has not been included."	Cumulative assessment methodology is presented in **Section 3.3, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** with cumulative tiering considering a radius of up to 50 nm from the OAA. Cumulative impact assessment has then been undertaken in this Chapter in **Section 14.13**.
		Do you agree with the proposed assessment approach and list of planned consultees "RYA should be RYA Scotland."	RYA Scotland has been referred to as such throughout the EIAR.
		Do you agree that all potential receptors and impacts have been identified for shipping and navigation? "An additional risk is the failure of Aids to Navigation marking the devices. There have been several cases where lights or AIS transmissions have failed on wind farms off the coast of Scotland in recent months and it has taken several days to	The Salamander Project will comply with the relevant IALA requirements including with regards to aid to navigation availability. Monitoring, maintenance, and repair procedures will be put in place to ensure these targets are met.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Royal Yachting Association (RYA) Scotland	21 June 2023; comments on EIA Scoping Report	replace them due to adverse weather. Mitigation might include the use of virtual AtNs."	The Northern Lighthouse Board (NLB) has been consulted during the NRA process, and lighting and marking will be agreed with NLB post consent.
Maritime and Coastguard Agency (MCA)	21 June 2023; comments on EIA Scoping Report	"The development area carries a moderate amount of traffic with several important commercial shipping routes to/from UK ports and the North Sea. Attention needs to be paid to routeing, particularly in heavy weather so that vessels can continue to make safe passage without large-scale deviations. The likely cumulative and in combination effects on shipping routes should be considered for this project. It should consider the proximity to other windfarm developments, other infrastructure, and the impact on safe navigable sea room. On the understanding that the Shipping and Navigation aspects are undertaken in accordance with MGN 654 and its annexes, along with a completed MGN checklist, MCA is likely to be content with the approach."	Base case vessel routeing has been defined in **Section 11, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** and adverse weather routeing has been assessed in **Section 11.3**, **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**. Cumulative impacts have also been considered in **Section 13, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**. Associated impact assessment is provided in **Section 14.11.**
		"A Navigational Risk Assessment will need to be submitted in accordance with MGN 654.This NRA should be accompanied by a detailed MGN 654 Checklist which can be found at https://www.gov.uk/guidance/offshore-renewable-energy-installations-impact-on-shipping Submit Navigational Risk Assessment in accordance to MGN 654"	The NRA will be included in the application, with MGN 654 compliance demonstrated with a checklist in **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**.
		"We understand from the information presented in table 9-4 and section 9.2.5.2 that the preliminary assessment of 28 days (1st-14th July 2021 and 18th – 31st December 2021) of Automatic Identification System (AIS) data, is presented in figure 9-8. We would like to remind the applicant that a vessel traffic survey must be undertaken to the standard of MGN 654 – at least 28 days which is to include seasonal data (two x 14-day surveys) collected from a vessel-based survey using	Vessel traffic data are fully compliant with MGN 654 have been gathered (comprising 14 days in February 2023 and 14 days in August 2023) and have been assessed in **Section 10, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**. A summary is provided in **Section 14.7.1.**

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Maritime and Coastguard Agency (MCA)	21 June 2023; comments on EIA Scoping Report	AIS, radar and visual observations to capture all vessels navigating in the Study Area. This data shall be updated once the project-specific summer/winter vessel traffic survey has been completed."	
		"The Development Specification and Layout Plan referred to in Section 9.3.6 table 9-9 and table 13-1 in Annex 2 will require MCA approval prior to construction to minimise the risks to surface vessels, including rescue boats, and Search and Rescue aircraft operating within the site. Any additional navigation safety and/or Search and Rescue requirements, as per MGN 654 Annex 5, will be agreed at the approval stage."	As per **Section 14.8.3** there will be MGN 654 compliance including in relation to layout design and the Search and Rescue (SAR) checklist process.
		"We note in section 9.2.8, that Cumulative Effects Assessment will be carried out. As highlighted in this section, the proximity to other projects and activities will need to be fully considered, with an appropriate assessment of the distances between OREI boundaries and shipping routes as per MGN 654. Attention must be paid to the traffic for ensuring the established shipping routes within the North Sea and particularly to / from Peterhead can continue safely without unacceptable deviations."	Vessel routeing has been assessed in **Section 11**, **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** which includes consideration of traffic to/from Peterhead. Cumulative impacts have been assessed in **Section 13 Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** and **Section 14.13.**
		"Attention should be paid to cabling routes and where appropriate burial depth for which a Burial Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary. If cable protection measures are required e.g., rock bags or concrete mattresses, the MCA would be willing to accept a 5% reduction in surrounding depths referenced to Chart Datum. This will be particularly relevant where depths are decreasing towards shore and potential impacts on navigable water increase, such as at the HDD location.	As per **Section 14.8.3** there will be full MGN 654 (MCA, 2021) compliance including in relation to anchor studies and water depth reductions. A Cable Burial Risk Assessment will be undertaken post consent.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Maritime and Coastguard Agency (MCA)	21 June 2023; comments on EIA Scoping Report	Protection Index study should be completed and subject to the traffic volumes, an anchor penetration study may be necessary."	
		"Particular consideration will need to be given to the implications of the site size and location on SAR resources and Emergency Response Co-operation Plans (ERCoP). The report must recognise the level of radar surveillance, AIS and shore-based VHF radio coverage and give due consideration for appropriate mitigation such as radar, AIS receivers and in-field, Marine Band VHF radio communications aerial(s) (VHF voice with Digital Selective Calling (DSC)). A SAR checklist will also need to be completed in consultation with MCA, as per MGN 654 Annex 5 SAR requirements."	Any SAR mitigations required will be agreed with the MCA as part of the SAR checklist process post consent (as required under MGN 654) – see **Section 14.8.3.**
		"MGN 654 Annex 4 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. Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose."	All hydrographic survey requirements will be adhered to as required under MGN 654.
		"It is noted in section 4.3 that HVAC transmission infrastructure maybe installed. We would like to remind the applicant that in the case of any HVDC installation, consideration must be given to the effect of electromagnetic deviation on ships' compasses. The MCA would be willing to accept a three-degree deviation for 95% of the cable route. For the remaining 5% of the cable route no more than five degrees will be attained. If an HVDC cable is being used, we would expect the applicant to do a desk based compass deviation study based on the specifications of the cable lay proposed and assess the effect of EMF on ship's compasses. MCA may request for a deviation survey post the cable being laid; this will confirm conformity with the consent condition. The developer should then provide this	High Voltage Direct Current (HVDC) cables will not be used. High Voltage Alternating Current (HVAC) cables will be used and their Electromagnetic Field (EMF) effects have been considered in **Section 12.6.1 Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Maritime and Coastguard Agency (MCA)	21 June 2023; comments on EIA Scoping Report	data to UKHO via a hydrographic note (H102), as they may want a precautionary notation on the appropriate Admiralty Charts (actions at a later stage depending upon the desk-based study and post installation deviation survey)."	
		"Section 9.3.11, Scoping Questions to Consultees: • Do you agree that all relevant legislation, policy and guidance documents have been identified for the shipping and navigation assessment, or are there any additional legislation, policy and guidance documents that should be considered? - Compliance with Regulatory Expectations on Moorings for Floating Wind and Marine Devices (HSE and MCA, 2017). This guidance should be followed, and a Third-Party Verification of mooring arrangements will be required. • Do you agree with the Study Area defined for shipping and navigation? - Yes. • Do you agree with the data and information sources identified to inform the baseline for shipping and navigation including the planned vessel traffic surveys, or are there any additional data and information sources that should be considered? - Yes. Vessel traffic survey must be undertaken to the standard of MGN 654. • Do you agree with the suggested embedded mitigation measures? - Yes. • Do you agree that all potential receptors and impacts have been identified for shipping and navigation? - Yes.	The relevant guidance has been followed and outlined in **Section 14.3** and **Section 2, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** and approach is as per the Salamander EIA Scoping Report (SBES, 2023).

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Maritime and Coastguard Agency (MCA)	21 June 2023; comments on EIA Scoping Report	• Do you agree that the impacts proposed can be scoped out of the shipping and navigation EIA chapter? - We would expect that all the identified potential impacts identified in chapter 9.2, in particular table 9-6, should be scoped in. • Do you agree with the approach for cumulative effects assessment and transboundary impacts? - Yes. • Do you agree with the proposed assessment approach and list of planned consultees? - Yes."	
		"On the understanding that the Shipping and Navigation aspects are undertaken in accordance with MGN 654 and its annexes, along with a completed MGN checklist, MCA is likely to be content with the approach."	The NRA has been undertaken in alignment with MGN 654 and a completed MGN checklist is presented in **Appendix A, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
NatureScot	21 June 2023; comments on EIA Scoping Report	Section 4.6.2 (Floating Substructures) refers to the potential for wet storage of the substructures prior to their installation within the array area, either at the initial assembly site, the wind turbine integration site or a separate dedicated storage location. Section 4.7.1 (Floating Assembly) also indicates that once operational the substructures and WTGs will form an integrated assembly piece – the replacement of any major component parts of which is expected to be achieved by towing the assembly to port. Wet storage could represent a significant impact. Consideration of the potential impacts on all receptors needs to be addressed with the EIAR and HRA. We would welcome further discussion on this as and when further details are confirmed, noting the intention to seek a separate Marine Licence application for any requirements for wet storage out with the array area.	Wet storage of the floating substructures (and integrated WTGs) prior to tow-out to the OAA is considered to be outside the scope of this EIA and the Marine Licence applications for the Offshore Development. This is due to the fact that at this stage of the Salamander Project it is not known which port(s) will be used for wet storage and therefore it is challenging to undertake a meaningful assessment of impacts related to wet storage. The intent is that the Salamander Project will utilise the services of a port(s) that offer wet storage sites, which will have appropriate consents (obtained by the port authority) for wet storage of floating substructures, fabrication and assembly with the WTGs. To enable the availability of this option for the Salamander Project within the required timeframe, SWPC is an official member of the TS-FLOW UK-North Joint Industry Project (JIP) exploring the challenges of wet storage and identifying the opportunities and potentially suitable locations for these activities. This JIP is in collaboration with relevant ports and other floating offshore wind developers. Separate Marine Licences and associated impact assessments for wet storage areas out with the Offshore Development Area will be applied for and undertaken as appropriate.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Green Volt Offshore Wind Farm	21 June 2023; comments on EIA Scoping Report	"Based on these potential interactions with Green Volt, we would anticipate that the offshore EIA for the proposed Salamander Offshore Wind Farm would consider the following impacts on the offshore elements of the Green Volt Offshore Windfarm project, including: • Windfarm site; • Offshore export corridor between the offshore substation to the landfall, particular the St Fergus South (north of Peterhead) primary option, • Increased vessel traffic and from the physical presence of Salamander infrastructure that may lead to interactions with activities related to Green Volt."	Green Volt has been considered in **Section 13, Section 14.5** and **Section 17 Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**.
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	"With regard to the legislation and guidance listed in Section 9.2.2 within the Scoping Report, the Scottish Ministers highlight the CoS [*Chamber of Shipping*] representation which states that the policies within Scotland's National Marine Plan and Scotland's Sectoral Marine Plan for Offshore Wind Energy should be considered."	This has been addressed within **Section 14.3**.
		"In line with the MCA representation, the Scottish Ministers highlight the requirement that Automatic Identification System ("AIS") data meets the MGN 654 standards. The Scottish Ministers also highlight the advice from the CoS that an additional full 12 months of AIS data should be included in the EIA Report.	The vessel traffic data assessed in **Section 10, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** is compliant with MGN 654. A summary is provided in **Section 14.7.1.**

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	The Scottish Ministers advise that the Developer must engage further with the MCA and CoS to reach a suitable agreement on the provision of AIS data and document the rationale for the final approach within the EIA Report."	This data has been supplemented with consultation and additional data sources such as long-term incident data, a year of Vessel Monitoring System (VMS) data and Anatec's ShipRoutes database.
		"In relation to the proposed Study Area, the Scottish Ministers are broadly content, however draw the Developers attention to the CoS recommendation of a wider routeing Study Area of 50 nautical miles, which may be included as part of the wider cumulative impact assessment to consider routeing impacts of the Proposed Development in combination with other developments."	Cumulative assessment methodology is presented in **Section 3.3 Volume ER.A.4, Annex 14.1 Navigation Risk Assessment**., with cumulative tiering considering a radius of up to 50 nm from the OAA. Cumulative risk assessment is undertaken in **Section 13 Volume ER.A.4, Annex 14.1 Navigation Risk Assessment** and in **Section 14.13**.
		"The Scottish Ministers broadly agree with the impacts to shipping and navigation to be scoped in and out as detailed in Table 9-6. The Scottish Ministers advise that the Developer must give consideration within the EIA Report for the potential effect of electromagnetic deviation on ships' compasses should High-Voltage Direct Current transmission infrastructure be installed. The Scottish Ministers highlight the advice from the MCA that a three-degree deviation for 95% of the cable route would be acceptable, and that for the remaining 5% of the cable route, no more than five degrees will be attained."	HVAC cables will be used and their EMF effects have been considered in **Section 12.6.1 Volume ER.A.4, Annex 14.1 Navigation Risk Assessment.**
		"With regard to cabling routes and cable burial, the Scottish Ministers confirm that a Burial Protection Index should be completed, and, subject to traffic volumes, an anchor penetration study may also be necessary. The Scottish Ministers advise that this should be fully addressed in the EIA Report and highlight the MCA advice on a maximum 5% reduction in surrounding depth referenced to Chart Datum if cable protection measures are required and where depths are decreasing towards the shore."	As per **Section 14.8.3** there will be full MGN 654 (MCA, 2021) compliance including in relation to anchor studies and water depth reductions. A Cable Burial Risk Assessment will be undertaken post consent.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	"The Scottish Ministers also highlight the MCA representation regarding SAR resources, Emergency Response Co-operation Plans, levels of radar surveillance, AIS, and shore-based VHF radio coverage. The Scottish Minsters advise that the MCA representation must be fully addressed in the EIA Report and that a SAR checklist must be completed by the Developers in consultation with the MCA."	Any SAR mitigations required will be agreed with the MCA as part of the SAR checklist process post consent (as required under MGN 654) – see **Section 14.8.3.**
		"In relation to the proposed embedded mitigation measures, the Scottish Ministers highlight the representations from the CoS and RYA Scotland which must be fully addressed by the developer. In addition, the Scottish Ministers highlight the MCA recommendations on third party review."	The embedded mitigation measures assumed are presented in **Section 14.8.3.**
		"With regard to the potential cumulative effects, the Scottish Ministers highlight the MCA, CoS and RYA representations and advise their comments and recommendations should be fully considered and addressed."	Cumulative assessment methodology is presented in **Section 3.3, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** with cumulative tiering considering a radius of up to 50 nm from the OAA. Cumulative assessment is presented in **Section 17, Volume ER.A.4, Annex 14.1: Navigation Risk Assessment** and **Section 14.13** which includes port access and displacement.
		"In relation to transboundary impacts, the Scottish Ministers agree that transboundary impacts need to be considered as proposed within the Scoping Report."	Noted.
Tidewater	13 September 2023; Email correspondence	Vessels would keep clear of the wind farm, with passage plans taking the presence of project vessels and traffic density into consideration while complying with the requirements of safe navigation.	Vessel displacement and associated collision risk has been assessed. The risk assessment is provided in **Section 14.11**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Sentinel Marine	13 September 2023; Email correspondence	The presence of the Offshore Development might impact regular passages but this would be solved by small alternations. There are no safety concerns to their vessels, with the vessels staying clear of the Offshore Development. The floating foundations would be treated the same as fixed foundations.	Vessel displacement and associated collision risk has been assessed. The risk assessment is provided in **Section 14.11**.
North Star Shipping	13 September 2023; Email correspondence	Vessels coming to Aberdeen from locations to the northeast would have to alter course by a few degrees but this would have low impact on time and cost and would be allowed for in the passage planning. There are concerns with regards to errant vessels, noting again the incorporation into passage plans being key. Vessels would pass either side of the array (not within) and preferably down wind. The operator would view floating foundations the same as fixed foundations and the same avoiding actions would be taken.	Vessel displacement and associated collision risk has been assessed, in addition to allision risk. The risk assessment is provided in **Section 14.11**.
Scottish White Fish Producers Association (SWFPA)	28 September 2023; Hazard Workshop	Noted the importance of cumulative assessment (including Innovation and Targeted Oil & Gas (INTOG) projects).	Cumulative risk assessment is undertaken in **Section 14.13**.
		Noted that, although the incident data appears representative, the potential for an increase in incident rates associated with the Offshore Development needs to be considered.	Impacts on emergency response have been assessed including in relation to potential for changes in incident rates. The risk assessment is provided in **Section 14.11**.
		Asked if project vessel transits to/from the Offshore Development would be considered.	Impacts associated with project vessels have been assessed. The risk assessment is provided in **Section 14.11**.
		Noted that the decision of whether to transit through is made by each skipper based on their individual risk assessment, based on various factors including weather conditions and which mooring configuration was being used.	Vessel displacement and impacts associated with subsea infrastructure have been assessed. The risk assessment is provided in **Section 14.11**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Scottish White Fish Producers Association (SWFPA)	28 September 2023; Hazard Workshop	Stated that there is less concern regarding the Offshore Export Cable Corridor as impacts such as the cable installation and burial process would be temporary, and noted that MGN 654 includes requirements around underkeel reduction from cable protection.	Impacts associated with the Offshore Export Cable Corridor have been assessed. The risk assessment is provided in **Section 14.11**.
		Stated that recreational users would likely prefer to deviate due to the size of the turbines and platforms. Also stated that they may be less comfortable transiting through a site that uses floating foundations.	Vessel displacement including to recreational vessels has been assessed. The risk assessment is provided in **Section 14.11**.
		Stated that traffic volume will increase due to the presence of service vessels but that the VMP will mitigate the risk if implemented correctly.	Impacts associated with project vessels have been assessed. The risk assessment is provided in **Section 14.11**.
		Stated that, in relation to Radio Detection and Ranging (Radar) effects, the Wind Turbine Generators (WTGs) are large but the OAA has small spatial extent.	Associated impacts have been fully assessed in **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**
Scottish Pelagic Fishermen's Association (SPFA)	28 September 2023; Hazard Workshop	Stated that larger fishing vessels would likely deviate around the OAA.	Vessel displacement including to fishing vessels has been assessed. The risk assessment is provided in **Section 14.11**.
NLB	28 September 2023; Hazard Workshop	Noted the importance of cumulative assessment.	Cumulative risk assessment undertaken in **Section 14.13**.
		Expressed agreement that relatively large commercial vessels would likely avoid the OAA.	Vessel displacement and associated collision risk has been assessed. The risk assessment is provided in **Section 14.11**.
		Lighting would likely be required for every WTG given their limited number, but would depend on the final layout.	As per **Section 14.8.3**, lighting and marking will be agreed with NLB post consent.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
NLB	28 September 2023; Hazard Workshop	Noted that the loss of station hazard should be considered.	Impacts associated with loss of station have been assessed. The risk assessment is provided in **Section 14.11**.
		Noted that impacts on SAR should be considered.	Impacts on emergency response have been assessed. The risk assessment is provided in **Section 14.11**.
		Noted that the impact of EMF effects on compasses should be considered.	HVAC cables will be used and their EMF effects have been considered in **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**
Montrose Port Authority	28 September 2023; Hazard Workshop	Oil and gas vessels to/from the port would likely deviate.	Vessel displacement and associated collision risk has been assessed. The risk assessment is provided in **Section 14.11**.
MCA	13 October 2023; Meeting	MCA noted safety zones were only considered effective mitigations if they were suitably monitored and policed.	Appropriate procedures will be set out in the safety zone application (see **Section 14.8.3).**
		MCA confirmed no concern with use of subsea hubs given the water depths.	Considered in risk assessment (**Section 14.11**).
		MCA confirmed no concern with EMF effects given the Offshore Export Cable(s) will be HVAC.	EMF effects have been considered in **Volume ER.A.4, Annex 14.1: Navigation Risk Assessment**
		MCA noted that consultation from fishing stakeholders should be considered.	NRA process has included consultation with fishing vessel stakeholders including at the Hazard Workshop.
		MCA agreed it was appropriate that the worst-case draughts of the vessel types that may pass in proximity to the infrastructure based on consultation be used for underkeel risk assessment, rather than all vessel types.	Under keel clearance has been assessed in **Section 14.11**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
UK Chamber of Shipping	20 October 2023; Meeting	Confirmed no concern with use of subsea hubs given the water depths, but noted that charting of these should be discussed with NLB.	See **Section 14.8.3**, provision of infrastructure locations including subsea hubs to the United Kingdom Hydrographic Office (UKHO) for charting purposes will be undertaken, and this will also be discussed with NLB.
		Queried a minimum buoyancy module depth to leave enough room for under keel clearance.	See **Section 15.5**, **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**
		Queried terminus ports and sizes of tankers recorded within vessel traffic survey data.	See Section **10.1.3.5**, **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment** for further detail.
		Suggested NRA should include draught details per vessel type.	See **Section 15.5**, **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**
		Queried maintenance strategy in particular whether WTGs would be towed from site. Noted agreement with NLB input (see above) that all WTGs should display marine lights to mitigate impact of towing a WTG from site.	As per **Section 14.8.3**, final lighting and marking will be agreed with NLB post consent, noting that initial input is that all WTGs will be lit (see above).
RYA Scotland	15 December 2023; Email correspondence	"As the data show some recreational craft are likely to pass through the site with the numbers registering on AIS in August being an underestimate".	The vessel traffic surveys include account of non AIS traffic, and are based on the data collection requirements of MGN 654 (MCA, 2021).
		"Some may choose to go round the site but others will pass through it judging by experience elsewhere. As these will largely be vessels on passage between continental Europe and the UK and vice versa their skippers will be used to navigating round oil and gas platforms."	Displacement has been assessed in **Section 14.11**.

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
RYA Scotland	15 December 2023; Email correspondence	"Most skippers rely on electronic charts and there is a significant time lag between receipt of the updates by the UKHO and the availability of revised charts from providers of recreational charts. Also, boat owners may not download the latest charts. In RYA Scotland we encourage boaters to use Kingfisher but the traffic through the site is likely to include vessels based in continental Europe who may be unaware of this source of information."	Promulgation of information including Notice to Mariners is a key mitigation as per **Section 14.8.3**.

14.5 Study Area

14.5.1.1 The Shipping and Navigation Study Area has been defined as 10 nautical mile (nm) Study Area around the Offshore Array Area (OAA) (hereafter the 'EIA Study Area'). The 10 nm Study Area is standard for Shipping and Navigation and has been used in the majority of publicly available UK offshore wind farm NRAs and within the Shipping and Navigation assessment in the Salamander EIA Scoping Report (SBES, 2023). The 10 nm radius allows for capture of routes passing in proximity which may be impacted, while still remaining site specific to the area of interest. A Study Area of 2 nm has also been applied around the Offshore Export Cable Corridor (ECC) (hereafter the 'EIA Cable Corridor Study Area').

14.5.1.2 Both the EIA Study Area and EIA Cable Corridor Study Area have been shared with key stakeholders and presented at the hazard workshop. These Study Areas for Shipping and Navigation are shown in **Figure 14-1**.

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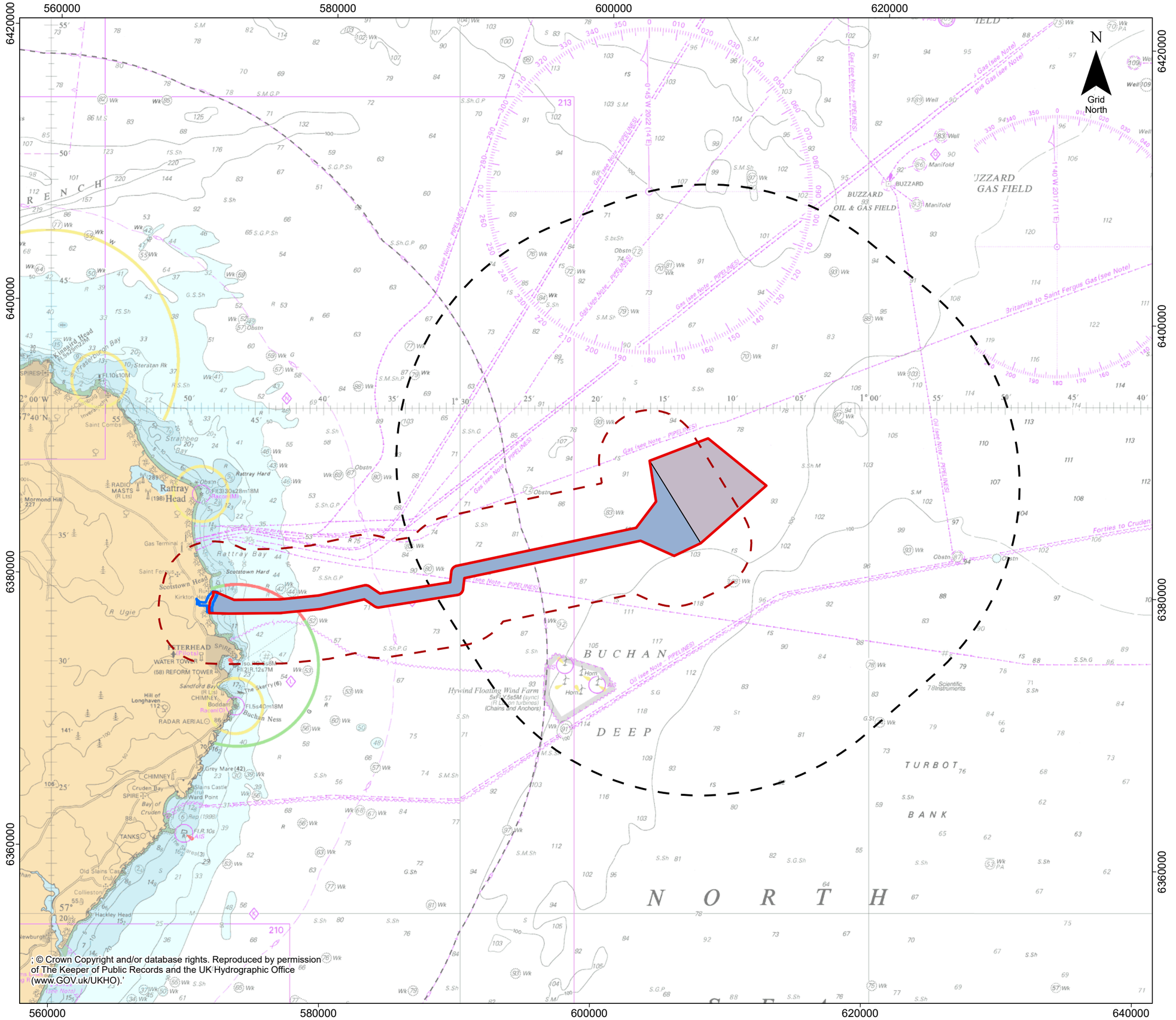
Figure 14-1

Overview of Study Areas



Legend

- Offshore Development Area
- Offshore Array Area
- Offshore Export Cable Corridor
- Indicative Onshore Development Area
- EIA Study Area
- EIA Cable Corridor Study Area
- 12 nm limit

Coordinate System: WGS 1984 World Mercator

Vertical Datum : MLLW

Scale @ A3 : 1:500,000

0 10 20 Kilometers

0 4 8 16 Nautical Miles

Rev	Description	Date
00	Final	27/11/2023
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Doc. Title : Overview of Study Areas
Doc. No : SWF01ER0000
Created by : DS
Checked by : JaC
Approved by : AF

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14.6 Methodology to Inform Baseline

14.6.1 Site Specific Surveys

14.6.1.1 In order to provide site specific and up to date information on which to base the impact assessment and in line with MGN 654 (MCA, 2021) requirements, two vessel traffic surveys were conducted as presented in **Table 14-3.**

Table 14-3 Vessel Traffic Surveys

Survey	Conducted by	Outcome of Survey
14 day vessel traffic survey in February 2023 (winter)	Vessel: Star of Hope, in liaison with Anatec Ltd	28 days total of MGN 654 compliant vessel traffic survey data collected.
14 day vessel traffic survey in August 2023 (summer)	Vessel: Star of Hope, in liaison with Anatec Ltd	

14.6.2 Data Sources

14.6.2.1 The additional desktop data sources that have been used to inform the Shipping and Navigation Chapter of the EIA Report are presented within **Table 14-4**.

Table 14-4 Summary of key publicly available desktop datasets for Shipping and Navigation

Source	Year	Spatial Coverage	Summary
28 days Automatic Identification System (AIS) data covering Offshore Export Cable Corridor	2023 (periods match the vessel traffic surveys)	EIA Cable Corridor Study Area	AIS data used to establish the vessel traffic baseline for the Offshore Export Cable Corridor.
Anatec's ShipRoutes database	2023	EIA Study Area	Secondary data source used to validate the vessel traffic survey findings. Includes long term vessel routeing patterns within UK waters.
Vessel Monitoring System data from the Marine Directorate	2022	EIA Study Area	To supplement the AIS in characterising fishing vessel traffic.
Maritime Accident Investigation Branch (MAIB) marine accidents database	2002-2021	EIA Study Area and EIA Cable Corridor Study Area	Used to establish marine incident baseline.
Royal National Lifeboat Institution (RNLI) incident data	2011-2020	EIA Study Area and EIA Cable Corridor Study Area	Used to establish marine incident baseline.

Source	Year	Spatial Coverage	Summary
Department for Transport (DfT) UK civilian SAR helicopter taskings	2015-2021	EIA Study Area and EIA Cable Corridor Study Area	Used to establish marine incident baseline.
UK Coastal Atlas of Recreational Boating 2.1 (RYA, 2019)	2019	EIA Cable Corridor Study Area	Used to inform baseline for recreational vessels.
Admiralty Charts 213, 1409 and 278 (UKHO, 2022/23).	2022/2023	EIA Study Area and EIA Cable Corridor Study Area	Characterising navigational features in proximity to the Offshore Development.
Admiralty Sailing Directions NP54 (UKHO, 2021).	2021	EIA Study Area and EIA Cable Corridor Study Area	Characterising navigational features in proximity to the Offshore Development.

14.7 Baseline Environment

14.7.1 Existing Baseline

14.7.1.1 This section uses the data sources as per **Section 14.6** to characterise the Shipping and Navigation baseline in terms of navigational features, vessel traffic and marine incidents. Full assessment has been undertaken within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with a summary provided below.

Navigational Features

14.7.1.2 The navigational features in proximity to the Offshore Development are presented in **Figure 14-2**.

14.7.1.3 Multiple charted pipelines are in proximity to the Offshore Development, many of which connect to the *St Fergus Gas Terminal;* one of these is the *Fulmar to Saint Fergus* pipeline which intersects the Offshore ECC. The closest pipeline to the OAA is the *Britannia to Saint Fergus* pipeline which lies 0.5 nm to its northwest.

14.7.1.4 The Hywind Scotland Offshore Wind Farm is located 6.3 nm southwest of the OAA and comprises five floating WTGs. A subsea export cable connecting to this wind farm lies 0.3 nm south of the Offshore ECC at its closest point.

14.7.1.5 Peterhead is the main port in the vicinity of the Offshore Development, located approximately 2 nm from the southern boundary of the Offshore ECC, with a pilot boarding station at its entrance. Other key ports include Aberdeen and Montrose, which vessels in the area commonly transit to/from based on vessel traffic assessment.

14.7.1.6 Charted wrecks and obstructions are located in proximity to the Offshore Development, becoming sparser further offshore. Two are located within the Offshore ECC, between 2 nm and 3 nm from shore.

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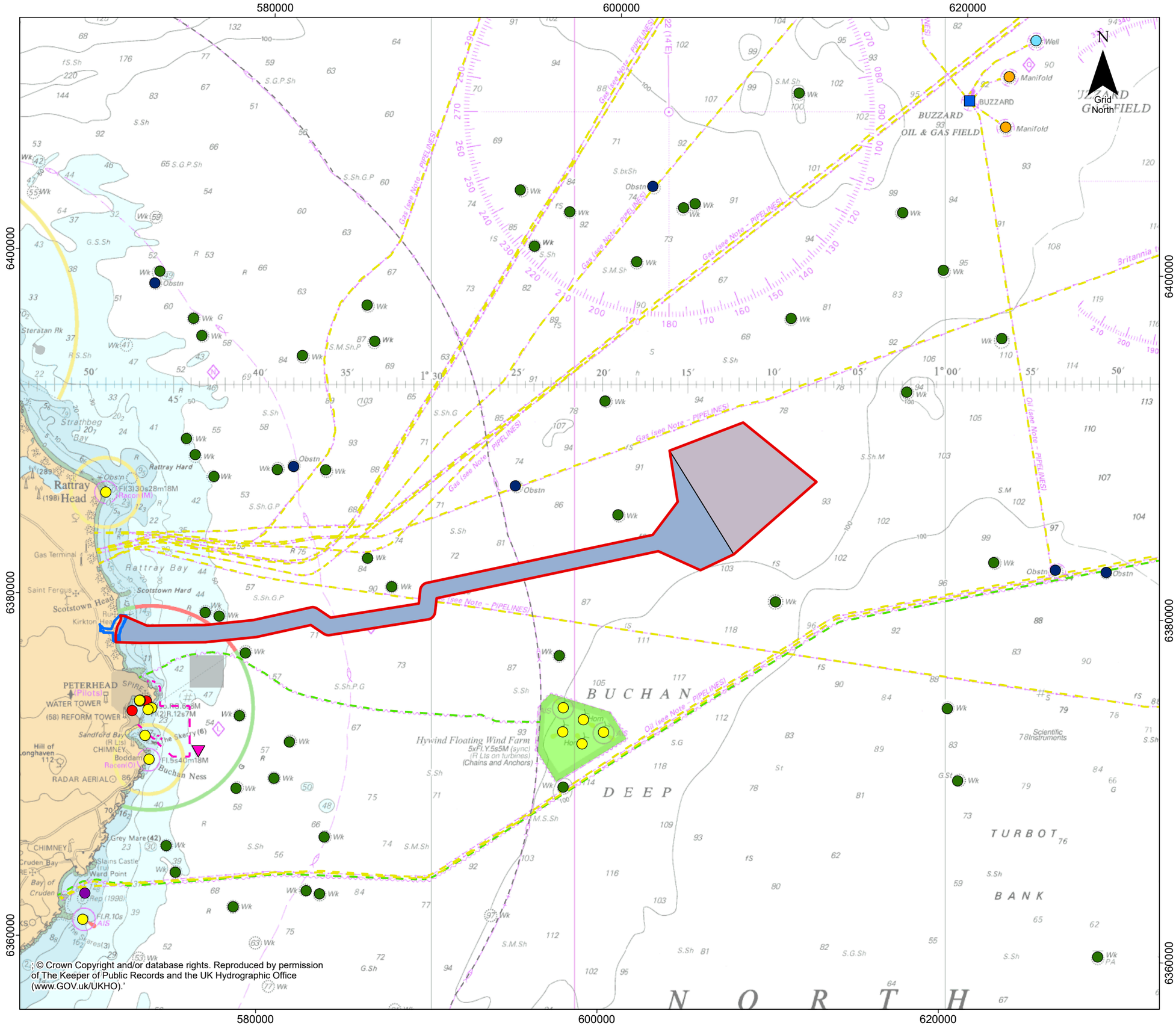
Figure 14-2

Navigational Features



Legend

- Offshore Development Area
- Offshore Array Area
- Offshore Export Cable Corridor
- Indicative Onshore Development Area
- 12 nm limit

Navigational Features

- Aid to Navigation
- Charted Wreck
- Charted Obstruction
- Platform
- Manifold
- Well
- Pilot Boarding Station
- Reported Anchorage
- Port/Harbour/Marina
- Subsea Pipeline
- Subsea Cable
- Authority Limit
- Spoil Ground
- Hywind Offshore Wind Farm

Coordinate System: WGS 1984 World Mercator

Vertical Datum : MLLW

Scale @ A3 : 1:400,000

0 10 20 Kilometers

0 3 6 12 Nautical Miles

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Created by : DS
Checked by : JaC
Approved by : AF

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Vessel Traffic

14.7.1.8 **Figure 14-3** presents the 28 days of vessel traffic data recorded within the EIA Study Area during the vessel traffic surveys, colour-coded by vessel type. Following this, **Figure 14-4** presents the vessel traffic data recorded on AIS within the EIA Cable Corridor Study Area during the same periods.

14.7.1.9 Vessel traffic within the EIA Study Area largely consisted of fishing vessels and oil and gas vessels in northeast/southwest transit, with higher vessel density seen in the northern extent of the EIA Study Area compared to the southern extent. Within the EIA Cable Corridor Study Area, traffic was observed to be most dense nearshore.

14.7.1.10 An average of 28 vessels per day was recorded during the winter period, compared to 35 vessels per day during the summer period. Within the OAA itself, there was an average of three per day during the winter and five per day during the summer.

14.7.1.11 Behaviour suggestive of active fishing (based on average speeds and track behaviour) was observed at various locations within the EIA Study Area, however no such behaviour was observed within the OAA itself.

14.7.1.12 No clear anchoring activity was observed within the EIA Study Area or in proximity to the Offshore ECC.

14.7.1.13 The vessel traffic survey data was used to identify the main commercial routes based on the principles set out in MGN 654 (MCA, 2021). The routes identified are shown in

14.7.1.14 **Figure 14-5,** with associated details then provided in **Table 14-5**

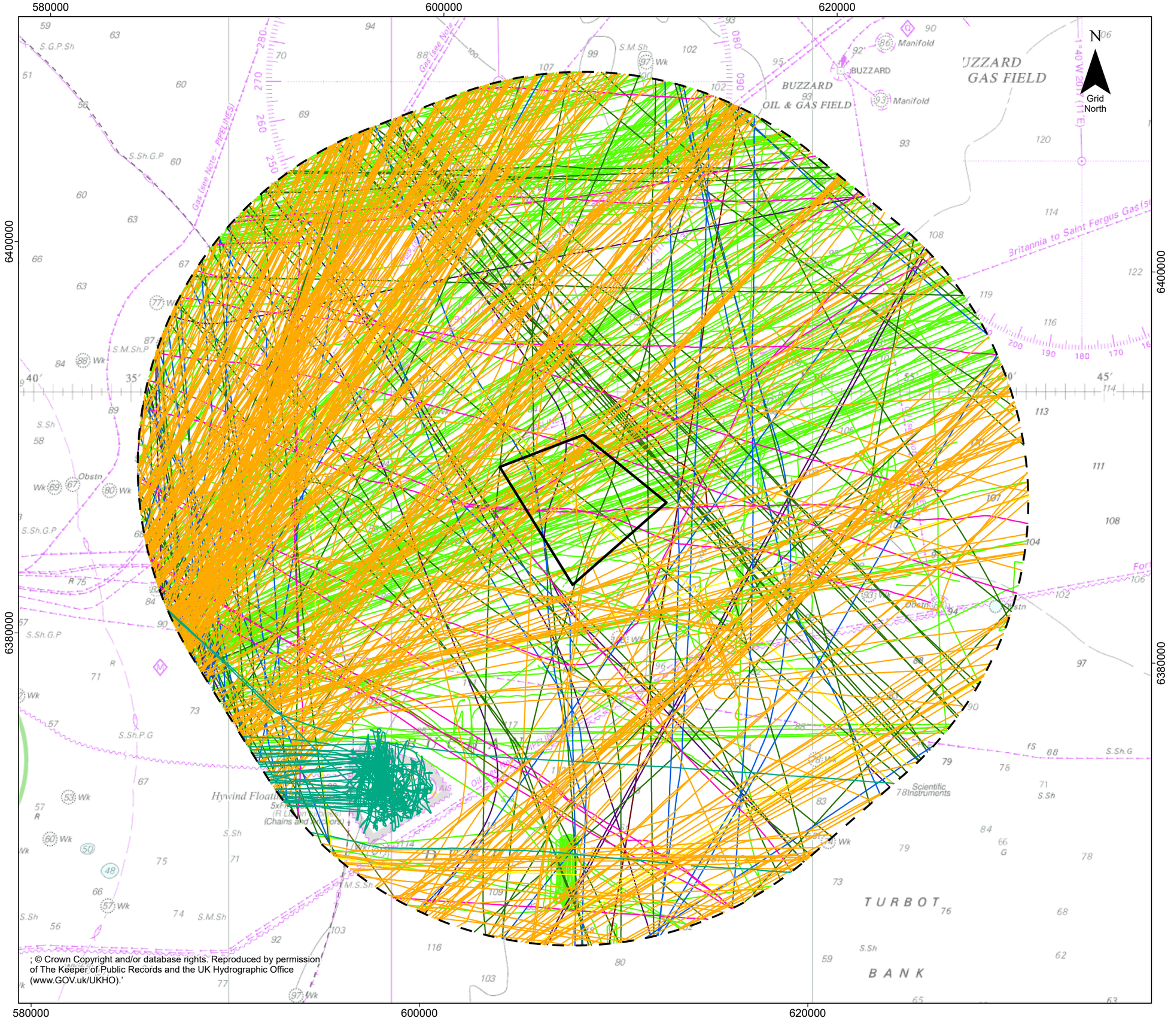

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Figure 14-3

Vessels by Type (28-Days, Winter and Summer Collected During 2023)

Legend

- Offshore Array Area
- EIA Study Area
- 12 nm limit

Vessel Type

- Unspecified
- Fishing
- Military
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Oil and Gas
- Wind Farm

Coordinate System: WGS 1984 World Mercator

Vertical Datum : MLLW Scale @ A3 : 1:350,000

0 10 20 Kilometers

0 2.5 5 10 Nautical Miles

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Doc. No : SWF01ER0000
Created by : DS
Checked by : JaC
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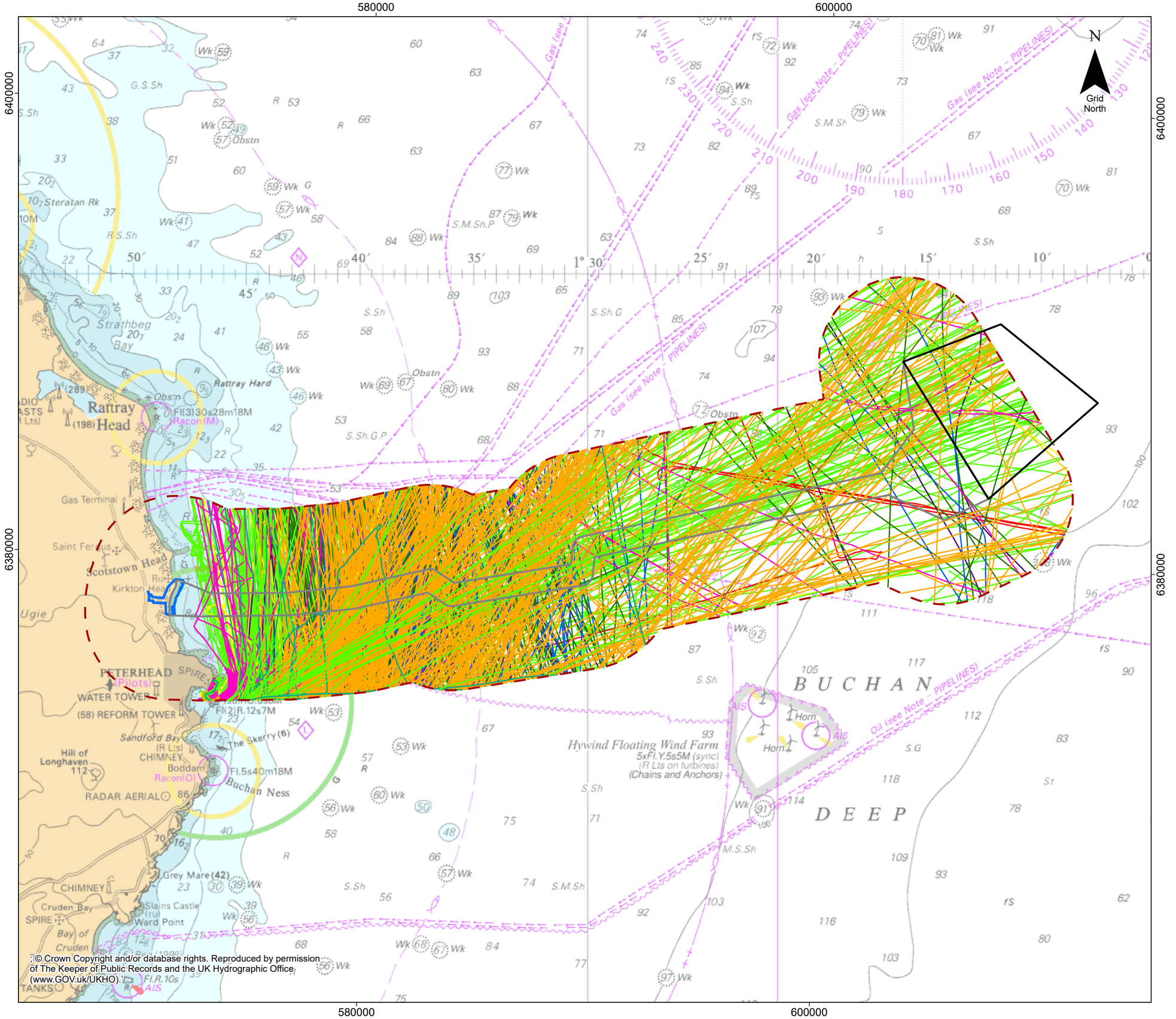
Figure 14-4

Vessels by Type within EIA Cable Corridor Study Area (28-Days, Winter and Summer Collected During 2023)



Legend

- Offshore Array Area
- Offshore Export Cable Corridor
- Indicative Onshore Development Area
- EIA Cable Corridor Study Area

Vessel Type

- Fishing
- Dredger/Underwater Ops
- Tug
- Passenger
- Cargo
- Tanker
- Other
- Recreational
- Oil and Gas
- Wind Farm

Coordinate System: WGS 1984 World Mercator

Vertical Datum : MLLW

Scale @ A3 : 1:300,000

0 9 18 Kilometers

0 2 4 8 Nautical Miles

Rev	Description	Date
00	Final	27/11/2023
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Doc. Title : Vessels by Type within EIA Cable Corridor Study Area (28-Days, Winter and Summer Collected During 2023)

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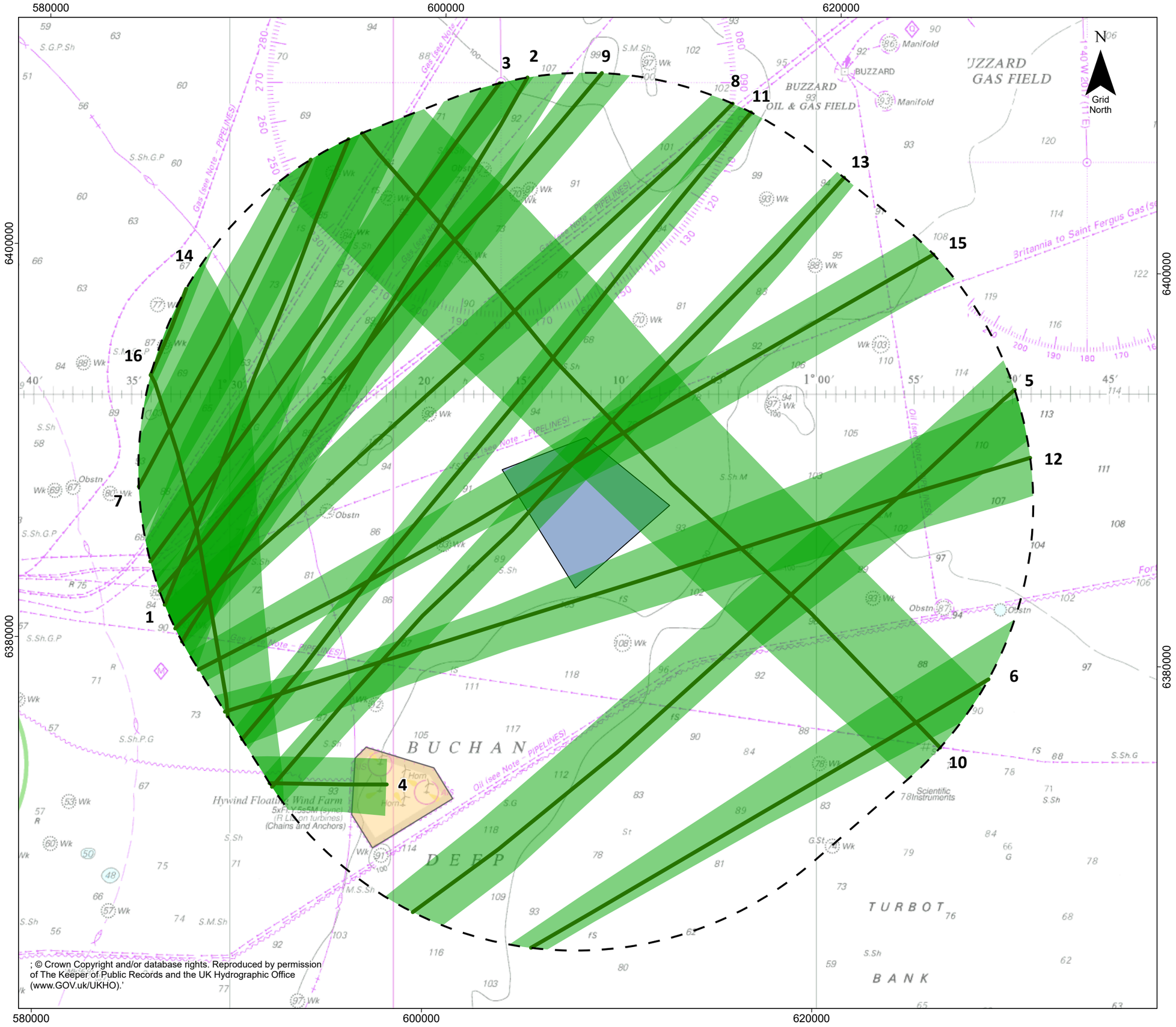

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Figure 14-5

Main Commercial Routes within EIA Study Area (Pre Wind Farm)

Legend

- Offshore Array Area
- EIA Study Area
- 90th Percentile
- Main Route
- Hywind Offshore Wind Farm

Coordinate System: WGS 1984 World Mercator

Vertical Datum : MLLW

Scale @ A3 : 1:350,000

0 10 20 Kilometers

0 2.5 5 10 Nautical Miles

Rev	Description	Date
00	Final	27/11/2023
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Doc. Title : Main Commercial Routes within EIA Study Area (Pre Wind Farm)
Doc. No : SWF01ER0000
Created by : DS
Checked by : JaC
Approved by : AF

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Table 14-5 Details of main commercial routes

Route Number	Average Vessels per Week	Description
1	17	Aberdeen – various oil and gas infrastructure. Used entirely by oil and gas vessels.
2	11 – 12	Aberdeen – various oil and gas infrastructure. Used almost entirely by oil and gas vessels (96%).
3	9	Peterhead – various oil and gas infrastructure. Used entirely by oil and gas vessels.
4	7 – 8	Peterhead – Hywind Scotland. Used entirely by wind farm support vessels.
5	7	Aberdeen – various oil and gas infrastructure. Used almost entirely by oil and gas vessels (96%).
6	7	Aberdeen – Piper B. Used almost entirely by oil and gas vessels (89%).
7	5 – 6	Peterhead – various oil and gas infrastructure. Used entirely by oil and gas vessels.
8	5	Peterhead – various oil and gas infrastructure. Used entirely by oil and gas vessels.
9	5	Peterhead – various oil and gas infrastructure. Used entirely by oil and gas vessels.
10	5	Europe – America. Used almost entirely by cargo vessels (95%).
11	4 – 5	Aberdeen – various oil and gas infrastructure. Used entirely by oil and gas vessels.
12	4 – 5	Peterhead – various oil and gas infrastructure. Used almost entirely by oil and gas vessels (88%).
13	4 – 5	Aberdeen – various oil and gas infrastructure. Used entirely by oil and gas vessels.
14	4	Peterhead – various oil and gas infrastructure. Used entirely by oil and gas vessels.
15	3 – 4	Peterhead – Global Producer 3. Used entirely by oil and gas vessels.
16	3 – 4	Various. Used by tankers (64%), cargo vessels (21%) and passenger vessels (14%).

Emergency Response Resources and Historical Maritime Incidents

14.7.1.15 The SAR helicopter service is operated by the Bristow Group, with the nearest base being located at Inverness, approximately 78 nm west of the Offshore ECC. Between April 2015 and March 2021, a total of seven helicopter taskings occurred within the EIA Study Area corresponding to an average of just over one per year.

14.7.1.16 The closest RNLI station to the Offshore Development is at Peterhead, which houses an active All-Weather Lifeboat (ALB). Between 2011 and 2020, a total of eight lifeboat responses occurred within the EIA Study

Area, corresponding to an average of less than one per year. During the same period, a total of 58 lifeboat responses to 48 unique incidents occurred within the EIA Cable Corridor Study Area corresponding to an average of five unique incidents per year.

14.7.1.17 Between 2012 and 2021, a total of six incidents occurred within the EIA Study Area corresponding to an average of less than one per year. During the same period, a total of 28 incidents occurred within the EIA Cable Corridor Study Area corresponding to an average of three per year. Compared to the previous 10 years (2002 – 2011) there has been a slight decrease in the rate of incidents; during this period, eight incidents occurred within the EIA Study Area and 37 incidents within the EIA Cable Corridor Study Area.

14.7.1.18 No incidents occurred within the OAA itself. Emergency response resources and maritime incidents are discussed in further detail within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**.

14.7.2 Future Baseline

14.7.2.1 Future traffic levels are dependent on market conditions, and fluctuations are therefore difficult to predict, however the current accepted trend is that vessel size will increase, as per a study undertaken by the International Transport Forum (ITF) at the Organisation for Economic Cooperation and Development (OECD) on the impact of 'Mega Ships' (OECD / ITF, 2015).

14.7.2.2 The installation of offshore wind farms in the UK is set to continue and there are a number of projects within Scottish waters at varying stages of development with further projects expected. This will lead to increased wind farm vessel traffic and may also impact how all vessels in the area route.

14.7.2.3 No indication was made during consultation that any significant changes to recreational vessel volumes or behaviours will occur. Fishing vessel trends are discussed and considered further in **Volume ER.A.3, Chapter 13: Commercial Fisheries**.

14.7.2.4 There is the potential that climate change and also the measures taken to slow the effects of climate change could have both a negative and positive effect on Shipping and Navigation receptors. However, given the likely temporal nature of climate change, any effects are expected to develop in the long-term rather than the short or medium term. It is not possible to be fully cognisant of future case climate change parameters and therefore any assessment of positive or negative effects is not considered reasonable nor will it provide a conclusive assessment. However, it is likely that changes to international conventions regulating the shipping industry will mitigate impacts associated with increased journey time and/or distance and that any changes to sea level or storm frequency are not likely to have a direct effect within the expected lifetime of the Salamander Project.

14.7.3 Summary of Baseline Environment

14.7.3.1 The following areas of sensitivity have been identified based on the baseline assessment:

- Vessel routeing intersecting the OAA, albeit low use routes and with room to deviate;
- Fishing vessels in transit intersecting and in proximity to the OAA, albeit with room to deviate; and
- Larger tankers and cargo vessels passing in proximity to the OAA, albeit in very low numbers and with room to deviate.

14.8 Limitations and Assumptions

14.8.1.1 The following limitations and assumptions have been identified for Shipping and Navigation:

- Cable corridor vessel traffic assessment is based on AIS data only i.e. non AIS vessels (e.g. recreational vessels and fishing vessels <15 m) may be underrepresented. Additional data sources and consultation input have therefore been considered.
- Non-UK vessels are not required to report accidents to the MAIB unless they are in a UK port, within territorial waters (noting that the OAA is located approximately 18 nm offshore at the closest point) or carrying passengers to a UK port. There are also no requirements for non-commercial recreational craft to report accidents to the MAIB.
- The RNLI incident data is not considered to be comprehensive of all incidents. Although hoaxes and false alarms are excluded, any incident to which an RNLI resource was not mobilised has not been accounted for in this dataset.
- UKHO admiralty charts are updated periodically and therefore the information shown may not reflect the real time features within the region with total accuracy. For aids to navigation, only those charted and considered key to establishing the Shipping and Navigation baseline are shown. Similarly for wrecks and obstructions, only those charted are shown.

14.8.2 Impacts Scoped Out of this Environmental Impact Assessment Report

14.8.2.1 The Shipping and Navigation assessment covers all potential impacts identified during scoping, as well as any further potential impacts that have been highlighted as the EIA has progressed as outlined in **Section 14.11**.

14.8.2.2 However, following consideration of the baseline environment, the project description outlined in **Volume ER.A.2, Chapter 4: Project Description** and **Volume ER.A.4, Annex 14.1 Navigational Risk Assessment** outputs, the following impact is not considered in detail within this EIAR, as illustrated in **Table 14-6**.

Table 14-6 Impacts scoped out of the Shipping and Navigation assessment

Potential Impact	Project Aspect	Project Phase	Justification
Interference with marine navigation, communications and position fixing equipment	All	All	Associated impacts have been fully assessed in **Volume ER.A.4, Annex 14.1 Navigational Risk Assessment** and found to be broadly acceptable. In view of this assessment outcome it was determined that no further assessment was required within the EIAR.

14.8.3 Embedded Mitigation

14.8.3.1 The embedded mitigation relevant to the Shipping and Navigation assessment is presented in **Table 14-7**.

Table 14-7 Embedded mitigation for the Shipping and Navigation assessment

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
Primary				
Vessel to structure allision risk	Co35	Blade clearance of ≥ 22 m above MHWS (in line with RYA policy (RYA, 2019)).	OAA	Construction, Operation and Maintenance , and Decommissioning
Reduction of under keel clearance from cable protection Anchor interaction with subsea cables	Co14	Avoidance of sensitive features during cable routeing wherever practicable. Cables will be buried as the primary cable protection method, however other cable protection methods will be used where adequate burial cannot be achieved. A Cable Burial Risk Assessment (CBRA) will be completed to determine suitable cable protection measures, and will be implemented within relevant Project plans.	Offshore ECC and OAA	Construction and Operation and Maintenance,
Tertiary				
Reduction of under keel clearance from cable protection Interaction with subsea infrastructure Anchor interaction with subsea cables	Co30	A Cable Plan will be produced prior to construction of the Offshore Export Cable(s) which will include; details of cable depth of lowering; a detailed cable laying plan which ensures safe navigation is not compromised; details of cable protection for each cable crossing; and proposals for monitoring of offshore cable.	Offshore ECC and OAA	Construction, Operation and Maintenance, and Decommissioning
Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel	Co24	Standard 500 m safety zones will be applied around substructure elements during construction, decommissioning and major maintenance works and safety zones of up to 50 m during pre-commissioning works. Additionally, 500 m advisory safe passing distance will also be requested around all project	Offshore ECC and OAA	Construction, Operation and Maintenance, and Decommissioning

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
Vessel to structure allision risk		vessels undertaking major works and restriction of navigation rights within the OAA will be considered under Section 36A.		
Vessel Displacement Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Reduced access to local ports Reduction of emergency response capability	Co11	A VMP will be developed and include details of: - Vessel routeing to and from construction sites and ports, - Vessel notifications including Notice to Mariners and Kingfisher Bulletin; and - Code of conduct for vessel operators including for the purpose of reducing disturbance and collision with marine fauna.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning
Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Interaction with wet stored subsea infrastructure Reduction of emergency response capability	Co36	The Salamander Project will utilise Guard vessel(s) as required by risk assessment.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Reduction of emergency response capability Loss of Station	Co33	Compliance with MGN 654 and its annexes, and completion of a SAR checklist where applicable.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning
Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Reduction of emergency response capability Loss of Station	Co31	An Emergency Response Cooperation Plan (ERCoP) will be developed through consultation with the Maritime Coastguard Agency (MCA) which will encompass appropriate risk assessments and designated evacuation plans for site personnel in the unlikely event of a fire breaking out on board vessels supporting the Offshore Development.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning
Vessel Displacement Increased vessel to vessel collision risk	Co34	The Salamander Project will provide details of offshore development to facilitate appropriate marking of all infrastructure on UKHO Admiralty Charts to the UKHO.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Interaction with wet stored subsea infrastructure Reduction of under keel clearance from cable protection Interaction with subsea infrastructure Anchor interaction with subsea cables				
Vessel Displacement Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk	Co53	Approval and implementation of a Lighting and Marking Plan (LMP) in agreement with Northern Lighthouse Board (NLB) and International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA). LMP will be in line with IALA Recommendation G1162 (IALA, 2021) including a buoyed construction area if required by NLB.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
Reduction of emergency response capability Interaction with subsea infrastructure				
Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel Vessel to structure allision risk Reduction of emergency response capability	Co9	Construction Environmental Management Plan (CEMP) will be developed and will include details of: - A Marine Pollution Contingency Plan (MPCP) to address the risks, methods and procedures to protect the Offshore Development Area from potential polluting events associated with the Salamander Project; - A chemical risk review to include information regarding how and when chemicals are to be used, stored and transported in accordance with recognised best practice guidance; - A biosecurity plan (offshore) detailing how the risk of introduction and spread of invasive non-native species will be minimised; - Waste management and disposal arrangements; and - Protocol for management of Dropped Objects.	Offshore ECC and OAA	Construction
Increased vessel to vessel collision risk between third-party vessels Increased vessel to vessel collision risk between a third-party	Co10	Operational Environmental Management Plan (OEMP) will be developed and will include details of: - A MPCP to address the risks, methods and procedures to protect the Offshore Development Area from potential polluting events associated with the Salamander Project; and	Offshore ECC and OAA	Operation and Maintenance,

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
vessel and a Salamander Project vessel Vessel to structure allision risk		- Waste management and protection of the marine environment.		
Vessel to structure allision risk Reduced access to local ports Interaction with wet stored subsea infrastructure Reduction of emergency response capability Reduction of under keel clearance from cable protection Interaction with subsea infrastructure Loss of station Anchor interaction with subsea cables	Co18	All vessels will comply with relevant best practice navigational safety guidance from the International Regulations for the Prevention of Collisions at Sea (COLREGS) and the international regulations for the Safety of Life at Sea (SOLAS).	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning
Reduction of under keel clearance from cable protection Interaction with subsea infrastructure Anchor interaction with subsea cables	Co45	Where scour protection is required, MGN 654 will be adhered to with respect to changes greater than 5% to the under keel clearance in consultation with the MCA.	Offshore ECC and OAA	Construction, Operation and Maintenance,, and Decommissioning

14.9 Project Design Envelope Parameters

14.9.1.1 Given that the realistic worst-case scenario is based on the design option (or combination of options) that represents the greatest potential for change, as set out in **Volume ER.A.2, Chapter 4: Project Description**, a

confidence can be taken that development of any alternative options within the Project Design Envelope parameters will give rise to no effects greater or worse than those assessed in this impact assessment. The Project Design Envelope parameters relevant to the Shipping and Navigation assessment are outlined in **Table 14-8**.

Table 14-8 Project Design Envelope parameters for Shipping and Navigation

Potential Impacts and Effect	Project Design Envelope Parameters
Construction	
Vessel displacement	• Maximum extent of OAA (with an area of 10 nm²) including any required construction buoyage; • Up to seven WTGs / floating substructures; • Up to eight mooring lines per substructure; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; • Use of 500 m construction safety zones and 50 m pre-commissioning safety zones; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length; • Up to two Offshore Export Cables with a total length of 85 km; • Up to two subsea hubs, l x b x h: 15 m x 15 x 10 m; • Construction phase lasting up to 18 months (offshore construction period has a window of 2.5 years, however, construction will only take place over a period of 18 months (excluding pre-construction surveys). Pre-construction surveys will occur prior to the 18 month construction period); and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel	• Maximum extent of OAA (with an area of 10 nm²) including any required construction buoyage; • Use of 500 m construction safety zones and 50 m pre-commissioning safety zones; • Up to two Offshore Export Cables with a total length of 85 km; • Construction period lasting up to 18 months; and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Increased vessel to vessel collision risk between third-party vessels	• Maximum extent of OAA (with an area of 10 nm²) including any required construction buoyage; • Up to seven WTGs / floating substructures; • Up to eight mooring lines per substructure;

Potential Impacts and Effect	Project Design Envelope Parameters
	• Semi-submersible substructures with surface dimensions of up to 140 × 140 m; • Use of 500 m construction safety zones and 50 m pre-commissioning safety zones; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length; • Up to two Offshore Export Cables with a total length of 85 km; • Up to two subsea hubs, l x b x h: 15 m x 15 x 10 m; • Construction period lasting up to 18 months; and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Vessel to structure allision risk	• Full buildout of OAA (with an area of 10 nm^2); • Up to seven WTGs / floating substructures; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; • Construction period lasting up to 18 months; and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Reduced access to local ports	• Up to two Offshore Export Cables with a total length of 85 km; • Construction period lasting up to 18 months; and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Interaction with wet stored subsea infrastructure	• Up to seven WTGs / floating substructures; • Wet storage within water column of up to eight mooring lines per substructure; • Wet storage of dynamic cables in the water column; and • Construction period lasting up to 18 months.
Reduction in Emergency Response Capability	• Maximum extent of OAA (with an area of 10 nm^2) including any required construction buoyage; • Up to seven WTGs / floating substructures; • Up to eight mooring lines per substructure; • Mooring line radius up to 1,500 m; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; • Up to two Offshore Export Cables with a total length of 85 km; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length;

Potential Impacts and Effect	Project Design Envelope Parameters
	• Up to two subsea hubs, l x b x h: 15 m x 15 x 10 m; • Construction period lasting up to 18 months; and • Up to 40 construction vessels (with up to 12 vessels and a support barge maximum simultaneously).
Operation and Maintenance	
Vessel displacement	• Full buildout of OAA (with an area of 10 nm^2); • Up to seven WTGs; • Up to eight mooring lines per substructure; • Semi-submersible foundations with surface dimensions of up to 140 × 140 m; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length; • Use of 500 m major maintenance safety zones; and • Operational life of up to 35 years.
Increased vessel to vessel collision risk between third-party vessels	• Full buildout of OAA (with an area of 10 nm^2); • Up to seven WTGs; • Up to eight mooring lines per substructure; • Semi-submersible foundations with surface dimensions of up to 140 × 140 m; • Use of 500 m major maintenance safety zones; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length; • Up to 210 vessel trips per year, maximum of up to 12 vessels in the OAA and Offshore ECC per day; and • Operational life of up to 35 years.
Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel	• Full buildout of OAA (with an area of 10 nm^2); • Up to 210 vessel trips per year, maximum of up to 12 vessels in the OAA and Offshore ECC per day; and • Operational life of up to 35 years.
Vessel to structure allision risk	• Full buildout of OAA (with an area of 10 nm^2); • Up to seven WTGs; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; and • Operational life of up to 35 years.

Potential Impacts and Effect	Project Design Envelope Parameters
Reduced access to local ports	• Full buildout of OAA (with an area of 10 nm²); • Up to two Offshore Export Cables with a total length of 85 km; • Up to 210 vessel trips per year, maximum of up to 12 vessels in the OAA and Offshore ECC per day; and • Operational life of up to 35 years.
Reduction of under keel clearance from cable protection	• Full buildout of OAA (with an area of 10 nm²); • Up to seven WTGs; • Up to two Offshore Export Cables with a total length of 85 km; • Up to 35 km of Inter-array Cables; • Buoyancy module section per dynamic cable end up to 100 m in length; • External protection where needed, with a height of up to 1.5 m; and • Operational life of up to 35 years.
Anchor Interaction	• Full buildout of OAA (with an area of 10 nm²); • Up to seven WTGs; • Up to two Offshore Export Cables with a total length of 85 km; • Up to 35 km of Inter-array Cables; • Buoyancy module section per dynamic cable end up to 100 m in length; • Cable depths of lowering are typically 1 – 2 m where technically feasible, with a minimum target depth of 0.6m and potentially a maximum of up to 4 m locally • External protection where needed, with a height of up to 1.5 m; • Up to eight mooring lines per substructure; • Up to two subsea hubs, l x b x h: 15 m x 15 x 10 m; • Mooring line radius up to 1,500 m; • Gravity anchors with diameter 13.5m; and • Operational life of up to 35 years.
Interaction with subsea infrastructure	• Full buildout of OAA (with an area of 10 nm²); • Up to seven WTGs; • Up to eight mooring lines per substructure; • Mooring line radius up to 1,500 m; • Up to 35 km of Inter-array Cables including use of dynamic cable sections; • Buoyancy module section per dynamic cable end up to 100 m in length; and • Operational life of up to 35 years.
Loss of station	• Full buildout of OAA (with an area of 10 nm²); • Up to seven WTGs; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; and • Operational life of up to 35 years.

Potential Impacts and Effect	Project Design Envelope Parameters
Reduction of emergency response capability	• Full buildout of OAA (with an area of 10 nm²); • Up to seven WTGs; • Semi-submersible substructures with surface dimensions of up to 140 × 140 m; • Up to 210 vessel trips per year, maximum of up to 12 vessels in the OAA and Offshore ECC per day; and • Operational life of up to 35 years.

Decommissioning

At this stage, the worst-case scenario envelope during decommissioning is considered equal to the worst-case scenario during construction, with the exception of vessel trips, noting that there will be a total of 21 vessels involved rather than the 40 during construction phase. It is assumed that the worst-case scenario will involve full removal of all infrastructure placed during the construction phase. This assumption is subject to best practice methods and technology appropriate at the time of decommissioning.

14.10 Assessment Methodology

14.10.1.1 **Volume ER.A.2, Chapter 6: EIA Methodology** sets out the general approach to the assessment of potential significant effects that may arise from the Salamander Project.

14.10.1.2 Whilst **Volume ER.A.2, Chapter 6: EIA Methodology** provides a general framework for identifying impacts and assessing the significance of their effects, in practice the approaches and criteria applied across different topics vary.

14.10.1.3 The approach to the Shipping and Navigation assessment is outlined below, noting this approach is required by the MCA under MGN 654 (MCA, 2021), and is as set out in the Salamander EIA Scoping Report (SBES, 2023) and presented at the hazard workshop.

14.10.2 Assessment Criteria

14.10.2.1 As per **Section 14.3**, the assessment of Shipping and Navigation impacts has been based on the FSA methodology noting this is the international standard for marine risk assessment, and is the approach required by the MCA under MGN 654 specifically Annex 1 (MCA, 2021).

14.10.2.2 Under the FSA, the criteria for determining the significance of each impact are based on the severity of consequence and frequency of occurrence, as determined by **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. The definitions for severity of consequence and frequency of occurrence in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment** and this chapter are outlined in **Table 14-9** and **Table 14-10** respectively.

Table 14-9 Severity of consequence

Severity of Consequence	Definition
Negligible	No perceptible risk to people, property, the environment or business.
Minor	Slight injury(s) to people;

Severity of Consequence	Definition
	Minor damage to property, i.e. superficial damage; Tier 1 environmental damage with local assistance required; and Minor reputational risk to business limited to users.
Moderate	Multiple minor or single serious injury to people; Damage to property not critical to operations; Tier 2 environmental damage with limited external assistance required; and Local reputational risk to business.
Serious	Multiple serious injuries or single fatality to people; Damage to property resulting in critical risk to operations; Tier 2 environmental damage with regional assistance required; and National reputational risk to business.
Major	Multiple fatalities to people; Total loss of property; Tier 3 environmental damage with national assistance required; and International reputational risk to business.

Table 14-10 Frequency of occurrence

Frequency of Occurrence	Definition
Negligible	Less than one occurrence per 10,000 years
Extremely unlikely	One per 100 to 10,000 years
Remote	One per 10 to 100 years
Reasonably probable	One per one to ten years
Frequent	Yearly

14.10.2.3 The significance of each impact assessed will then be determined via a risk ranking matrix based on the frequency and consequence of the impact, as presented in **Table 14-11**. For the purposes of the Shipping and Navigation assessment, impacts determined as being of Unacceptable significance are considered a 'significant' effect in terms of the EIA Regulations. Impacts determined to be tolerable are not significant assuming the risks have been reduced to As Low As Reasonably Practicable (ALARP).

Table 14-11 Risk ranking matrix for assessing significance of effect

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

14.11 Impact Assessment

14.11.1 Construction

14.11.1.1 Under the construction phase the following potential impacts have been assessed:

- Vessel displacement;
- Increased vessel to vessel collision risk between third-party vessels;
- Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel;
- Vessel to structure allision risk;
- Interaction with wet stored subsea infrastructure;
- Reduced access to local ports; and
- Reduction of emergency response capability.

Vessel Displacement

14.11.1.2 Based on operational experience of wind farms under construction, it is considered likely that commercial vessels will deviate to avoid the OAA during construction, which is anticipated to be marked as a buoyed construction area, noting that this will be directed by NLB. There will be no restrictions on entry other than

through any active safety zones, however experience indicates that commercial vessels will still avoid the construction works. This aligns with input received from commercial vessel operators who use the local area.

14.11.1.3 A total of 16 vessel routes were identified within the main routeing analysis in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, five of which were anticipated to deviate to avoid the OAA. The maximum deviation was 0.8 nm, to Route 13, used by less than a vessel a day on average. All other deviations were less than 0.3 nm (and again were to routes used by less than a vessel a day on average). This aligns with input received from commercial vessel operators who use the local area, which indicated any deviations would be minor.

14.11.1.4 Other smaller vessel types (e.g. fishing, recreation) may still choose to transit through the OAA during construction, noting this would be at the discretion of individual vessels. However, consultation input including at the hazard workshop indicated smaller vessels would likely still avoid the OAA given the deviations required would be small.

14.11.1.5 There may also be some minor displacement associated with the installation works within the Offshore ECC, however any such displacement would be temporary in nature and spatially limited to the area immediately around the operation.

14.11.1.6 The primary consequence of vessel displacement is considered to be increased journey times and distances for affected third-party vessels. However, as above any deviations are anticipated to be minor based both on the routeing analysis in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment** and consultation feedback, and can be safely accommodated by the searoom available around the OAA and the Offshore ECC. Vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the Salamander Project and display on the relevant nautical charts.

14.11.1.7 No specific concerns were raised in consultation regarding adverse weather routeing in the consultation process. It is likely that vessels will be more likely to avoid the OAA during adverse conditions, however there is room to accommodate the minor deviations that would be required.

14.11.1.8 The frequency of occurrence in relation to displacement of vessel traffic is considered **Reasonably Probable** given that minor deviations are anticipated to occur to a small number of vessels. Severity of consequence is considered **Negligible** given any deviations will be minor and can be safely accommodated. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Increased Vessel to Vessel Collision Risk Between Third-party Vessels

14.11.1.9 As discussed in the Vessel Displacement impact text above, any deviations and displacement of third-party traffic is anticipated to be minor, both in terms of the number of vessels affected and also the magnitude of the deviations. It is therefore considered unlikely that there will be a large increase in encounters and collision risk, noting that there is considered to be searoom to safely accommodate any displaced vessels. This aligns with the collision modelling undertaken within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, which estimated a vessel would be involved in a collision once per 1,147 years, representing an increase of only 3% from the pre wind farm scenario.

14.11.1.10 In addition to larger vessels, smaller vessels may also choose to avoid the OAA during construction, which is anticipated to be marked as a buoyed construction area, noting that this will be directed by NLB. This could lead to increased encounters with other larger commercial vessels. However, given the searoom available,

and noting any such encounters would be managed via COLREGs and SOLAS, it is considered unlikely that this would lead to any notable increase in collision risk between small vessels and larger commercial vessels.

14.11.1.11 In the event that an encounter between vessels does occur, it is likely to be localised and occur for only a short duration, with collision avoidance action implemented by the vessels involved, in line with the COLREGs, thus ensuring that the situation does not develop into a collision incident. This is supported by experience at previous under construction wind farms, where no collision incidents involving two third-party vessels as a result of a wind farm have been reported, as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment.** Historical collision incident data also indicates that the most likely consequences will be low should a collision occur, with minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their respective passages and undertake a full inspection at the next port. As a worst-case, one of the vessels could be foundered resulting in a Potential Loss of Life (PLL) and / or pollution. If pollution were to occur in proximity to the OAA and Offshore ECC or involving a Salamander Project vessel, then the MPCP will be implemented to minimise the environmental risks.

14.11.1.12 Details of the Salamander Project will be promulgated in advance via all usual means, and the infrastructure will also be displayed on nautical charts. This will ensure vessels can passage plan in advance to minimise disruption and deviations, in turn minimising collision risk.

14.11.1.13 Severity of consequence occurrence in relation to third party to third party collision risk is considered **Serious**. The frequency of is considered **Negligible** given that deviations are anticipated to occur to a low number of vessels, and a serious collision is an even less frequent event based on the historical data studied in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Increased Vessel to Vessel Collision Risk Between a Third-party Vessel and a Salamander Project Vessel

14.11.1.14 The risk of encounters and collision risk associated with Salamander Project vessels involved in construction will be managed via marine coordination. This will include the application of traffic management procedures such as indicative transit routes between the OAA and the construction ports used, which will be set out in the VMP which will be a condition of consent. The implementation of the VMP was noted as an important mitigation during the hazard workshop. Salamander Project vessels will carry AIS and be compliant with Flag State regulations including IMO conventions such as the COLREGs. Further, an Offshore Fishing Liaison Officer will liaise with the local fishing industries to increase awareness of the Salamander Project vessels and activities.

14.11.1.15 An application for safety zones will also be made, which will include 500 m safety zones around any structures where construction work is ongoing (as indicated by the presence of a construction vessel). These safety zones will make it clear to any passing third party traffic the areas which should be avoided to minimise collision risk with the construction vessels, noting such vessels may be Restricted in Ability to Manoeuvre (RAM). The Salamander Project may also utilise and promulgate advisory safe passing distances around other ongoing works or vessels where identified as necessary via risk assessment (e.g. cable

installation). Details and locations of any safety zones and advisory safe passing distances will be promulgated including via the usual means.

14.11.1.16 Lighting and marking as required by NLB and MCA will be exhibited during the construction phase, which will further increase mariner awareness of the potential for ongoing sensitive operations when in proximity of the OAA, both in day and night conditions including in poor visibility.

14.11.1.17 Third-party vessels may experience restrictions on ability to visually identify Salamander Project vessels entering and exiting or within the OAA during reduced periods of visibility. However, this hazard will be mitigated by the application of the COLREGs (reduced speeds) in adverse weather conditions, noting that Salamander Project vessels will also carry AIS regardless of size.

14.11.1.18 Based on historical incident data (see NRA for further details), there has been one instance of a third-party vessel colliding with a wind farm vessel. In both incidents moderate vessel damage was reported with no harm to persons. It is noted that this occurred in 2011, and awareness of offshore wind developments and application of the measures outlined above has since improved and been refined considerably, with no further collision incidents reported since. In this regard it is noted that the nearby Hywind Scotland project means users of the area will be familiar with the presence of wind farm vessels.

14.11.1.19 Should an encounter occur between a third-party vessel and a Salamander Project vessel, it is likely to be localised and occur for only a short duration of time. With collision avoidance action implemented in line with the COLREGs, the vessels involved will likely be able to resume their respective passages and/or activities with no long-term consequences.

14.11.1.20 Should a collision occur, the most likely consequences will be similar to that outlined for the case of a collision between two third-party vessels above, namely minor contact between the vessels leading to minor damage and no injuries to persons, with both vessels able safely make their next port to undertake a full inspection. As a worst-case, one of the vessels could be foundered resulting in a PLL and pollution. If pollution were to occur in proximity to the OAA and Offshore ECC or involving a Salamander Project vessel, then the MPCP will be implemented to minimise the environmental risks.

14.11.1.21 The frequency of occurrence in relation to third party to Salamander Project vessel collision risk is considered **Negligible** noting the marine coordination and associated procedures that will be in place including the VMP. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Vessel to Structure Allision Risk

14.11.1.22 The spatial extent of impacts associated with vessel allision are considered small given that a vessel must be in close proximity to a structure in the OAA for an allision incident to occur. The forms of allision considered are:

- Powered allision risk;
- Drifting allision risk; and
- Internal allision risk.

Powered Allision

14.11.1.23 Quantitative powered allision assessment has been undertaken in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with the outputs estimating that a powered allision would occur once every 1,589 years. This value is reflective of the low levels of traffic anticipated to be routeing in proximity to the OAA as per the baseline vessel traffic data assessment and the anticipated routeing as set out in detail within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. It is noted that there have been no reported allision incidents to date associated with the nearby Hywind Scotland project, which is similar in scale and type to the Salamander Project.

14.11.1.24 Based on historical incident data, there have been two reported instances of a third-party vessel alliding with an operational wind farm structure in the UK (one in the Irish Sea and one in the Southern North Sea). Both of these incidents involved a fishing vessel.

14.11.1.25 The consequences of an allision will depend on multiple factors including the energy of the impact, structural integrity of the vessel (noting this will vary by vessel type and size), and sea state at the time of the impact. Fishing vessels and recreational vessels are considered most vulnerable to the impact given the potential for a non-steel construction and increased likelihood of internal navigation within the OAA by such vessels. In such cases, the most likely consequences will be minor damage with the vessel able to resume passage and undertake a full inspection at the next port (based on the incident data studied in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**). As a worst-case, the vessel could be foundered resulting in a PLL and pollution. If pollution were to occur, then the MPCP will be implemented to minimise the environmental risks.

14.11.1.26 Additionally, vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the Salamander Project including display of the structures on relevant nautical charts.

14.11.1.27 The structures (including when partially completed) and construction area as a whole will be lit and marked as directed by the MCA and NLB to ensure passing mariner awareness. There will also be 50 m pre-commissioning safety zones in place around foundations for the duration of the construction period, highlighting to mariners the allision risk. As noted in the Interaction with Wet Stored Subsea Infrastructure hazard text, once wet storage plans within the OAA are known, these will be discussed with the MCA and NLB to determine whether any additional mitigation is necessary.

Drifting Allision

14.11.1.28 Quantitative drifting allision assessment has been undertaken in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with the outputs estimating that a drifting allision would occur once every 46,451 years. This is comparatively low when compared against the estimated allision frequencies of other UK offshore wind farm (OWF) developments and is reflective of the low levels of traffic anticipated to be routeing in proximity to the OAA as per the baseline vessel traffic survey data assessment and the anticipated post wind farm routeing as set out in detail within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**.

14.11.1.29 Based on historical incident data, there have been no instances of a third-party vessel alliding with a UK operational wind farm structure whilst Not Under Command (NUC). It is also noted that this includes the nearby Hywind Scotland project, which is similar in scale and type to the Salamander Project.

14.11.1.30 A vessel adrift scenario may only develop into an allision situation if in proximity to a structure within the OAA. This would only be the case where the vessel was either located internally within or in close proximity to the OAA, and the direction of the wind and/or tide is towards a structure. In the event that a vessel starts

to drift towards the OAA, the vessel will first initiate its own procedures for such an event, which may involve dropping anchor depending on water depths or the use of thrusters (depending on availability and power supply). This may include an emergency anchoring event which would involve checking relevant nautical charts to ensure that deployment of the anchor will not lead to other risks (such as anchor snagging on a subsea cable) in line with emergency procedures.

14.11.1.31 Further, any project vessels on site associated with the construction of the Salamander Project may be able to provide assistance in liaison with MCA and as required under SOLAS obligations (IMO, 1974). This would depend on the size of both the adrift vessel and the Salamander Project vessel(s).

14.11.1.32 Should a drifting allision occur, the consequences will be similar to those noted for the case of a powered allision, including the worst-case of foundering and pollution. In the highly unlikely scenario of a drifting allision incident resulting in pollution, the implementation of the MPCP will minimise the environmental risk. Additionally, a drifting vessel is likely to transit at a reduced speed compared to a powered vessel dependent on conditions, thus reducing the energy of the impact.

Internal Allision

14.11.1.33 Internal allision refers to incidents where vessels allide with structures within the array area. It is likely that only smaller vessels (e.g. fishing, recreation) will transit through the OAA, noting this may be less likely during the construction phase. On this basis it is considered unlikely that a commercial vessel would be involved in an internal allision (noting that regular operators of the area indicated they would deviate to avoid the OAA as per **Section 14.4**).

14.11.1.34 Based on modelling of allision risk to fishing vessels in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, the base case annual fishing vessel to structure internal allision frequency is estimated to be 8.25×10^{-2}, corresponding to a return period of approximately one in 12 years. This is a relatively high return period, however as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment** it is important to note that this is based on a worst-case conservative assumption that baseline activity will remain unchanged once the structures are in place i.e., no account is made for fishing vessels choosing to pass further from the structures or choosing to avoid the OAA altogether. In this regard it is noted that input received during the hazard workshop was that fishing vessels are likely to avoid the OAA, with the ongoing construction works likely to mean access is less likely than during the O&M phase.

14.11.1.35 Any vessel navigating within the OAA is expected to passage plan in accordance with SOLAS Chapter V (IMO, 1974) and promulgation of information via the usual means will ensure that such vessels have good awareness of the Salamander Project.

14.11.1.36 The structures (including when partially completed) and construction area as a whole will be lit and marked as directed by the MCA and NLB to ensure passing mariner awareness. There will also be 50 m pre-commissioning safety zones in place around foundations for the duration of the construction period, highlighting to mariners the allision risk.

14.11.1.37 For recreational vessels with a mast there is an additional allision risk when navigating internally associated with the turbine blades. However, the minimum blade tip clearance is 22 m which is aligned with the minimum clearance the RYA recommend for minimising allision risk (RYA, 2019).

Significance

14.11.1.38 The frequency of occurrence is considered **Remote**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Tolerable** and ALARP with the embedded mitigations in place including lighting and marking, charting, and promulgation of information, and therefore **Not Significant** in EIA terms.

Reduced Access to Local Ports

14.11.1.39 The key port in the area is considered to be Peterhead, with the Offshore ECC making landfall approximately 2 nm to the north of the port entrance, meaning it passes clear of the port limits and charted pilotage area. On this basis the installation works are unlikely to notably impact port access, with any impact being temporary and limited spatially.

14.11.1.40 There is considered to be no impact from the OAA on port access given it is located 18 nm from shore.

14.11.1.41 Marine coordination and vessel procedures will be in place to manage Salamander Project vessel movements and minimise disruption to third-party vessels whilst entering or exiting port. As such, no notable impact on port access is expected from Salamander Project vessels, noting any interactions with third party vessels would be managed via COLREGs in addition to the marine coordination procedures including the VMP. All relevant port rules and procedures will also be followed by Salamander Project vessels using any selected ports, as set out by those ports.

14.11.1.42 The frequency of occurrence is considered **Extremely Unlikely** given Salamander Project vessel movements will be managed via marine coordination and VMP. Severity of consequence is considered **Minor**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Interaction with Wet Stored Subsea Infrastructure

14.11.1.43 During construction, it is intended that mooring lines and subsea cables will be wet stored within the OAA, and may not be entirely on the seabed and include sections in the water column. It is considered unlikely that the mooring lines and cables would be near enough to the surface to risk any vessel interaction during this period noting water depths in excess of 80 m, however precise design requirements for wet storge are not yet known. Therefore, once designs are finalised, the need for any mitigation will be discussed and agreed with MCA and NLB.

14.11.1.44 It is anticipated that the OAA will be marked as a buoyed construction area (noting that this would be directed by NLB), and that the mooring lines and dynamic cables will be within the OAA including while wet stored.

14.11.1.45 The frequency of occurrence is considered **Extremely Unlikely**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Tolerable**.

14.11.1.46 Assuming the confirmation of any required mitigation in agreement with MCA and NLB once design requirements are known, the hazard is considered **Tolerable with Mitigation** and ALARP (noting the embedded mitigation in place notably the buoyed construction area), and therefore **Not Significant** in EIA terms.

Reduction of Emergency Response Capability

14.11.1.47 The construction of the Salamander Project will lead to an increased level of vessels and personnel in the area over baseline levels. On this basis there may be an increase in the number of incidents requiring emergency response over baseline rates.

14.11.1.48 Baseline incident rates are considered low in the area based on the data studied, with an average of less than one per year indicated within the MAIB, RNLI and helicopter taskings datasets. It is also noted that to date, there have only been 13 reported allision incidents associated with OWFs in the UK (as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**). While it should be considered that this only covers allisions, it is still not anticipated that the Salamander Project would notably increase the observed baseline incident rates which are already low.

14.11.1.49 Further, the on-site vessels and resources associated with the construction of the Salamander Project will form additional resource to respond to any incidents in the area in liaison with the MCA, both in terms of incidents associated with the Salamander Project (i.e. self help resources), but also incidents occurring in the general area to third party vessels. As required under MGN 654 (MCA, 2021), the Applicant will produce and submit an ERCoP specific to the construction phase to the MCA detailing how they would cooperate and assist in the event of an incident including consideration of the resources associated with the Salamander Project.

14.11.1.50 The frequency of occurrence is considered **Extremely Unlikely** noting the limited anticipated effect on incidents rates and presence of Salamander Project vessels. Severity of consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.11.2 Operation and Maintenance

14.11.2.1 Under the operation and maintenance phase the following potential impacts have been assessed:

- Vessel displacement;
- Increased vessel to vessel collision risk between third-party vessels;
- Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel;
- Vessel to structure allision risk;
- Reduced access to local ports;
- Reduction of under keel clearance from cable protection;
- Interaction with subsea infrastructure;
- Loss of station;
- Anchor Interaction with subsea cables; and
- Reduction of emergency response capability.

Vessel Displacement

14.11.2.2 As per **Section 14.11.1**, it is anticipated that commercial vessels will deviate during the construction phase and it is considered likely that these pre-established deviations would remain during the operational phase. This aligns with both operational experience of other UK wind farms, and the consultation input received

from regular operators of the area (see **Section 14.4**). It is noted that there would be no formal restrictions on entry into the OAA other than through any active safety zones, however operational experience indicates commercial vessels will still avoid the structures.

14.11.2.3 A total of 16 vessel routes were identified within the main routeing analysis in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, five of which were anticipated to deviate to avoid the OAA. The maximum deviation was 0.8 nm, to Route 13, used by less than a vessel a day on average. All other deviations were less than 0.3 nm (and again were to routes used by less than a vessel a day on average). This aligns with input received from commercial vessel operators who use the local area, which indicated any deviations would be minor (see **Section 14.4**).

14.11.2.4 Smaller vessel types (e.g. fishing vessels and recreational vessels) may still choose to transit through the OAA during the operational phase, noting that this would be at the discretion of the individual vessels. In this regard, it should be considered that there is limited experience in the deployment of floating projects and on this basis it is considered that smaller vessels may be less likely to transit between floating structures than those on fixed foundations. This aligns with the vessel traffic data collected which shows that vessels tended to avoid the operational Hywind Scotland site to the south (other than vessels associated with Hywind Scotland itself i.e. O&M vessels), noting that Hywind Scotland is similar to the Salamander Project in that both are small scale floating projects. Regardless, the final layout will be agreed with the MCA and NLB post-consent, and these discussions will include consideration of surface navigation both for passing traffic and internal navigation.

14.11.2.5 There may be some displacement resulting from maintenance activities within the Offshore ECC however any such displacement would be temporary and spatially limited to the area around the operation, and there is searoom to accommodate any such minor deviations.

14.11.2.6 The main consequence of vessel displacement will be increased journey times and distances for the deviated vessels. However, as above, deviations are expected to be minor and third-party commercial vessels are considered likely to utilise routes that were established during the construction phase. Vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage-plan in advance given the promulgation of information relating to the Salamander Project and display of infrastructure on relevant nautical charts, meaning any disruption can be minimised. Furthermore, vessels will likely be more familiar with the Salamander Project during the operational phase compared to the construction phase.

14.11.2.7 No specific concerns were raised in consultation regarding adverse weather routeing in the consultation process. It is likely that vessels will be more likely to avoid the OAA during adverse conditions, however there is room to accommodate the minor deviations that would be required.

14.11.2.8 The frequency of occurrence in relation to vessel traffic displacement is considered **Remote**, given that deviations will have already been established during the construction phase with a low number of vessels impacted by the transition to operational phase. The severity of consequence is considered **Negligible**, given that any deviations will be minor and can be safely accommodated. On this basis, the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms**.**

Increased Vessel to Vessel Collision Risk Between Third-party Vessels

14.11.2.9 As discussed in the Vessel Displacement impact text above, any deviations and displacement of third party traffic is anticipated to be minor, both in terms of the number of vessels affected and also the magnitude of the deviations, with these deviations likely to be well established in the O&M phase. It is therefore considered unlikely that there will be a large increase in encounters and collision risk, noting that there is

considered to be searoom to safely accommodate any displaced vessels. This aligns with the collision modelling undertaken within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, which estimated that post wind farm a vessel would be involved in a collision once per 1,147 years, representing an increase of only 3% from the pre wind farm scenario. It also aligns with input received from vessel operators (see **Section 14.4**) which indicated limited concerns with the minor deviations required to avoid the OAA.

14.11.2.10 In addition to larger vessels, smaller vessels may also choose to avoid the OAA which could lead to increased encounters with other larger commercial vessels. However, given the searoom available, and noting any such encounters would be managed via COLREGs and SOLAS, it is considered unlikely that this would lead to any notable increase in collision risk between small vessels and larger commercial vessels.

14.11.2.11 In the event that an encounter between vessels does occur, it is likely to be localised and occur for only a short duration, with collision avoidance action implemented by the vessels involved, in line with the COLREGs, thus ensuring that the situation does not develop into a collision incident. This is supported by experience at previous under construction wind farms, where no collision incidents involving two third-party vessels have been reported, as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. Historical collision incident data also indicates that the most likely consequences will be low should a collision occur, with minor contact between the vessels resulting in minor damage and no injuries to persons, with both vessels able to resume their respective passages and undertake a full inspection at the next port. As a worst-case, one of the vessels could be foundered resulting in a PLL and / or pollution. If pollution were to occur in proximity to the OAA and Offshore ECC or involving a Salamander Project vessel, then the MPCP will be implemented to minimise the environmental risks.

14.11.2.12 Details of the Salamander Project will be promulgated in advance via all usual means, and the infrastructure will also be displayed on nautical charts. This will ensure vessels can passage plan in advance to minimise disruption and deviations, in turn minimising collision risk.

14.11.2.13 Severity of consequence occurrence in relation to third party to third party collision risk is considered **Serious**. The frequency of is considered **Negligible** given that deviations are anticipated to occur to a low number of vessels, and a serious collision is an even less frequent event based on the historical data studied in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Increased Vessel to Vessel Collision Risk Between a Third-party Vessel and a Salamander Project Vessel

14.11.2.14 The risk of encounters and collision risk associated with Salamander Project vessels during the O&M phase will be managed via marine coordination, similarly to the construction phase. This will include the application of traffic management procedures such as indicative transit routes between the OAA and the base ports used, which will be set out in the VMP which will be a condition of consent. The implementation of the VMP was noted as an important mitigation during the hazard workshop. Salamander Project vessels will carry AIS and be compliant with Flag State regulations including IMO conventions such as the COLREGs.

14.11.2.15 An application for safety zones will also be made, which will include 500 m safety zones around any structures where major maintenance is ongoing. These safety zones will make it clear to any passing third party traffic the areas which should be avoided to minimise collision risk with the Salamander Project vessels, noting such vessels may be RAM. The Salamander Project may also utilise and promulgate advisory safe passing distances around other ongoing works or vessels where identified as necessary via risk assessment

(e.g. cable maintenance). Details and locations of any safety zones and advisory safe passing distances will be promulgated via the usual means.

14.11.2.16 Lighting and marking as required by NLB and MCA will be exhibited during the O&M phase, which will further increase mariner awareness of the potential for any ongoing sensitive maintenance operations when in proximity of the OAA, both in day and night conditions including in poor visibility.

14.11.2.17 Third-party vessels may experience restrictions on ability to visually identify Salamander Project vessels entering and exiting or within the OAA during reduced periods of visibility. However, this hazard will be mitigated by the application of the COLREGs (reduced speeds) in adverse weather conditions, noting that Salamander Project vessels will also carry AIS regardless of size.

14.11.2.18 Based on historical incident data (see NRA for further details), there has been one instance of a collision involving a wind farm vessel within a harbour. Moderate vessel damage was reported with no harm to persons. It is noted that this incident occurred in 2011, and awareness of offshore wind developments and application of the measures outlined above has since improved and been refined considerably, with no further collision incidents reported since involving a third-party vessel.

14.11.2.19 Should an encounter occur between a third-party vessel and a Salamander Project vessel, it is likely to be localised and occur for only a short duration of time. With collision avoidance action implemented in line with the COLREGs, the vessels involved will likely be able to resume their respective passages and/or activities with no long-term consequences. It is noted that Salamander Project vessel numbers are anticipated to be lower during the O&M phase than during construction (up to 12 vessels total compared to up to 40 vessels total), and as such frequency of encounters is also likely to be lower.

14.11.2.20 Should a collision occur, the most likely consequences will be similar to that outlined for the case of a collision between two third-party vessels above, namely minor contact between the vessels leading to minor damage and no injuries to persons, with both vessels able safely make their next port to undertake a full inspection. As a worst-case, one of the vessels could be foundered resulting in a PLL and pollution. If pollution were to occur in proximity to the OAA and Offshore ECC or involving a Salamander Project vessel, then the MPCP will be implemented to minimise the environmental risks.

14.11.2.21 The frequency of occurrence in relation to third party to Salamander Project vessel collision risk is considered **Negligible** noting the marine coordination and associated procedures that will be in place including the VMP. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Vessel to Structure Allision Risk

14.11.2.22 The spatial extent of impacts associated with vessel allision are considered small given that a vessel must be in close proximity to a structure in the OAA for an allision incident to occur. The forms of allision considered are:

- Powered allision risk;
- drifting allision risk; and
- Internal allision risk.

Powered Allision

14.11.2.23 Quantitative powered allision assessment has been undertaken in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with the outputs estimating that a powered allision would occur once every 1,589 years.

This value is reflective of the low levels of traffic anticipated to be routeing in proximity to the OAA as per the baseline vessel traffic data assessment and the anticipated post wind farm routeing as set out in detail within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment.** It is noted that there have been no reported allision incidents to date associated with the nearby Hywind Scotland project, which is similar in scale and type to the Salamander Project.

14.11.2.24 Based on historical incident data, there have been two reported instances of a third-party vessel alliding with an operational wind farm structure in the UK (one in the Irish Sea and one in the Southern North Sea). Both of these incidents involved a fishing vessel.

14.11.2.25 The consequences of an allision will depend on multiple factors including the energy of the impact, structural integrity of the vessel (noting this will vary by vessel type and size), and sea state at the time of the impact. Fishing vessels and recreational vessels are considered most vulnerable to the impact given the potential for a non-steel construction and increased likelihood of internal navigation within the OAA by such vessels. In such cases, the most likely consequences will be minor damage with the vessel able to resume passage and undertake a full inspection at the next port (based on the incident data studied in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**). As a worst-case, the vessel could be foundered resulting in a PLL and pollution. If pollution were to occur, then the MPCP will be implemented to minimise the environmental risks.

14.11.2.26 Additionally, vessels are expected to comply with international and flag state regulations (including the COLREGs and SOLAS) and will be able to passage plan in advance given the promulgation of information relating to the Salamander Project including display of the structures on relevant nautical charts.

14.11.2.27 The structures will also be lit and marked as directed by the MCA and NLB to ensure passing mariner awareness (e.g. lights, sound signals). NLB indicated during the hazard workshop that NLB may require all WTGs to have marine lights installed, meaning if a WTG was towed away for maintenance, the lighting and marking would remain complete. Precise requirements will be agreed via the LMP process post-consent.

Drifting Allision

14.11.2.28 Quantitative drifting allision assessment has been undertaken in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with the outputs estimating that a drifting allision would occur once every 46,451 years. This is comparatively low when compared against the estimated allision frequencies of other UK OWF developments and is reflective of the low levels of traffic anticipated to be routeing in proximity to the OAA as per the baseline vessel traffic survey data assessment and the anticipated post wind farm routeing as set out in detail within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**.

14.11.2.29 Based on historical incident data, there have been no instances of a third-party vessel alliding with a UK operational wind farm structure whilst NUC. It is also noted that this includes the nearby Hywind Scotland project, which is similar in scale and type to the Salamander Project.

14.11.2.30 A vessel adrift scenario may only develop into an allision situation if in proximity to a structure within the OAA. This would only be the case where the vessel was either located internally within or in close proximity to the OAA, and the direction of the wind and/or tide is towards a structure. In the event that a vessel starts to drift towards the OAA, the vessel will first initiate its own procedures for such an event, which may involve dropping anchor depending on water depths or the use of thrusters (depending on availability and power supply). This may include an emergency anchoring event which would involve checking relevant nautical

charts to ensure that deployment of the anchor will not lead to other risks (such as anchor snagging on a subsea cable) in line with emergency procedures.

14.11.2.31 Further, any Salamander Project vessels on site may be able to provide assistance in liaison with MCA and as required under SOLAS obligations (IMO, 1974). This would depend on the size of both the adrift vessel and the Salamander Project vessel(s).

14.11.2.32 Should a drifting allision occur, the consequences will be similar to those noted for the case of a powered allision, including the worst-case of foundering and pollution. In the highly unlikely scenario of a drifting allision incident resulting in pollution, the implementation of the MPCP will minimise the environmental risk. Additionally, a drifting vessel is likely to transit at a reduced speed compared to a powered vessel dependent on conditions, thus reducing the energy of the impact.

Internal Allision

14.11.2.33 It is likely that only smaller vessels (e.g. fishing, recreation) will transit through the OAA, as discussed in **Section 14.11.1**. On this basis it is considered unlikely that a commercial vessel would be involved in an internal allision (noting that regular operators of the area indicated they would deviate to avoid the OAA as per **Section 14.4**).

14.11.2.34 Based on the modelling of allision risk to fishing vessels in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, the base case annual fishing vessel to structure internal allision frequency is estimated to be 8.25×10^{-2}, corresponding to a return period of approximately one in 12 years. This is a relatively high return period, however as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment** it is important to note that this is based on a worst-case conservative assumption that baseline activity will remain unchanged once the structures are in place i.e., no account is made for fishing vessels choosing to pass further from the structures or choosing to avoid the OAA altogether. In this regard it is noted that input received during the hazard workshop was that fishing vessels are likely to avoid the OAA.

14.11.2.35 The final layout will be agreed with both NLB and MCA, noting these discussions will include consideration of ensuring safe internal navigation.

14.11.2.36 Any vessel navigating within the OAA is expected to passage plan in accordance with SOLAS Chapter V (IMO, 1974) and promulgation of information via the usual means will ensure that such vessels have good awareness of the Salamander Project.

14.11.2.37 The Applicant will exhibit lights, marks, sounds, signals and other aids to navigation as required by NLB and MCA. This will include unique identification marking of each structure in an easily understandable pattern to minimise the risk of a mariner navigating internally becoming disoriented, noting the ID system will be agreed with the MCA.

14.11.2.38 Should a recreational vessel under sail enter the proximity of a WTG within the OAA, there is also potential for effects such as wind shear, masking and turbulence to occur (noting that recreational vessels may be less likely to come into proximity of floating WTGs than fixed). From previous studies of offshore wind developments, it has been concluded that WTGs do reduce wind velocity downwind of a WTG (MCA, 2008) but that no negative effects on recreational craft have been reported on the basis of the limited spatial extent of the effect and its similarity to that experienced when passing a large vessel or close to other large structures (such as bridges) or the coastline. In addition, no practical issues have been raised by recreational users to date when operating in proximity to existing offshore wind developments. For recreational vessels with a mast there is an additional allision risk when navigating internally associated with the WTG blades.

However, the minimum blade tip clearance is 22 m which is aligned with the minimum clearance the RYA recommend for allision risk (RYA, 2019).

Significance

14.11.2.39 The frequency of occurrence is considered **Remote**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Tolerable** and ALARP with the embedded mitigations in place including lighting and marking, charting, and promulgation of information, and therefore **Not Significant** in EIA terms.

Reduced Access to Local Ports

14.11.2.40 The key port in the area is considered to be Peterhead, with the Offshore ECC making landfall approximately 2 nm to the north of the port entrance, meaning it passes clear of the port limits and charted pilotage area. On this basis any maintenance works are unlikely to notably impact port access, with any impact being temporary and limited spatially. There will be no impact from the cables once they are installed.

14.11.2.41 There is considered to be no impact from the OAA on port access given it is located 18 nm from shore.

14.11.2.42 Marine coordination and vessel procedures will be in place to manage Salamander Project vessel movements and minimise disruption to third-party vessels whilst entering or exiting any port used. As such, no notable impact on port access is expected from Salamander Project vessels, noting any interactions with third party vessels would be managed via COLREGs in addition to the marine coordination procedures including the VMP. All relevant port rules and procedures will also be followed by Salamander Project vessels using any selected ports, as set out by those ports.

14.11.2.43 It is also noted that Salamander Project vessel numbers during the O&M phase are anticipated to be lower than during the construction phase (up to 12 vessels total compared to up to 40 vessels total).

14.11.2.44 The frequency of occurrence is considered **Extremely Unlikely** given Salamander Project vessel movements will be managed via marine coordination and VMP. Severity of consequence is considered **Minor**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Reduction of Under Keel Clearance from Cable Protection

14.11.2.45 Where suitable burial as defined by the cable burial risk assessment is not possible, external remedial protection may be utilised, with this protection potentially being up to 1.5 m in height. This could lead to a reduction of navigable depths, leading to a potential for underkeel interaction.

14.11.2.46 In line with MGN 654, where any depth reduction exceeded 5%, the Applicant will undertake further assessment and consult with the MCA to determine whether any additional mitigation is required to ensure safety of navigation. The key areas of risk are likely to be in areas where water depths are shallow i.e. the coastal / nearshore areas where only smaller vessels would be expected to transit. Input received at the

Hazard Workshop was that concern over underkeel risk to recreational vessels was limited given the provisions of MGN 654.

14.11.2.47 Should an underwater allision occur, minor damage incurred is the most likely consequence, and foundering of the vessel resulting in a PLL and pollution the worst-case consequences.

14.11.2.48 The frequency of occurrence is considered **Extremely Unlikely**. Severity of consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Interaction with Subsea Infrastructure

14.11.2.49 Vessels navigating in proximity to the floating foundations within the OAA may be at risk of interaction with either the mooring lines, or any underwater elements of the floating substructures not visible from the surface including the dynamic subsea cables. The level of risk will depend on the clearance available above subsea elements (in particular the mooring lines and dynamic cables).

14.11.2.50 There will be up to eight mooring lines per floating substructure used to secure them to the seabed, with a mooring line radius of up to 1,500 m. The highest risk areas in terms of potential underkeel clearance interaction will be the areas in the immediate vicinity of the floating substructures where the mooring lines are closest to the surface. The same applies for the dynamic cables, noting the use of buoyancy modules means the dynamic cables will descend away from the foundations but then re-ascend towards the surface before descending again to the seabed.

14.11.2.51 It is considered likely that larger commercial vessels will not enter into the OAA based on operational experience of other UK OWFs including the nearby Hywind Scotland, and the input received from vessel operators during the consultation process. On this basis, taking into consideration the baseline and anticipated post wind farm vessel routeing, it is considered unlikely that a commercial vessel would pass in close proximity to the floating foundations and hence be at risk of subsea interaction.

14.11.2.52 Therefore, it is likely that any vessels in proximity to the substructures will be small (e.g. fishing, recreation), noting that such vessels will typically have much smaller draughts than larger commercial vessels. Based on the vessel traffic data collected, average fishing vessel draught within the OAA was 4.1 m, with the maximum being 5.2 m. Input received at the hazard workshop was that an underwater clearance of 10 m would likely alleviate the risk to fishing vessels, noting that the vessel traffic data shows fishing vessels avoided the nearby Hywind Scotland site. The confirmed available clearance should be discussed with the MCA and NLB post installation to determine if any additional mitigation is required.

14.11.2.53 It is considered likely that any vessels choosing to pass in close proximity to the floating foundations will be transiting with caution noting that the relevant infrastructure will be charted, and promulgation of information will be undertaken.

14.11.2.54 There is limited experience of deployment of large scale floating offshore wind projects in UK waters, however it is noted that the nearby Hywind Scotland and Kincardine Offshore Wind Farm floating projects are both located off the eastern Scottish Coast, in relative proximity to the OAA. To date there have been no

reported underkeel interactions between passing vessels and the components associated with these projects.

14.11.2.55 There is not considered to be a risk of underkeel interaction with the subsea hubs given the water depths being in excess of 80 m within the OAA relative to the height of the subsea hubs (up to 10 m). Stakeholders confirmed limited concern during consultation.

14.11.2.56 Details of the infrastructure including the WTGs / floating substructures, mooring lines, and subsea cables will be promulgated to maximise awareness of the Salamander Project and any potential underkeel interaction risk. The locations of the WTGs / floating substructures would be clearly shown on appropriate nautical charts, and the Applicant will also provide the locations of the anchors and mooring lines to the UKHO for charting purposes.

14.11.2.57 The frequency of occurrence is considered **Extremely Unlikely**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be tolerable.

14.11.2.58 Assuming the confirmation of available underkeel clearance in agreement with MCA and NLB post installation, the hazard is considered **Tolerable with Mitigation** and ALARP noting the embedded mitigation in place including charting of the infrastructure, and therefore **Not Significant** in EIA terms.

Loss of Station

14.11.2.59 Loss of station refers to an instance where a structure breaks free from its moorings. MCA require under their Regulatory Expectations on Moorings for Floating Wind and Marine Devices (MCA & HSE, 2017) that developers arrange Third Party Verification (TPV) of the mooring systems by an independent and competent person / body. The Regulatory Expectations state that TPV is a "continuous activity", and that if any modifications to a system occur or if new information becomes available with regard to its reliability, additional TPV would be required.

14.11.2.60 A loss of station is therefore considered likely to represent a low frequency event, noting that for a total loss of station, all moorings would be required to fail.

14.11.2.61 The Regulatory Expectations also require the provision of continuous monitoring either by Global Positioning System (GPS) or other suitable means, The Applicant will put such a system in place, with each WTG continuously monitored, and with capability of being tracked in the event of a loss of station as detailed in MGN 654.

14.11.2.62 The frequency of occurrence in relation to the risk of loss of station is considered **Negligible** noting the TPV and associated requirements under the MCA regulatory expectations. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Anchor Interaction with Subsea Cables

14.11.2.63 No vessels at anchor were identified within the vessel traffic data studied within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, and the nearest anchoring area identified was a reported anchorage location 8 nm south of the Offshore ECCs landfall, within the Cruden Bay. Further, no concerns around proximity to known or preferred anchoring areas have been raised during consultation.

14.11.2.64 In line with SOLAS (IMO, 1974), the charted location of any hazards should be taken into consideration by vessels as part of the decision-making process over where to anchor. The locations of subsea cables,

structure locations and mooring lines will be provided to the UKHO for charting purposes, and as such mariners will be able to include the locations of this infrastructure within their decision-making processes.

14.11.2.65 In the event that an interaction incident occurs between a vessel anchor and the cables, the most likely consequences will be low based on historical anchor interaction incidents, with no damage incurred to the cable or the vessel. As a worst-case, a snagging incident could occur and/or the vessel's anchor and the cable could be damaged. For fishing vessels or recreational vessels, the consequences may also include compromised stability of the vessel.

14.11.2.66 The cables would be protected via either burial or remedial external protection, noting this will be assessed and defined as part of the cable burial risk assessment process which will consider baseline traffic patterns over the cables, and ensure protection is suitable for the expected vessel types, sizes and numbers in the area.

14.11.2.67 It is noted that there will be dynamic sections of cables and mooring lines between the seabed and the floating foundations. However, anchor interaction with these sections is considered an unlikely event given water depths and the presence of infrastructure means anchoring is unlikely to be attempted in the vicinity of the OAA.

14.11.2.68 The frequency of occurrence in relation to the risk of anchor interaction is considered **Extremely Unlikely** given baseline anchoring is low and the cable burial risk assessment process will be in place to ensure the cables are protected. Severity of consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Reduction of Emergency Response Capability

14.11.2.69 The operation of the Salamander Project will lead to an increased level of vessels and personnel in the area over baseline levels. On this basis there may be an increase in the number of incidents requiring emergency response over baseline rates.

14.11.2.70 Baseline incident rates are considered low in the area based on the data studied, with an average of less than one per year indicated within the MAIB, RNLI and helicopter taskings datasets. It is also noted that to date, there have only been 13 reported allision incidents associated with OWFs in the UK (as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**). While it should be considered that this only covers allisions, it is still not anticipated that the Salamander Project would notably increase the observed baseline incident rates which are already low.

14.11.2.71 Further, the on-site vessels and resources associated with the Salamander Project will form additional resource to respond to any incidents in the area in liaison with the MCA, both in terms of incidents associated with the Salamander Project (i.e. self help resources), but also incidents occurring in the general area to third party vessels. As required under MGN 654, the Applicant will produce and submit an ERCoP to the MCA detailing how they would cooperate and assist in the event of an incident including consideration of the resources associated with the Salamander Project.

14.11.2.72 In terms of SAR access, the final layout will be agreed with the MCA post-consent and will comply with the requirements of MGN 654 ensuring suitable SAR access is maintained. It is noted that the scale of the Salamander Project (up to seven WTGs only) means the spatial area covered is low.

14.11.2.73 The frequency of occurrence is considered **Extremely Unlikely** noting the limited anticipated effect on incidents rates and MGN 654 compliance including in relation to layout design and SAR access. Severity of

consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.11.3 Decommissioning

14.11.3.1 Under the decommissioning phase the following potential impacts have been assessed:

- Vessel displacement;
- Increased vessel to vessel collision risk between third-party vessels;
- Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel;
- Vessel to structure allision risk;
- Reduced access to local ports; and
- Reduction of emergency response capability.

Vessel Displacement

14.11.3.2 Given construction and decommissioning are likely to represent similar scenarios, it is likely that this hazard will be similar in nature to the equivalent construction phase hazard i.e. similar deviations to those established during the construction phase.

14.11.3.3 On this basis the frequency of occurrence in relation to displacement of vessel traffic is considered **Reasonably Probable** given that minor deviations are anticipated to occur to a small number of vessels. Severity of consequence is considered **Negligible** given any deviations will be minor and can be safely accommodated. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Increased Vessel to Vessel Collision Risk Between Third-party Vessels

14.11.3.4 Given construction and decommissioning are likely to represent similar scenarios, it is likely that this hazard will be similar in nature to the equivalent construction phase hazard i.e. similar deviations to those established during the construction phase leading to similar collision risk.

14.11.3.5 On this basis, the frequency of occurrence in relation to third party to third party collision risk is considered **Negligible** given that deviations are anticipated to occur to a low number of vessels. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Increased Vessel to Vessel Collision Risk Between a Third-party Vessel and a Salamander Project Vessel

14.11.3.6 Given construction and decommissioning are likely to represent similar scenarios (in particular increased Salamander Project vessel presence), it is likely that this hazard will be similar in nature to the equivalent construction phase hazard.

14.11.3.7 On this basis the frequency of occurrence in relation to third party to Salamander Project vessel collision risk is considered **Negligible**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Vessel to Structure Allision Risk

14.11.3.8 Given construction and decommissioning are likely to represent similar scenarios (in particular increased Salamander Project vessel presence, and potential for partial infrastructure), it is likely that this hazard will be similar in nature to the equivalent construction phase hazard.

14.11.3.9 The frequency of occurrence is considered **Remote**. Severity of consequence is considered **Serious**. On this basis the significance of risk is assessed to be **Tolerable** and ALARP, and therefore **Not Significant** in EIA terms.

Reduced Access to Local Ports

14.11.3.10 Given construction and decommissioning are likely to represent similar scenarios (in particular increased Salamander Project vessel presence including to and from base ports), it is likely that this hazard will be similar in nature to the equivalent construction phase hazard. It is noted that local vessels will likely be more familiar with the presence of wind farm traffic during decommissioning than was the case during construction.

14.11.3.11 On this basis, the frequency of occurrence is considered **Extremely Unlikely** given Salamander Project vessel movements will be managed via marine coordination. Severity of consequence is considered **Minor**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

Reduction of Emergency Response Capability

14.11.3.12 Given construction and decommissioning are likely to represent similar scenarios (in particular increased Salamander Project vessel and personnel presence), it is likely that this hazard will be similar in nature to the equivalent construction phase hazard.

14.11.3.13 The frequency of occurrence is considered **Extremely Unlikely** noting the limited anticipated effect on incidents rates and presence of Salamander Project vessels. Severity of consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.11.4 Summary of Impact Assessment

14.11.4.1 A summary of the impacts and effects identified for the Shipping and Navigation assessment is outlined in **Table 14-12.**

Table 14-12 Summary of impacts and effects for Shipping and Navigation

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
Construction									
Vessel Displacement	OAA and Offshore ECC	Co11, Co34 and Co53	All Vessels	Reasonably Probable	Negligible	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Increased vessel to vessel collision risk between third-party vessels	OAA and Offshore ECC	Co11, Co31, Co33, Co34, Co53 and Co9	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Increased vessel to vessel collision risk between a	OAA and Offshore ECC	Co24, Co11, Co36, Co31,	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the	Broadly Acceptable	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
third-party vessel and a Salamander Project vessel		Co33, Co34, Co53 and Co9					embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant		
Vessel to structure allision risk	OAA	Co53, Co24, Co11, Co36, Co31, Co33, Co34, Co53, Co9 and Co18	All Vessels	Remote	Serious	Tolerable and ALARP	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Tolerable and ALARP	Not Significant
Reduced access to local ports	OAA and Offshore ECC	Co11 and Co18	Vessels and Port Services	Extremely unlikely	Minor	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Interaction with wet	OAA	Co36, Co34, Co18	All Vessels	Extremely Unlikely	Serious	Tolerable	Consultation with MCA and NLB on any necessary mitigations once wet	Tolerable and ALARP	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
stored subsea infrastructure							storage design requirements are known.		
Reduction of emergency response capability	OAA and Offshore ECC	Co11, Co36, Co31, Co33, Co53, Co9 and Co18	Emergency Response Resources	Extremely unlikely	Moderate	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Operation and Maintenance									
Vessel Displacement	OAA and Offshore ECC	Co11, Co34 and Co53	All Vessels	Remote	Negligible	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
Increased vessel to vessel collision risk between third-party vessels	OAA and Offshore ECC	Co11, Co31, Co33, Co34, Co53 and Co10	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Increased vessel to vessel collision risk between a third-party vessel and a Salamander Project vessel	OAA and Offshore ECC	Co24, Co11, Co36, Co31, Co33, Co34, Co53 and Co10	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Vessel to structure allision risk	OAA	Co35, Co24, Co11, Co36, Co31, Co33, Co34, Co53, Co10 and Co18	All Vessels	Remote	Serious	Tolerable and ALARP	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it	Tolerable and ALARP	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
							was concluded that the effect was Not Significant		
Reduced access to local ports	OAA and Offshore ECC	Co11 and Co18	Vessels and Port Services	Extremely Unlikely	Minor	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Reduction of under keel clearance from cable protection	OAA and Offshore ECC	Co14, Co30, Co34, Co18 and Co45	All Vessels	Extremely Unlikely	Moderate	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Interaction with subsea infrastructure	OAA	Co30, Co34, Co53, Co18 and Co45	All Vessels	Extremely Unlikely	Serious	Tolerable	Consultation with MCA and NLB on clearance depths	Tolerable and ALARP	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
Loss of station	OAA	Co31, Co33 and Co18	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Anchor interaction with subsea cables	OAA and Offshore ECC	Co14, Co30, Co34, Co18 and Co45	Anchored Vessels	Extremely Unlikely	Moderate	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Reduction of emergency response capability	OAA and Offshore ECC	Co11 and Co36	Emergency Response Resources	Extremely unlikely	Moderate	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it	Broadly Acceptable	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
							was concluded that the effect was Not Significant		
Decommissioning									
Vessel Displacement	OAA and Offshore ECC	Co11, Co34, and Co53	All Vessels	Reasonably Probable	Negligible	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Increased vessel to vessel collision risk between third-party vessels	OAA and Offshore ECC	Co11, Co31, Co33, Co34, Co53, Co9, and Co10	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant
Increased vessel to vessel collision risk	OAA and Offshore ECC	Co24, Co11, Co36, Co31, Co33, Co34,	All Vessels	Negligible	Serious	Broadly Acceptable	No additional mitigation measures have been identified for this effect	Broadly Acceptable	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
between a third-party vessel and a Salamander Project vessel		Co53, Co9, and Co10					above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant		
Vessel to structure allision risk	OAA	Co35, Co24, Co11, Co36, Co31, Co33, Co34, Co53, Co9, Co10 and Co18	All Vessels	Remote	Serious	Tolerable and ALARP	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Tolerable and ALARP	Not Significant
Reduced access to local ports	OAA and Offshore ECC	Co11 and Co18	Vessels and Port Services	Extremely unlikely	Minor	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant

Salamander Project Activity and Impact	Project Aspect	Embedded Mitigation	Receptor	Frequency of Occurrence	Severity of Consequences	Significance of Risk	Additional Mitigation	Residual Significance of Risk	Significance of Effect in EIA Terms
Reduction of emergency response capability	OAA and Offshore ECC	Co11 and Co36	Emergency Response Resources	Extremely unlikely	Moderate	Broadly Acceptable	No additional mitigation measures have been identified for this effect above and beyond the embedded mitigation listed in **Section 14.8.3** as it was concluded that the effect was Not Significant	Broadly Acceptable	Not Significant

14.12 Mitigation and Monitoring

14.12.1.1 While no significant impacts have been identified in the impact assessment, as the details around underkeel clearance and wet storage is not clear at this time, the additional mitigation is proposed in **Table 14-13**. As no significant impacts are identified, no specific monitoring is proposed noting this will be discussed with the MCA and NLB as part of the additional mitigation is proposed in **Table 14-13.**

Table 14-13 Additional mitigation for the Shipping and Navigation assessment

Potential Impact and Effect	Mitigation ID	Mitigation	Project Aspect	Project Phase
Interaction with wet stored subsea infrastructure	Co38	Consultation with MCA and NLB on any necessary mitigations once wet storage design requirements are known.	OAA	Construction
Interaction with subsea infrastructure	Co37	Consultation with MCA and NLB on clearance depths once underkeel clearance is confirmed to reduce interaction with subsea infrastructure to ALARP.	OAA	Construction, O&M, and Decommissioning

14.13 Cumulative Effect Assessment

14.13.1.1 A Cumulative Effects Assessment (CEA) has been made based on existing and proposed developments in the Study Area **Volume ER.A.4, Annex 6.2: Cumulative Effects Assessment Technical Annex**. The approach to the CEA is described in **Volume ER.A.4, Annex 6.2 Cumulative Effects Assessment Technical Annex**. Cumulative effects are defined as those effects on a receptor that may arise when the development is considered together with other projects.

14.13.1.2 As noted in **Volume ER.A.4, Annex 6.2: Cumulative Effects Assessment Technical Annex**, the cut-off date for cumulative assessment of new projects submitting consent and scoping applications was up to six months before the Salamander Project's offshore application submission; six months prior is the end of October 2023. Projects submitting an application or scoping report between six and two months before submission will be acknowledged but not assessed in the EIAR. A review of projects was undertaken in early March (i.e. less than two months prior to submission) and the projects that have submitted a scoping report between October and March are Stromar Offshore Wind Farm and the Broadshore Hub (Broadshore, Sinclair and Scaraben Projects) in January 2024.

14.13.1.3 The maximum spatial extent of potential effects on Shipping and Navigation as identified within this chapter have been determined by a screening process undertaken within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. This process has screened cumulative developments within a 50 nm radius to determine which may impact routeing on a cumulative basis. A tiering approach has been undertaken based on

proximity to the OAA, data confidence, and status. Full details are provided in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**.

14.13.1.4 On this basis, the projects considered within this cumulative assessment are:

- Tier 1: Muir Mhòr, MarramWind[1], Green Volt (array area and offshore export cables), Eastern Green Link 2 (EGL2), Cenos Floating Offshore Wind Farm export cable, NorthConnect subsea cable; and
- Tier 2: Buchan, Morven, Ossian, and Caledonia.

14.13.1.5 Further information on these projects is outlined in Volume ER.A.4, Annex 6.2 Cumulative Effects Assessment Technical Annex.

14.13.2 Cumulative Vessel Displacement

14.13.2.1 Cumulative routeing has been considered within **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, with the assessment showing that Green Volt, MarramWind, and Muir Mhòr may impact routes also impacted by the Salamander Project. These projects are all in excess of 18 nm from the OAA, and based on the cumulative analysis in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, while deviations will be required, there is searoom to safely accommodate them. It is also noted that given the small scale of the Salamander Project, any localised deviations around the OAA will be small, and therefore not contribute significantly to wider cumulative deviations.

14.13.2.2 There may be limited deviations associated with other screened in subsea cable installations, however any such deviations will be spatially limited to the area around the operation and temporary in nature.

14.13.2.3 On this basis, when considering the size of the overarching cumulative area assessed and the small scale of the OAA, cumulative displacement is assessed as being of **Negligible** consequence in terms of navigational safety but of **Reasonably Probable** occurrence, meaning significance is **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.13.3 Cumulative Increased Vessel to Vessel Collision Risk Between Third-party Vessels

14.13.3.1 Cumulative routeing impacts are expected, however as per **Section 14.13.2** are anticipated to be minor at a localised level and therefore not contribute largely to wider cumulative deviations. There is also searoom available in all directions to safely accommodate any deviations, with the closest existing development being Hywind Scotland in excess of 5 nm to the south, and the closest proposed cumulative developments being in excess of 15 nm away.

14.13.3.2 On this basis, when considering the size of the cumulative area assessed relative to the scale of the Salamander Project, cumulative increase in collision risk is assessed as being of **Serious** consequence in terms of navigational safety but of **Negligible** occurrence, meaning significance is **Broadly Acceptable** and **Not Significant** in EIA terms.

14.13.4 Cumulative Increased Vessel to Vessel Collision Risk Between a Third-party Vessel and a Salamander Project Vessel

14.13.4.1 Ports used by the Salamander Project and other cumulative developments cannot be confirmed at this stage, however there is the potential that similar ports could be used by developments to mobilise vessels from.

[1] Distances provided for MaramWind are based on the ECC area of search, and should not be considered necessarily indicative of the route that will subsequently be proposed.

On this basis, there may be a cumulative increase in Salamander Project vessels within the general area, which may lead to increased encounters and collision risk. However, all developers should be establishing appropriate vessel management systems (e.g. marine coordination) and as such any encounters will be managed, including by COLREGs and SOLAS. The VMP is also a standard condition of consent for Scottish projects and it can therefore be assumed that all projects will be implementing one.

14.13.4.2 It is noted that there is already regular wind farm traffic vessel activity in the area associated with Hywind Scotland, and as such passing vessels will be familiar with ongoing wind farm operations being undertaken.

14.13.4.3 There may be additional collision risk associated with the vessels associated with the installation of other screened in subsea cable installations, however any such risk would be managed including by COLREGs and SOLAS.

14.13.4.4 On this basis, when taking into considering the size of the cumulative area assessed, cumulative increase in collision risk (third party to Salamander Project vessel) is assessed as being of **Serious** consequence in terms of navigational safety but of **Negligible** occurrence, meaning significance is **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.13.5 Vessel to Structure Allision Risk

14.13.5.1 All cumulative developments will be required to implement lighting and marking in agreement with NLB and in compliance with IALA G1162 (IALA, 2021). For each development these discussions will include consideration of the current cumulative understanding, thus minimising allision risk on a cumulative basis, noting that all layouts will also need to be agreed with the MCA and NLB, with surface navigation and allision risk forming part of these discussions.

14.13.5.2 Allision hazards associated with internal navigation will be localised to each individual development, noting there are no projects directly adjacent to the OAA. There is searoom available in all directions to safely accommodate vessel transits without a need for vessels to pass in close proximity to structures, with the closest existing development being Hywind Scotland in excess of 5 nm to the south, and the closest proposed cumulative developments being in excess of 15 nm away.

14.13.5.3 On this basis, when taking into considering the size of the cumulative area assessed relative to the scale of the Salamander Project, cumulative increase in allision risk is assessed as being of **Serious** consequence in terms of navigational safety but of **Negligible** occurrence, meaning significance is **Broadly Acceptable**, and therefore **Not Significant** in EIA terms.

14.13.6 Cumulative Reduced Access to Local Ports

14.13.6.1 Ports used by the Salamander Project and other cumulative developments cannot be confirmed at this stage, however there is the potential that similar ports could be used by developments to mobilise vessels from. On this basis, there may be a cumulative increase in Salamander Project vessels within the general area, which may lead to increased impact on port access. However, all developers should be establishing appropriate vessel management systems (e.g. marine coordination) and the VMP is also a standard condition of consent for Scottish projects and it can therefore be assumed that all projects will be implementing one.

14.13.6.2 As discussed in **Section 14.11**, the infrastructure associated with the Salamander Project is not anticipated to impact port access to local ports based on proximity, and in this regard it is noted that screened in cumulative development arrays are further offshore. Other screened in subsea cables may pass in closer

proximity to Peterhead than the Offshore ECC, however any impact would be temporary and spatially limited to the area immediately around the cable installation.

14.13.6.3 The frequency of occurrence is considered **Extremely Unlikely** given Salamander Project vessel movements will be managed via marine coordination and VMP. Severity of consequence is considered **Minor**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.13.7 Cumulative Reduction of Emergency Response Capability

14.13.7.1 As per the incident assessment in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**, baseline incident rates are low. Further, additional cumulative developments mean additional resources would be available. For these reasons there is not considered likely to be a notable effect on emergency response resources on a cumulative level. This takes account of historical data showing that allisions and collisions caused by wind farms do not occur at a high frequency (as detailed in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**).

14.13.7.2 All wind farm developments will be required to comply with MGN 654 (MCA, 2021), and to agree layout with the MCA, which will ensure suitable SAR access is available. Regardless there are no existing or planned projects in direct proximity to the OAA. As such no cumulative impact on SAR access is anticipated.

14.13.7.3 The frequency of occurrence is considered **Extremely Unlikely** noting the limited anticipated effect on incidents rates and MGN 654 compliance including in relation to layout design and SAR access. Severity of consequence is considered **Moderate**. On this basis the significance of risk is assessed to be **Broadly Acceptable** and therefore **Not Significant** in EIA terms.

14.14 Assessment of Impacts Cumulatively with the Onshore Development

14.14.1.1 The Onshore Development components are summarised in **Volume ER.A.2, Chapter 4: Project Description**. These Project aspects have been considered in relation to the impacts assessed within this chapter. Due to the wholly offshore nature of the potential impacts identified for Shipping and Navigation it has been concluded that no impacts or resultant effects are expected on Shipping and Navigation receptors cumulatively with the Onshore Development activities.

14.15 Transboundary Effects

14.15.1.1 Transboundary effects are defined as effects that extend into other European Economic Area (EEA) states. These may occur from the Salamander Project alone, or cumulatively with other plans or projects.

14.15.1.2 Transboundary impacts in relation to vessel routeing (including to both UK and international ports) have been assessed within **Section 14.11** for the Salamander Project in isolation and **Section 14.13** on a cumulative basis. Individual transits may have the potential to be associated with vessels that are internationally owned or located, however any such transits have been captured within the baseline assessment of vessel traffic (noting further detail and assessment is provided in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**).

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

14.16 Inter-related Effects

14.16.1.1 The following assessment considers the potential for inter-related effects to arise across the three project phases (i.e. project lifetime effects) as well as the interaction of multiple effects on a receptor (i.e. receptor-led effects).

- Project lifetime effects are considered to be effects that occur throughout more than one phase of the project, (construction, operation and maintenance, and decommissioning) to interact to potentially create a more significant effect on a receptor, than if just assessed in isolation in these three key project phases (e.g. construction phase, operational phase and decommissioning).
- Receptor-led effects involve spatially or temporal interaction of effects, to create inter-related effects on a receptor or receptor group. Receptor-led effects might be short term, temporary or transient effects, or incorporate longer term effects.

14.16.1.2 It is important to note that the inter-related effects assessment considers only effects produced by the offshore elements of the Salamander Project and not from other projects, which are considered within **Volume ER.A.4, Annex 6.2: Cumulative Effects Assessment Technical Annex**.

14.16.1.3 The significance of the individual effects, as determined in **Section 14.11** is presented herein for each receptor group. A descriptive assessment of the scope for these individual effects to interact to create a different or greater effect has then been undertaken. This assessment incorporates qualitative and, where reasonably possible, quantitative assessments. It should be noted that the following assessment does not assign significance of effect for inter-related effects; rather, any inter-related effects that may be of greater significance than the individual effects acting in isolation on a given receptor are identified and discussed.

14.16.1.4 The potential interactions that may arise leading to inter-related effects can be distinguished between 'project lifetime effects' which arise during the construction, operation and maintenance and/or decommissioning phase or 'receptor-led effects' which include inter-relationships between environmental topics i.e. marine mammals and offshore ornithology.

14.16.1.5 Potential interactions that may contribute to inter-related effects over the Salamander Project lifetime include:

- Vessel-to-vessel collision due to the presence of Salamander Project vessels and displacement of vessels from the OAA;
- Vessel-to-structure contact due to the presence of semi-submersible floating platform/WTGs;
- Snagging with semi-submersible floating platform/WTG moorings, Inter-array Cables or the Offshore Export Cable; and
- A change in navigable water depth.

14.16.1.6 The scale of the above inter-related effects is increased during the construction phase, however across the Salamander Project lifetime the effects on Shipping and Navigation are not anticipated to interact in such a way that will result in combined effects of greater significance than the assessment of each individual phase.

14.16.1.7 Regarding receptor-led inter-related effects, an increase in vessel numbers and the displacement of vessels out with the OAA, has potential to have effects on marine mammals and offshore ornithology. However, the contribution of Shipping and Navigation to overall disturbance of these receptors will be minimal and would not be sufficient to increase the significance of any individual effect significances.

14.17 Conclusion and Summary

14.17.1.1 This chapter has assessed impacts to Shipping and Navigation users based on technical assessment undertaken in **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. The NRA has been completed in compliance with the relevant MCA guidance in the form of MGN 654 (MCA, 2021), and this has been evidenced by a completed MGN 654 checklist appended to **Volume ER.A.4, Annex 14.1: Navigational Risk Assessment**. Assessment methodology in the chapter and NRA has followed the IMO FSA approach as per MGN 654.

14.17.1.2 The assessment showed all hazards to be at most of tolerable risk significance, and ALARP with the exception of potential interaction with subsea infrastructure. Assuming the implementation of additional mitigation in the form of consultation with the MCA and NLB once underkeel clearance depths are confirmed, this hazard is also tolerable and ALARP.

14.18 References

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