Salamander Offshore Wind Farm

Offshore EIA Report

Volume ER.A.2, Chapter 3: Site Selection and Consideration of Alternatives

SALAMANDER

Powered by Ørsted and Simply Blue Group

Document Title:	Site Selection and Consideration of Alternatives
Document no:	08545190
Project:	Salamander Offshore Wind Farm
Revision	00
Originator	Salamander Wind Project Company
Date	April 2024

Revision History:

Revision	Date	Status	Originator	Reviewed	Approved
00	19 April 2024	Final	Salamander	Salamander	Hugh Yendole

Table of Contents

List of Tables

List of Figures

Glossary

Term	Definition
Applicant	Salamander Wind Project Company Limited (formerly called Simply Blue Energy (Scotland) Limited), a joint venture between Ørsted, Simply Blue Group and Subsea7.
Contracts for Difference	The Contracts for Difference (CfD) scheme is the UK government's main mechanism for supporting low-carbon electricity generation. CfDs incentivise investment in renewable energy by providing developers of projects with high upfront costs and long lifetimes with direct protection from volatile wholesale prices.
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.
Energy Balancing Infrastructure (EBI)	Energy Balancing Infrastructure which will provide services to the electrical grid, such as storing energy to meet periods of peak demand and improving overall reliability, as well as additional services such as system monitoring and computing. EBI will be housed within buildings and / or containers will be co-located with the Onshore Substation.
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 collection and consideration of environmental information, which fulfils the assessment requirements of the Environmental Impact Assessment (Scotland) Regulations (2017), including the publication of an Environmental Impact Assessment Report (EIAR).
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

Term	Definition
	Works (EIA) Regulations 2007, and the Town and Country Planning (EIA) (Scotland) Regulations 2017.
Environmental Impact Assessment Report (EIAR)	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations.
Export Cable Corridor	The specific corridor of seabed (seaward of Mean High Water Springs (MHWS)) and land (landward of MHWS) from the Offshore Array Area to the Onshore Substation, within which the export cables will be located.
Inter-array Cables	Offshore cables which link the wind turbines to each other and to the Offshore Export Cable(s).
INTOG Leasing Round	The Innovation and Targeted Oil and Gas (INTOG) leasing round where developers apply for the rights to build offshore wind farms specifically for the purpose of providing low carbon electricity to power oil and gas installations and help to decarbonise the sector.
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.
National electricity grid	The high voltage electricity transmission network in Scotland is owned and maintained by the Great Britain Transmission Network Operator. This will be Scottish and Southern Electricity Networks (SSEN) for the location of the Salamander Project.
Offshore Array Area	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.
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).

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).
Onshore Development	The entire Onshore Development, including Construction Compounds at the Landfall, temporary working areas, Onshore Export Cables, Transition Joint Bay, Joint Bays, Onshore Substation and Energy Balancing Infrastructure, Construction Compounds, any associated landscaping (if required) and access (and all other associated infrastructure) across all Project phases from development to decommissioning, for which the Applicant is seeking consent.
Onshore Development Area	The total area comprising the Landfall, Onshore Export Cable Corridor, and Onshore Substation, EBI and associated infrastructure.
Onshore Substation	Comprises a compound containing the electrical components for transforming the power supplied from the Salamander Project to 132 kV and to adjust the power quality and power factor, as required to meet the UK Grid Code for supply to the National Grid. The onshore substation is also the compound in which EBI and associated infrastructure will be co-located.
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.
Salamander Project	The proposed Salamander Offshore Wind Farm. The term covers all elements of both the offshore and onshore aspects of the project.
Salamander Project Team	The project team from Simply Blue Energy (Scotland) Limited, responsible for developing the Salamander 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.
ScotWind	Crown Estate Scotland offshore wind leasing programme.
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

Term	Definition
	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.
Tension Leg Platform	A Tension Leg Platform is a semi-submerged buoyant structure, anchored to the seabed with tensioned mooring lines. The combination of the structure buoyancy and tension in the anchor/mooring system provides the platform stability. This system-driven stability (as opposed to the stability coming just from the floating substructure itself) allows for a comparatively smaller and lighter structure compared to Semi-Submersible equivalents.
Trenched methods	Also referred to as trenchless crossing techniques or trenchless methods. These techniques include Horizontal Directional Drilling (HDD), thrust boring, auger boring, pipe jacking and arc drilling, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.
Trenchless methods	Also referred to as trenchless crossing techniques or trenchless methods. These techniques include, thrust boring, auger boring, pipe jacking and arc drilling, which allow ducts to be installed under an obstruction without breaking open the ground and digging a trench.
Wind Turbine Generator	All the components of a wind turbine, including the tower, nacelle, and rotor.

Acronyms

Term	Definition
AoS	Area of Search
BSUoS	Balancing Services Use of System
CBRA	Cable Burial Risk Assessment
CCS	Carbon-Capture and Storage
CEA	Cumulative Effects Assessment
CES	Crown Estate Scotland
CNOOC	China National Offshore Oil Corporation
Defra	Department for Environment Food & Rural Affairs

Term	Definition
DSLP	Design Specification and Layout Plan
EBI	Energy Balancing Infrastructure
ECC	Export Cable Corridor
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMF	Electromagnetic field
FID	Final Investment Decision
FPS	Forties Pipeline System
GHG	Greenhouse gas
GIS	Geographical Information System
GW	Gigawatt
HVAC	High Voltage Alternating Current
IMO	International Maritime Organisation
INTOG	Innovation and Targeted Oil and Gas
JV	Joint Venture
kJ	Kilojoules
km	Kilometre
kV	Kilovolt
LCoE	Levelised Cost of Energy
m	Metre
MD-LOT	Marine Directorate - Licensing Operations Team
MHWS	Mean High Water Springs
MS-LOT	Marine Scotland - Licensing Operations Team

Term	Definition
MW	Megawatt
NCMPA	Nature Conservation Marine Protected Area
nm	Nautical mile
NPF	National Planning Framework
O&G	Oil and Gas
O&M	Operations and Maintenance
PAC	Pre-Application Consultation
PEXA	Military Exercise Areas and Danger Area
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SWPC	Salamander Wind Project Company
SFF	Scottish Fishermen's Federation
SLVIA	Seascape, Landscape and Visual Amenity
SPA	Special Protection Area
SSEN	Scottish and Southern Electricity Networks
SSSI	Site of Special Scientific Interest
SWFPA	Scottish White Fish Producers Association
SWOT	Strengths, Weaknesses, Opportunities, Threats
TLP	Tension Leg Platform
TNUoS	Transmission Network Use of System
UXO	Unexploded Ordnance
WTG	Wind turbine generator

3 Site Selection and Alternatives

3.1 Introduction

3.1.1.1 The Applicant, Salamander Wind Project Company Limited (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 Project Design).

3.1.1.2 This chapter of the Offshore Environmental Impact Assessment Report (EIAR) presents an overview of the selection process and alternatives considered for the location and design of the Salamander Project, specifically the alternative project locations and technical aspects considered for the Salamander Project seaward of Mean High Water Springs (MHWS), hereafter referred to as the 'Offshore Development'. Details of the site selection process and assessment of alternative technical components of onshore infrastructure will be presented in the separate Onshore EIAR.

3.1.1.3 This chapter should be read alongside and in consideration of **Volume ER.A.2, Chapter 4: Project Description**.

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

3.2 Purpose

3.2.1.1 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 selection process and alternatives considered for the location and design of the Offshore Development.

3.2.1.2 The EIAR has been finalised following the completion of the pre-application consultation (**RP.A.4.1 Pre-Application Consultation (PAC) Report**) and the Salamander EIA Scoping Report (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 (for works within 12 nautical miles (nm)) and the Marine and Coastal Access Act 2009 (for works from 12 to 200 nm).

3.2.1.3 The chapter has been produced in line with relevant Environmental Impact Assessment (EIA) legislation. The EIA Regulations (as defined in **Volume ER.A.2, Chapter 2: Legislative Context and Regulatory Requirements**) require that an EIAR include information on alternatives to the relevant project studied by the developer:

"a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".

3.3 Consultation

3.3.1.1 Consultation is a key part of the application process. It has played an important part in ensuring that the chosen location of the Salamander Project would either avoid causing, or minimise as far as possible, any adverse effects on the environment.

3.3.1.2 Consultation regarding Site Selection has been conducted from the early stages of the Salamander Project prior to the application for an Exclusivity Agreement through the Crown Estate Scotland's (CES) Innovation and Targeted Oil and Gas (INTOG) seabed leasing round; further detail of this process is provided in **Section 3.4**.

3.3.1.3 An overview of the Salamander Project consultation process is outlined in **Volume ER.A.2, Chapter 5: Stakeholder Consultation**. Since the INTOG application, consultation regarding Site Selection and Alternatives has continued through the EIA Scoping process.

3.3.1.4 The issues raised within the Scoping Opinion specific to Site Selection and Alternatives are outlined in **Table 3-1**, including consideration of where the issues have been addressed within the EIAR.

Table 3-1 Consultation Responses Specific to Site Selection and Alternatives

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	2.2.7 It is noted that the final onshore development location will be confirmed following future site selection activities which will be informed by engineering studies as well as the findings from the EIA process.	The location for the Onshore Development has been refined since submission of the Scoping Report, with the indicative location shown in **Figure 3-5**. Further discussion on the reasons for this site selection and the alternatives considered will be presented in the Site Selection and Alternatives chapter within the Onshore EIAR.
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	2.6.15 The EIA Regulations require that the EIA Report include 'a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the Developer, which are relevant to the proposed works and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'. The Scottish Ministers note that the Developer's Scoping Report did not indicate any consideration of alternatives. The Scottish Ministers advise considerations must include how decommissioning has been taken into account within the design options. The Scottish Ministers advise that this must be based on the presumption of as close to full removal as possible of all infrastructure and assets and should consider the methods and processes of doing so.	Decommissioning of the proposed offshore infrastructure for the Salamander Project has been considered from the early stages of the design process and will continue to be so throughout the Construction phase, with decommissioning considered during design risk assessment and technology selection processes. Whilst full details on decommissioning plans for the Salamander Project have not been developed yet as this is dependent technology selection and detailed design, the proposed principles for decommissioning of the project infrastructure are provided in **Volume ER.A.2, Chapter 4: Project Description**, and qualitative assessment of the potential impacts from decommissioning has been undertaken in all the impact assessment chapters. In line with Section 105 of the Energy Act, the Applicant will prepare a Decommissioning Programme for the Offshore Development post-consent for approval by the Scottish Ministers prior to construction commencing. This programme will consider comparative assessments of decommissioning options and, in line with the Scottish Government's guidance,

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
			the initial presumption will be that all offshore components (above and below seabed) are to be removed, as far as technically feasible. Throughout the Offshore Development's Operation and Maintenance phase, the Decommissioning Programme will be reviewed and updated every five years and decommissioning best practices and legislation will be applied at the time of the Offshore Development's decommissioning.
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	2.6.16 For the avoidance of doubt, the Scottish Ministers advise that the EIA Report must include an up to date consideration of the reasonable alternatives studied as the parameters of the Proposed Development have been refined. This includes but is not limited to the identification of the potential wind turbine layouts within the array area, the parameters of the export cables, the cable corridor options and the landfall location or locations. The Scottish Ministers expect this to comprise a discrete section in the EIA Report that provides details of the reasonable alternatives studied across all aspects of the Proposed Development and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.	This chapter of the EIAR sets out the site selection process and alternatives considered by the Applicant for the Offshore Development. This includes consideration of the chosen location of the Offshore Array Area and the Offshore Export Cable Corridor, and the reasons for this site selection, which are described in **Section 3.4**. Discussion on the technical alternatives considered by the Salamander Project team is provided in **Section 3.5**, which identifies aspects and parameters of the offshore infrastructure that have progressed since that proposed in the Scoping Report, the reasons behind these refinements and analysis of the potential environmental effects from these decisions. Due to the novel technology proposed, some flexibility in the final design of the Offshore Development will be necessary to ensure the Salamander Project can utilise the most technologically advantageous solution, which will ultimately provide the best cost of energy to the consumer. Therefore, the final parameters of several aspects of the Offshore Development are not yet confirmed, and consequently the Offshore Development will be assessed using a Design Envelope

Consultee	Date and Forum	Comment	Where it is addressed within this EIAR
			approach as set out in **Volume ER.A.2, Chapter 6: EIA Methodology**.
Marine Directorate – Licensing Operations Team (MD-LOT)	21 June 2023; Scoping Opinion	Section 4.6.5 of the Scoping Report states that the offshore export cables will make landfall north of Peterhead. With regard to methods of export cable installation, trenched or trench-less landfall techniques such as Horizontal Directional Drilling or similar is expected to be used. The EIA Report must describe and assess the options considered for cable installation at landfall and must also explain the reasons for the selected installation option(s). The EIA Report must clearly detail the landfall location and state the site-specific considerations. The EIA Report must also outline the steps taken to mitigate any environmental impacts resulting from the cable landfall.	Since the submission of the Scoping Report, the Salamander Project has made the decision to remove a trenched landfall solution within the sand dune system above MHWS and intertidal zone. The key environmental benefits from this decision are provided in the Landfall section of **Table 3-6**, with further detail of the Landfall design provided in **Volume ER.A.2, Chapter 4: Project Description.** The potential environmental impacts of the Landfall operations are assessed in the relevant topic specific impact assessment chapters of the EIAR.

3.4 Offshore Site Selection Considerations

3.4.1 Overview

3.4.1.1 Whilst the 'Do Nothing' option may not be considered a true alternative that must be considered in an EIAR, **Section 3.4.2** provides a brief justification for the need for the Salamander Project.

3.4.1.2 A comprehensive site selection exercise was undertaken by the Applicant in 2020 to identify the optimal site for the Offshore Array Area taking into consideration environmental, commercial, socio-economic and technical factors; this is presented in **Section 3.4.2**.

3.4.1.3 Following engagement with key stakeholders and selection of the final Area of Search (AoS) for the Offshore Array, options for Offshore Export Cable routes were considered alongside the requirements for onshore infrastructure and potential grid connections. The options considered for the Offshore Export Cable Corridor (ECC) and the process of selecting the preferred route are presented in **Section 3.4.4**.

3.4.1.4 Further refinement of both the Offshore Array Area and the Offshore ECC was undertaken during 2022 prior to submission of the Salamander Offshore Wind Farm EIA Scoping Report (SBES, 2023); this refinement is presented in **Section 3.4.5**.

3.4.1.5 Whilst the location of the Offshore Array is confirmed (as this is the site that the Salamander Project has secured an Exclusivity Agreement from CES), the exact layout of the Offshore Array within the site boundary has not been developed yet, and so there is no change to the boundary of the Offshore Array Area to that presented at Scoping.

3.4.1.6 There have been no changes to the Offshore ECC since submission of the Scoping Report. The Salamander Project planned to undertake geophysical and environmental surveys of the seabed in the nearshore region of the Offshore ECC in summer 2023. The data from these surveys was required to inform engineering studies relating to the cable route and landfall options, including refinement of the Landfall location. The data was also intended to inform the baselines for relevant topic environmental impact assessments (e.g. benthic ecology, marine physical processes, marine archaeology). However, it was not possible to acquire project specific, or secondary survey data, within the area from the MLWS at the Landfall location, through to the 1°40 line (approximately 8 km) (referred to as the Nearshore ECC) in 2023. Consequently, it has not been possible to refine the Offshore ECC or Landfall prior to submission of the EIAR in early 2024. However, the lack of data has not prevented the relevant impact assessments from being undertaken for the EIAR; this was agreed with MD-LOT and other key stakeholders on 14 September 2023 (Minutes of Meeting, 08379231), and the Salamander Project has committed to acquiring the nearshore seabed data post-consent to corroborate the conclusions of the impact assessments.

3.4.1.7 **Section 3.5** sets out any refinements to the Offshore Development that have taken place since Scoping as a result of the EIA process and in response to consultation and stakeholder feedback, and also describes the main alternatives that have been considered as part of this process.

3.4.2 'Do Nothing' Option

3.4.2.1 The 'do nothing' option means not proceeding with the Salamander Project at all. 'Do nothing' would not only mean the loss of 100 MW of renewable generation capacity, but would also equate to the loss of one of a number of 'stepping-stone' projects which are essential to realising the potential of floating offshore wind in Scotland. At worst, it would decrease confidence in the anticipatory investment needed by the Scottish supply chain ahead of the large-scale floating offshore wind projects and fail to respond to the need to ready the local supply chain to take advantage of future commercial scale projects.

3.4.2.2 The aim of CES including innovation projects such as the Salamander Project in the INTOG leasing round was to help reduce costs and risk for future offshore wind projects, and develop Scotland as a destination for innovation and technical development. The Salamander Project is a 'supply chain' project, that plans to connect to the grid and bring a broad range of innovations to the commercial market that will be deliverable by the local Scottish supply chain. Many of the innovations proposed by the Salamander Project in the INTOG bid application were developed to achieve the following:

- Offshore innovations increasing local fabrication potential and lowering costs and risk;
- Onshore system integration innovations to develop markets and reduce commercial risk;
- Innovations to maximize coexistence and co-location;
- Innovations to improve the environmental footprint of offshore wind; and
- Knowledge sharing partners to support skill development and job creation.

3.4.2.3 Alongside the Salamander Project, four other innovation projects were awarded exclusivity agreements by CES as part of the INTOG leasing round. Importantly, CES chose to lease to a cohort of innovation projects, understanding that the future technologies which will support Great Britain's energy security and decarbonisation are many, and that trialing alterative solutions is a crucial part of the development of the floating sector, and so it is important to have multiple 'stepping-stone' projects. It is also well understood that Scotland will need multiple installation ports in order to be able to deliver the ScotWind pipeline, and so multiple innovation projects are required to provide that learning opportunity to multiple ports.

3.4.2.4 The 'do nothing' option would add delivery risk to the large-scale floating projects in Scotland's pipeline through: a less mature supply chain; lower supply chain capacity to deliver the pipeline of projects necessary to meet climate and renewable generation targets; and greater technology risk. These factors in turn would likely add further delay to future projects. Even if those future projects were delivered, they would be delivered with a lower share of local supply chain.

3.4.2.5 Furthermore, as stated in **Volume ER.A.2, Chapter 1: Introduction**, once operational, the Salamander Project will contribute to Scotland's net-zero targets set out in the Climate Change (Scotland) Act 2009 and the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019. The Salamander Project will also contribute to the wider UK target to produce 50 gigawatt (GW) of operational offshore wind energy by 2030 and the Scottish Government's ambition within the Draft Energy Strategy and Just Transition Plan for deployment of up to 11 GW installed offshore capacity by 2030.

3.4.2.6 The Salamander Project will provide benefit to the UK's net zero strategy and can be seen as having a beneficial effect on the risk of climate change by avoiding greenhouse gas (GHG) release, when compared to a baseline where non-renewable energy sources are used for energy generation in the UK. The contribution that the Salamander Project operating for 35 years will actively make to UK targets for net zero emissions is presented in detail in **Volume ER.A.3, Chapter 20: Climate Change and Carbon**.

3.4.2.7 In addition to the net zero contributions, the Salamander Project will also deliver EBI to provide support for the stability and reliability of renewable energy generation. There is a national requirement to balance the peaks and troughs associated with electricity supply and demands, to avoid strains on transmission and distribution networks, and to add stability to the electricity system.

3.4.2.8 The 'do nothing' option would not achieve any of the Salamander Project's aims to develop innovations designed to benefit future Scotwind projects or strengthen the Scottish supply chain, nor would it help to reduce GHG emissions and progress towards Scotland and the UK's net zero targets.

3.4.2.9 For all the above reasons, the "do nothing" option was discounted.

3.4.3 Offshore Area of Search

3.4.3.1 Initial site selection aimed to identify potential an AoS within Scottish waters of a sufficient size to accommodate a floating offshore wind development of up to 300 MW; the site selection considered the entire Scottish coastline.

3.4.3.2 This was based on key criteria (technical, environmental, socio-economic and commercial), and identified eight potential AoS, which following further review was reduced to six AoS to take to the next stage of site selection.

3.4.3.3 One of the two AoS that was discounted was considered to have limited potential for micro-siting an Offshore Array Area within the AoS due to the available room between the ScotWind Draft Plan Option N1 (now West of Orkney Agreement for Lease) and the 15 km buffer from shore used to limit seascape, landscape and visual impacts, which meant that the AoS would be limited to an area of approximately 100 km^2. This AoS also had potential to interfere with two main helicopter routes that intersected it. The other AoS was discounted due to the likely negative impact on shipping and constraints resulting from the proximity to existing infrastructure leading to challenges in achieving a favourable field layout.

3.4.3.4 The six remaining AoS were put through a comparative Strengths, Weaknesses, Opportunities, Threats (SWOT) review of environmental, technical, and commercial constraints which were considered to have the potential to increase the technical and/or consenting risks associated with a specific site.

3.4.3.5 The objective of the SWOT analysis was to consider each site in turn and score each AoS based on a number of receptors (12 environmental (including socio-economic), 15 technical and 6 commercial) as presented in **Table 3-2** below.

Table 3-2 Receptors Used for Comparative Analysis of Areas of Search

Environmental	Technical	Commercial
Benthic ecology	Ports: Installation	Oil & Gas: Site leases
Fish and shellfish ecology	Ports: Operations and maintenance (O&M)	Oil & Gas: Electrification
Ornithology	Grid: Offshore substation[1]	Grid charges: Transmission Network Use of System (TNUoS) / Balancing Services Use of System (BSUoS)
Marine mammals	Grid: Export cable	Reputational factors including developer interaction and political opposition
Aviation and radar	Grid: Onshore substation connection	O&M strategy

[1] There is now no offshore substation planned as part of the Salamander Project, and that is therefore not considered further within the EIAR.

Environmental	Technical	Commercial
Shipping and navigation	Met-ocean: Wind resource	Levelised Cost of Energy (LCoE)
Commercial fisheries	Met-ocean: Wakes	-
Military Exercise Areas and Danger Areas (PEXA)	Met-ocean: Waves – installation	-
Unexploded Ordnance (UXO)	Met-ocean: Waves - design & O&M	-
Other sea users	Met-ocean: Current	-
Seascape, Landscape and Visual Amenity (SLVIA)	Site: Available area	
Onshore grid connection	Site: Seabed / ground conditions	-
-	Site: Topography / Bathymetry	-
-	Site: Suitable technology	-
-	Simply Blue Energy engineering stress score (based on the ratio of mean water depth against wave height)	-

3.4.3.6 The three overarching categories, Environmental, Commercial and Technical, were weighted based on their importance and influence on the site selection process. The 33 sub-categories, as detailed in **Table 3-2**, were subsequently weighted individually based on their inherent risk or potential influence on site suitability. Consideration of the scoring was based on various factors including the scale of the proposed development compared with other proposed projects in Scottish waters.

3.4.3.7 Each receptor was then assessed for each AoS by reviewing the site against the relevant baseline data within the Salamander Project's Geographical Information System (GIS)[2] using the assessment format and scores presented in **Table 3-3** below.

[2] This assessment was undertaken in a live GIS session with 33 parameters under review. It is therefore not possible to display all the constraints within a figure in this EIAR chapter.

Table 3-3 Scoring for Comparative Analysis

Score (Rank) and Interpretation of Risk (Environmental/Consenting, Technical and Commercial)			
2	1	-1	-2
No major risk	Risks present but manageable	High risk	Major difficulties anticipated

3.4.3.8 The outcome is a weighted average score assigned to each AoS which was then used to comparatively rank the sites. The results provided an overall ranking of the six options, and the top three were taken forward for further assessment. The overall results of the comparative (SWOT) analysis are presented in **Table 3-4**, along with the key risks and benefits for each AoS.

Table 3-4 Key Factors and/or Risks associated with each Area of Search

Ranking	Area of Search	Area of Search score	Key Factors and/or Risks	
			Risks	**Benefits**
1	3	0.492	• Average depth across the site (90 m) poses technical challenges for fixed substation (required for a 300 MW project[3]); development of a floating substation seen as too great a project risk due to technology readiness • Significant ornithological consenting risks identified for all the east coast AoS due to connectivity with the Special Protection Areas (SPAs) along the east coast of Scotland	• Situated relatively close to O&G assets, offering an alternative route to market • No significant consenting or technical risks identified with the onshore grid connection at Peterhead substation
2	4	0.441	• No alternative routes to market identified at this preliminary stage as it is likely too far from O&G assets to offer a viable electrification option • Turbot Bank Nature Conservation Marine Protected Area (NCMPA) overlaps the south-eastern edge of AoS; the only AoS in such close proximity to an MPA • Significant ornithological consenting risks identified for all the east coast AoS due to connectivity with the Special Protection Areas (SPAs) along the east coast of Scotland	• Areas within AoS boundary with no significant technical issues for a fixed substation

[3] At this early stage of the site selection, 300 MW project was under consideration, but ultimately not taken forward due to INTOG lease application conditions for Innovation projects

Ranking	Area of Search	Area of Search score	Key Factors and/or Risks	
			Risks	Benefits
3	2	0.414	• Too deep (average depth of 120 m) for a fixed substation • Significant ornithological consenting risks identified for all the east coast AoS due to connectivity with the Special Protection Areas (SPAs) along the east coast of Scotland	• Numerous alternative routes to market identified as situated relatively close to O&G assets, as well as the Acorn carbon-capture and storage (CCS) site
4	6	0.321	• Average depth across AoS (72 m) may constrain the use of certain floating technologies • Considered too far from Port of Nigg – the only port considered ready/suitable for manufacturing and assembly of wind turbine generators (WTGs) and floating foundations (at the time of site selection) • Significant ornithological consenting risks identified for all the east coast AoS due to connectivity with the Special Protection Areas (SPAs) along the east coast of Scotland	• Slightly less environmentally constrained than AoS 2 – 4, though not substantially so to justify selection due to technical issues
5	5	0.320	• Technical issues envisaged for installing a fixed substation within AoS due to average depth of site (90 m). Southern edge of site has some small areas of shallower ground which looks to lie in the 60 m range, however not enough to provide confidence of engineering feasibility at this early site selection stage • Technical issues due to distance from shore. The losses in the export cable from this AoS likely to be too great and preclude the use of an offshore substation; therefore this	• Various O&G assets lie to the east of the AoS could be used for alternative electrification, although they are not high-producing sites and remaining lifetimes are uncertain • Distance from shore resulted in being the most favourable AoS for environmental constraints, including ornithological and marine mammal receptors

Ranking	Area of Search	Area of Search score	Key Factors and/or Risks	
			Risks	Benefits
			AoS considered unfeasible for a 100 MW project, only suitable for a 300 MW scheme	
6	1	-0.045	• Significant technical issues relating to the length of the export cable to the likely grid connection point at Dounreay substation and issues around utilising available capacity at this substation • No suitable alternative routes to market identified at preliminary stage	• Strongest wind resource of all AoS • No significant ornithological consenting risks in comparison to constraints identified for the east coast sites

3.4.3.9 The top three AoS (2, 3 and 4) were presented, along with the site selection approach, to a number of key stakeholders in July 2020. These stakeholders were:

- Marine Directorate - Licensing and Operations Team (MD-LOT) (formerly known as Marine Scotland Licensing Operations Team (MS-LOT);
- Crown Estate Scotland (CES);
- Royal Society for the Protection of Birds Scotland (RSPB);
- Scottish Fishermen's Federation (SFF) and Scottish White Fish Producers Association (SWFPA);
- NatureScot (formerly known as Scottish Natural Heritage (SNH)); and
- China National Offshore Oil Corporation (CNOOC).

3.4.3.10 It was envisaged that the stakeholder meetings would provide the opportunity for external interested parties to input into the selection of the final site out of the top three options. However, the general consensus across the stakeholder meetings was that due to the relatively close proximity of the three sites, and the similarities described above in **Table 3-4**, it was not possible to select a single preferential site over the others within the meetings.

3.4.3.11 Following these stakeholder meetings and a final internal workshop held with the Salamander Project team, a final AoS (AoS 3) was selected, located approximately 35 km east of Peterhead.

3.4.3.12 AoS 3 was chosen as it both maximises the potential for renewable energy production while retaining technical flexibility and minimising environmental impact. It was considered ideal given the metocean conditions and relatively short cable route to a suitable grid connection. Additionally, as a relatively large AoS (approximately 205 km^2) it was considered to provide sufficient opportunity to micro-site the Offshore Array Area within the AoS boundary.

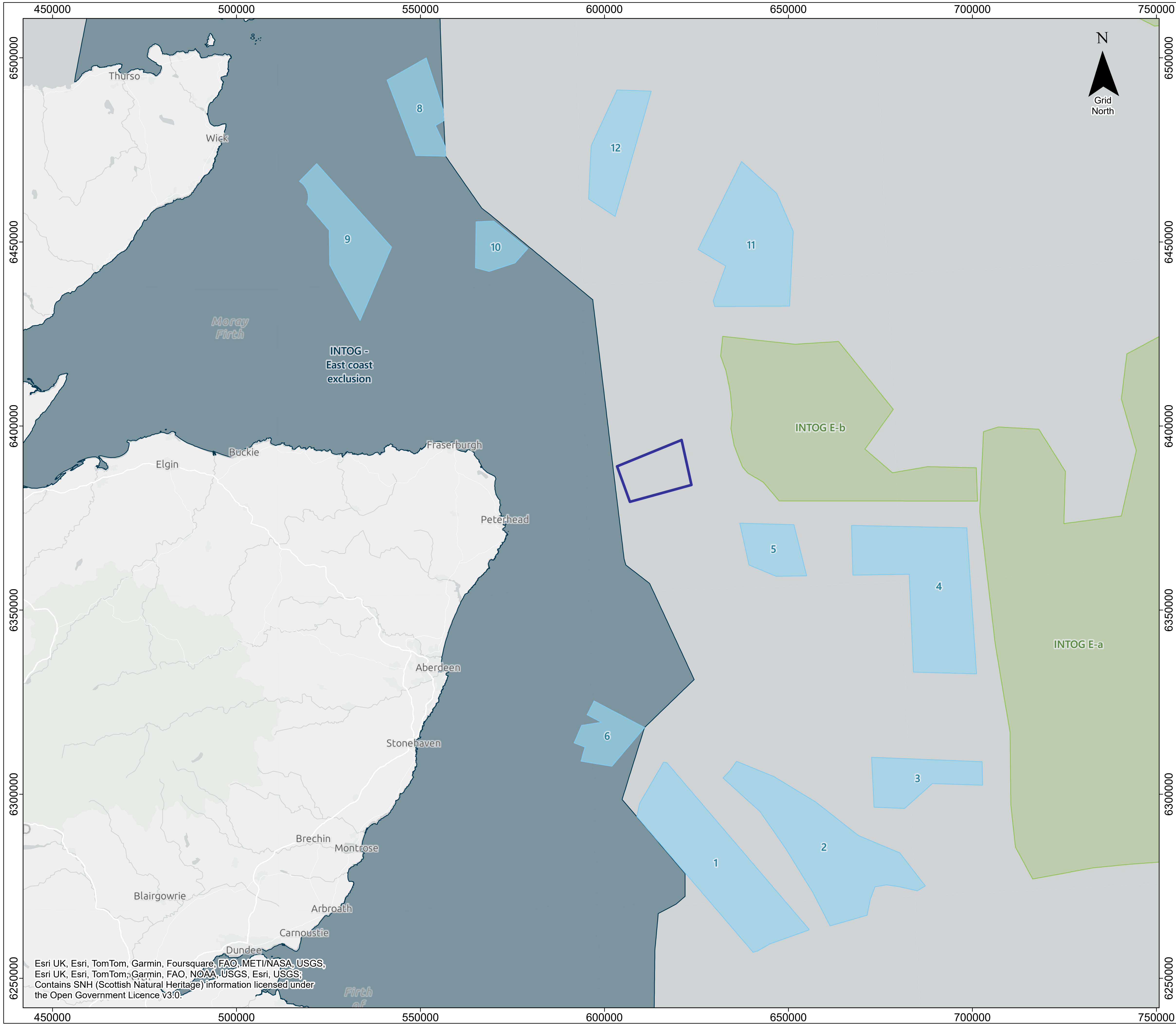
3.4.3.13 The AoS is on the east coast of Scotland, an area in which there is already a spotlight on the cumulative effects on ornithology, and both the other two AoS had a similar constraint. This constraint is not project specific and is an issue for all similarly located sites, and therefore it was considered that this could not be a factor that drove the site selection process.

3.4.3.14 The risk profile of AoS 2 was considered too high for the Salamander Project at the time due to its consistently high depth (>110 m) preventing installation of fixed substation and the uncertainty over a potential O&G tie-back. Given that the Salamander Project had yet to confirm whether a 100 MW or 300 MW capacity project was required, it was necessary to select an AoS that could accommodate both. At this depth floating technology would be required and it was decided that selecting this AoS on the basis that the floating substation technology would become sufficiently advanced within the Salamander Project timeline was too great a risk.

3.4.3.15 AoS 2 could have been a favourable site if a subsea tie-back to nearby O&G assets was feasible, however, given the relatively undeveloped consenting route and the uncertainty of whether a Final Investment Decision (FID) could be made within the Salamander Project timeline, AoS was discarded.

3.4.3.16 AoS 4 was concluded to be very similar to AoS 3. In the end the decision to no longer consider AoS 4 was due to the fact that the Forties Pipeline System (FPS) is located between the AoS and the grid connection point at Peterhead. Further study into the crossing requirements for the FPS was undertaken and it was concluded that crossing this pipeline was too great a project risk. The highly strategic nature of the FPS would have led to a crossing agreement with possibly undesirable liabilities and therefore it was decided to avoid this crossing if at all possible.

3.4.3.17 Following the publication of the INTOG Initial Plan Framework in February 2022 (Marine Scotland (now Marine Directorate), 2022), a decision was made that the Salamander Project would apply for an Exclusivity Agreement as an Innovation project. The location of AoS 3 was then checked and confirmed to be located outside the INTOG lease exclusion areas for Innovation projects (**Figure 3-1**), and therefore was compliant with the leasing round rules (Crown Estate Scotland, 2022).



Salamander

Figure 3-1

Area of Search for Salamander Offshore Array Area

- Area of Search
- ScotWind Leasing Round Sites

Innovation and Targeted Oil & Gas (INTOG)

- Area where projects targeting oil and gas decarbonisation will be considered
- Area where no projects will be considered

Coordinate System: WGS 1984 UTM Zone 30N

Scale @ A3 : 1:1,000,000

0 25 50 Kilometers

0 5 10 20 Nautical Miles

Rev	Description	Date
00	Final Issue	16/04/2024
--	--	--
--	--	--
--	--	--

Doc. Title : Area of Search for Salamander Offshore Array Area
Doc. No :SWF01OR0025
Created by : ES
Checked by : WG
Approved by : MM

SALAMANDER Powered by Ørsted and Simply Blue Group

3.4.4 Offshore Export Cable Corridor and Landfall

3.4.4.1 As part of the route optioneering process for selecting the Offshore Export Cable Corridor (ECC), consideration of likely locations for the Onshore Substation was required. The Salamander Project started with an initial base case that the primary route to market for the electricity produced by the Salamander Project would be through a connection to the national electricity grid.

3.4.4.2 From initial studies of publicly available data a direct connection to the transmission network at the Peterhead Grange substation (just south of Peterhead) provided a potentially suitable connection point.

3.4.4.3 While the baseline route to market for the Salamander Project was (and still is) an export of electricity to the transmission network, several alternatives were also explored, notably connection to a large demand user, the Acorn Hydrogen project, just south of the St Fergus Gas Terminal.

3.4.4.4 Preliminary studies were undertaken to identify potentially suitable cable corridors to facilitate either a connection at Peterhead Grange or St Fergus Gas Terminal.

3.4.4.5 An assessment was undertaken to identify any hard environmental constraints between the AoS and potential Onshore Substation locations and/or grid connection points. These hard constraints constitute any factor which would make offshore export cable installation either impossible or highly unlikely to be consented, with the former representing any physical barriers to cable installation and the latter representing environmental receptors that are highly sensitive to cabling impacts and which may pose a consenting risk.

3.4.4.6 Soft environmental constraints were also identified which include any factors which may increase the consenting risk associated with cable installation, but which are not deemed to present a significant risk to the Salamander Project. This included receptors that are not particularly sensitive to cabling impacts or those where there is a low likelihood of their presence.

3.4.4.7 Both hard and soft constraints were mapped in the Salamander Project's GIS. Hard constraints were avoided as far as technically practicable. Soft constraints were also avoided where possible to minimise consenting risks; if it was not possible to avoid these, the risk was noted.

3.4.4.8 A high-level technical appraisal was also undertaken to identify features which would potentially prohibit cable installation or result in potentially significant technical challenges.

3.4.4.9 The constraints, and approach to constraints considered are presented in **Table 3-5**.

Table 3-5 Constraints used for Offshore Export Cable Corridor identification

Receptor type	Receptor	Constraint type	Corridor constraint approach
Benthic Habitats	Annex 1 Reefs	Hard	Ensure that the corridor route avoids those areas.
Designated Sites	SAC / MPA / SSSI	Hard	Ensure that the corridor route avoids those areas.
Cultural Heritage	Military remains	Hard	Ensure that the corridor route avoids those areas within a 50 m buffer zone.
Cultural Heritage	Wrecks	Hard	Ensure that the corridor route avoids those areas within a 50 m buffer zone.

Receptor type	Receptor	Constraint type	Corridor constraint approach
Ecology - Mammals	Seal breading and haul out sites	Hard	Ensure that the corridor route avoids those areas.
Other Sea Users	Energy infrastructure agreements and designated areas	Hard	Ensure that the corridor route avoids those areas.
Other Sea Users	Oil and Gas infrastructure	Hard	Ensure that the corridor route avoids those areas.
Other Sea Users	UXOs	Hard	Ensure that the corridor route avoids those areas where there are known UXOs, within a buffer zone.
Shipping and Navigation	International Maritime Organisation (IMO) routing lines and areas	Hard	Ensure that the corridor route avoids those areas.
Benthic Habitats	Annex 1 Sandbanks / Pockmarks/ Submarine Structures	Soft	Ensure that the corridor route avoids those areas. If not possible, highlight the consenting risk.
Designated Sites	Special Protection Areas (SPAs)	Soft	Ensure that the corridor route avoids those areas. If not possible, highlight the risk and nature of additional consenting risks.
Fish and Fisheries	Fishing Activity with dredges and bottom trawlers	Soft	Highlight presence of high intensity fishing areas as a consenting risk.
Fish and Fisheries	Spawning grounds	Soft	Highlight spawning grounds of commercially important species as a consenting risk.
Land Use	Land classifications	Soft	Highlight presence of vulnerable classifications.
Other Sea Users	Cables	Soft	Avoid unnecessary cable crossings, highlight unavoidable crossings as additional technical and commercial complexities.
Other Sea Users	Oil and gas (O&G) Pipelines	Soft	Avoid unnecessary pipeline crossings, highlight unavoidable crossings as additional technical and commercial complexities.

Receptor type	Receptor	Constraint type	Corridor constraint approach
Other Sea Users	Power station outflow (specific to Peterhead Grange site)	Soft	Ensure that the corridor route avoids those areas. If not possible, highlight the consenting risk.
Technical	Bathymetry	Soft	If possible, avoid deeper water areas.
Technical	Seabed Slope	Soft	Avoid steep slopes >7 degrees. Highlight as moderate risk from 7-15 degrees and avoid >15 degrees.
Technical	Quaternary Thickness	Soft	Avoid shallow quaternary deposits <5 m depth.
Technical	Seabed Sediments	Soft	Highlight presence of rocks and sandbanks as risk due to installation difficulty.
Technical	Tides	Soft	Highlight presence of strong current and avoid if possible.

3.4.4.10 Based on the routing analysis, three potential cable corridors were identified and have been considered during the site selection process (**Figure 3-2**); these are:

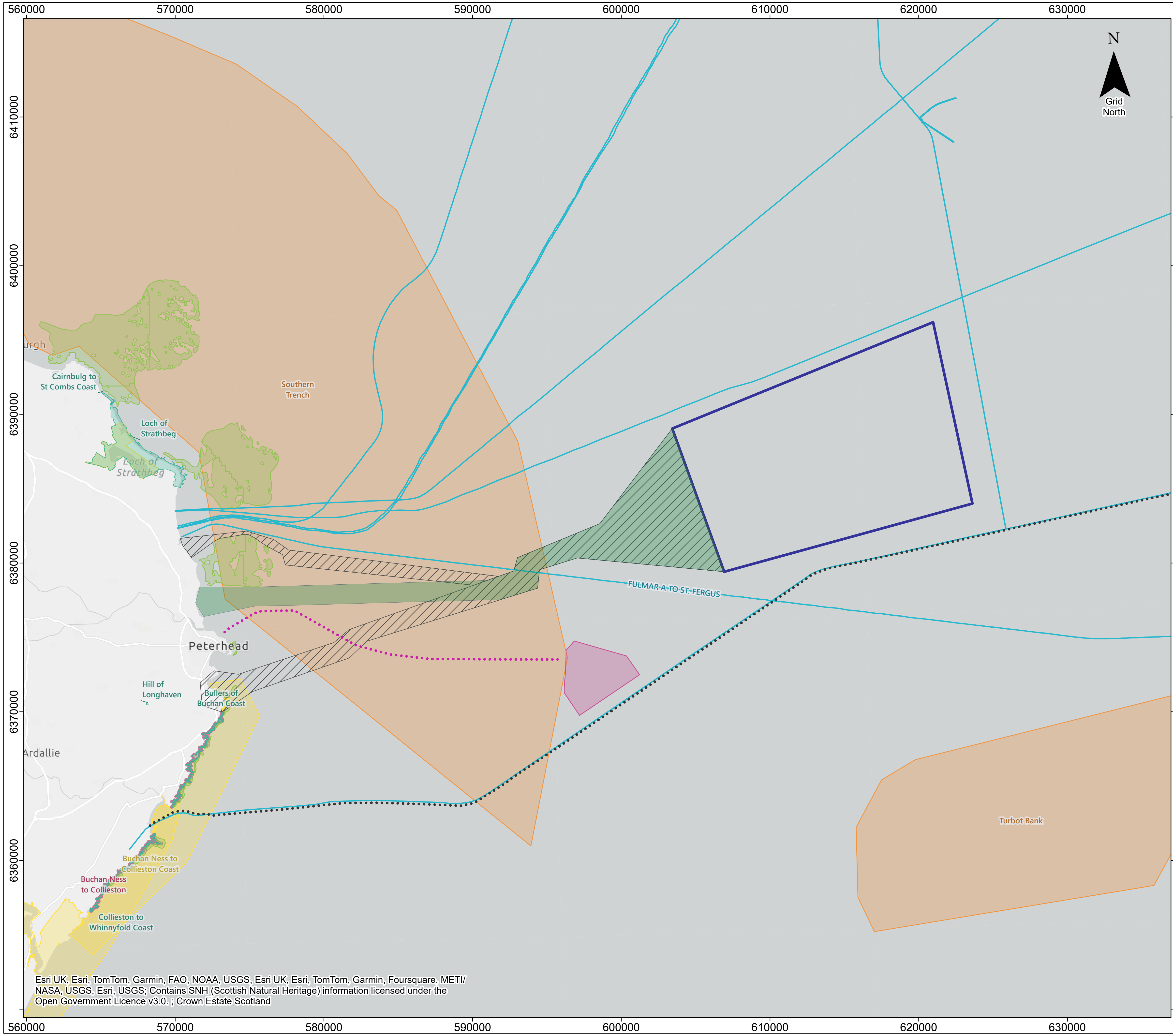
- AoS to Sandford Bay, south of Peterhead;
- AoS to Scotstown Beach, Lunderton; and
- AoS to Scotstown Beach, St Fergus Gas Terminal.

3.4.4.11 However, as the Salamander Project design has progressed and further feasibility assessments and discussions were held with the transmission network operator for the north of Scotland (Scottish and Southern Electricity Networks (SSEN)), two of these options were subsequently ruled out.

3.4.4.12 The export route to Sandford Bay (Option 1, **Figure 3-2**) was discounted as it became apparent that a direct connection from Salamander to the Peterhead substation was not feasible based on available space constraints within the Peterhead substation.

3.4.4.13 The northerly route to the Acorn project at St Fergus Gas Terminal (Option 3, **Figure 3-2**) was ruled out as the small gap between a patch of Annex 1 reef and the active Fulmar to St Fergus gas pipeline is approximately 250 m. Including required space for trenching the export cable, the minimum separation needed between pipeline and cable was considered to be 170 m. The nominal distance from the cable corridor to the Annex 1 reef was therefore approximately 70 m and considered a technical and environmental risk to be avoided.

3.4.4.14 Consequently, the route with a landfall at a point on Scotstown Beach between Lunderton and Kirkton (Option 2), was deemed the only feasible export route for the Salamander Project; this was therefore selected as the preferred Offshore ECC.



Salamander

Figure 3-2

Offshore Export Cable Corridor Optioneering

- Offshore Array Area of Search
- Cable Corridor Area of Search option (preferred)
- Cable Corridor Area of Search options (other)
- Hywind Scotland Pilot Park
- Pipelines (active)

Cables

- Telecom
- Power

Protected Sites

- NCMPA (Nature Conservation Marine Protected Area)
- SSSI (Site of Special Scientific Interest)
- SAC (Special Area of Conservation)
- SPA (Special Protection Area)
- Potential Annex 1 Reef

Coordinate System: WGS 1984 UTM Zone 30N

Scale @ A3 : 1:250,000

0 7.5 15 Kilometers

0 1.75 3.5 7 Nautical Miles

Rev	Description	Date
00	Final Issue	16/04/2024
--	--	--
--	--	--
--	--	--

Doc. Title : Offshore Export Cable Corridor Optioneering
Doc. No : SWF01OR0024
Created by : ES
Checked by : WG
Approved by : MM

SALAMANDER Powered by Ørsted and Simply Blue Group

3.4.5 Refinement of Offshore Development Area

3.4.5.1 Since the announcement of INTOG, refinement of the AoS has been progressed alongside further engagement with some of the stakeholders listed in **Section 3.4.3.6**. This refinement was required in order to align with the maximum size Innovation project (100 MW) permitted through INTOG as well as the minimum density requirement of 3 MW/km^2.

3.4.5.2 The site refinement took a number of technical factors into consideration including energy yield optimization, water depth and wind condition as well as input from the SFF and SWFPA on areas within the AoS that had high intensity fishing levels.

3.4.5.3 As can be seen in **Figure 3-3**, these high intensity fishing areas have been entirely avoided by the area of seabed applied for through the INTOG Leasing Round in November 2022 (which is the same as the Offshore Array Area used throughout this EIAR), thereby minimising impacts to fishermen as far as possible at this stage of site selection.

3.4.5.4 The preferred Offshore ECC (Option 2) was modified in response to the refinement of the Offshore Array Area. As it became apparent that the optimal location for the Offshore Array was in the north-west corner of the AoS, the offshore portion of the preferred Offshore ECC was moved northward so that it was as straight and short as possible and the funnel joining the Offshore ECC to the Offshore Array Area was reduced to align with the refined Offshore Array Area. Based on the criteria used to assess the corridor options, these modifications were not considered significant.

3.4.5.5 The consequence of straightening the route was that the crossing of the Fulmar to St Fergus gas pipeline moved west by approximately 2 km. A further development of the Offshore ECC was to alter the route approximately 12 km from shore to account for the proposed NorthConnect interconnector cable should it be installed ahead of the installation of the Salamander Project's Offshore Export Cable(s). These modifications are included in **Figure 3-4**.

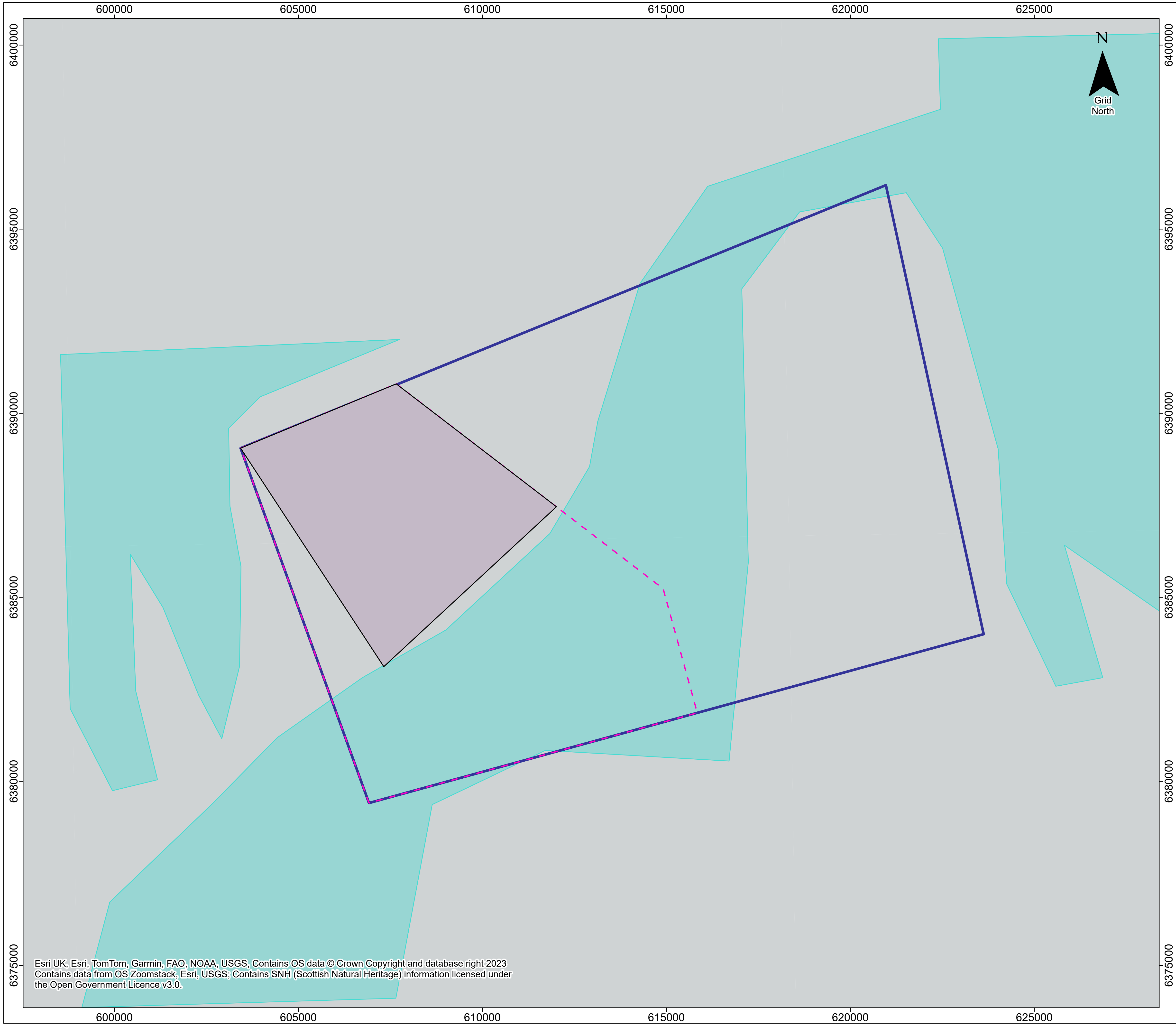
3.4.5.6 As discussed in **Section 3.4.1**, there has been no further site refinement of the Offshore Array Area since that presented at Scoping. However, as the Project Design progresses and the layout of the WTGs is developed based on the data from the geotechnical surveys undertaken in 2023, as well as selection of the specific infrastructure to be installed (e.g. WTGs, floating substructures and mooring/anchor system), the overall footprint of the Offshore Array will likely be smaller than the full Offshore Area Array as it is currently shown. The final site layout will be consulted on post-consent and detailed in the Design Specification and Layout Plan (DSLP).

3.4.5.7 At the time of the AoS selection process the precise route for the NorthConnect cable was not publicly available, and an indicative route taken from a map published on NorthConnect's website was used to inform the constraints analysis; this indicative route crossed the Britannia to St Fergus gas pipeline west of the AoS and consequently had no interaction with the AoS. Since then, the precise route of the NorthConnect cable that has received consent from MD-LOT has become publicly available as the application has now been approved for the Scottish segment of this interconnector. However, there is uncertainty as to whether this project will be going ahead given the Marine Licences are due to expire on 30 October 2024. Adding the approved cable route to the Salamander Project's GIS has shown that it actually does not cross this pipeline but now passes through the north of the Offshore Array Area as shown in **Figure 3-4**. The cumulative impact of this cable and the Offshore Development has been assessed for each relevant receptor within the Cumulative Effects Assessment (CEA) sections of the EIAR chapters, and if the Salamander Project is approved there will ultimately be a requirement for engagement with the developer of the NorthConnect interconnector and development of a proximity agreement between the two parties. Furthermore, there is potential that the proposed Cenos Floating Offshore Windfarm may use part of the consented NorthConnect cable route as their export cable route; this project is currently considering three export cable route options, one of which joins the NorthConnect route northeast of the Offshore Array Area and so would also pass through the north of the Offshore Array Area. Similarly, engagement between the Salamander Project and Cenos Floating Offshore Windfarm will be required and a proximity agreement developed. Further detail is provided in **Volume ER.A.3, Chapter 18: Other Users of the Marine Environment**.

Salamander

Figure 3-3

Offshore Array Area Refinement



Offshore Array Area

Area of Search

Refined Area of Search

High intensity fishing activity

Coordinate System: WGS 1984 UTM Zone 30N

Scale @ A3 : 1:100,000

0 2.5 5 Kilometers

0 0.5 1 2 Nautical Miles

Rev	Description	Date
00	Final Issue	16/04/2024
--	--	--
--	--	--
--	--	--

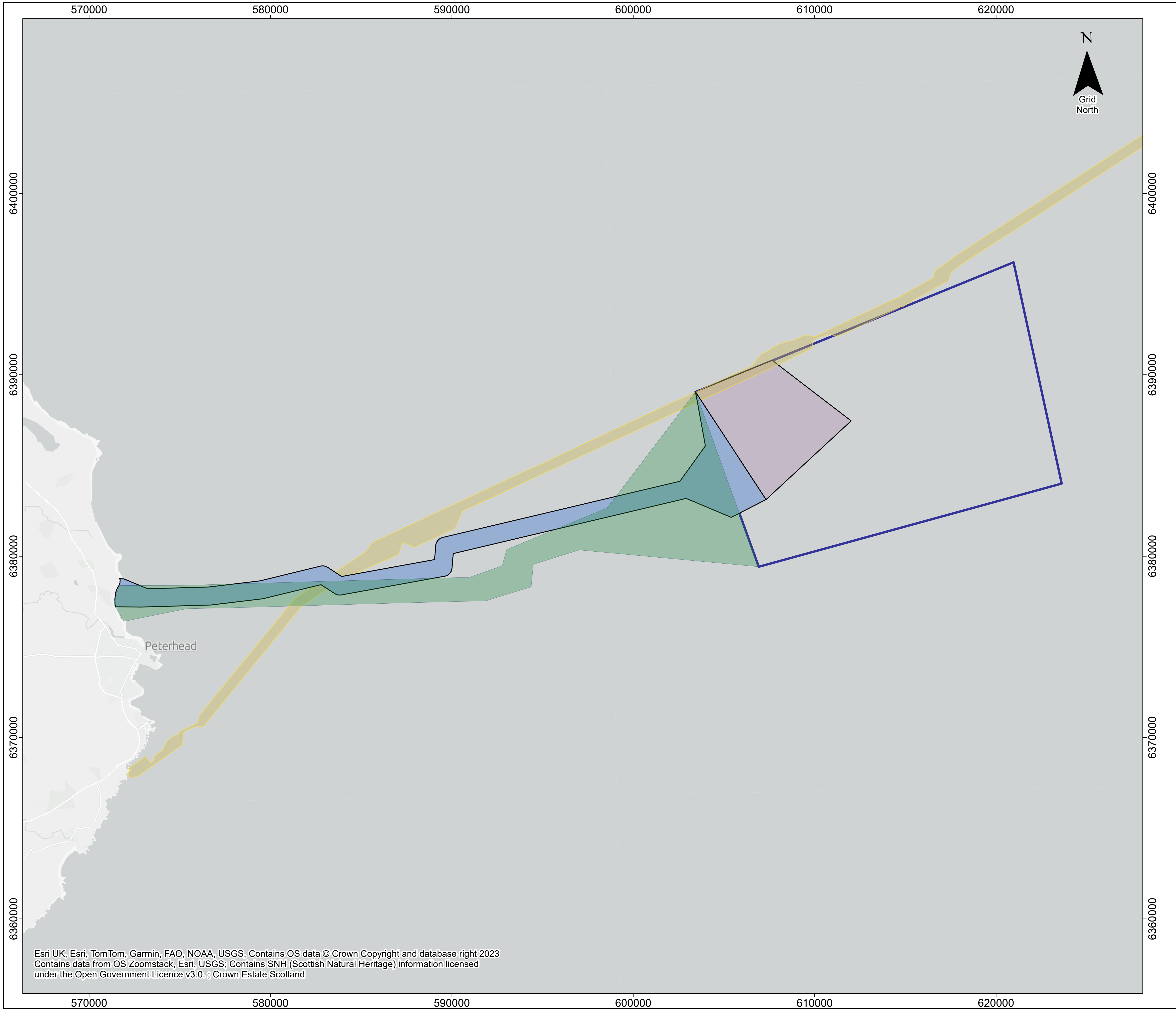
Doc. Title : Offshore Array Area Refinement
Doc. No : SWF01OR0026
Created by : ES
Checked by : WG
Approved by : MM

SALAMANDER Powered by Ørsted and Simply Blue Group

Salamander

Figure 3-4

Offshore Export Cable Corridor Refinement



- Offshore Array Area
- Area of Search
- Offshore Export Cable Corridor
- Cable Corridor Area of Search (Option 2)
- NorthConnect Interconnector

Coordinate System: WGS 1984 UTM Zone 30N

Scale @ A3 : 1:200,000

0 5 10 Kilometers

0 1.25 2.5 5 Nautical Miles

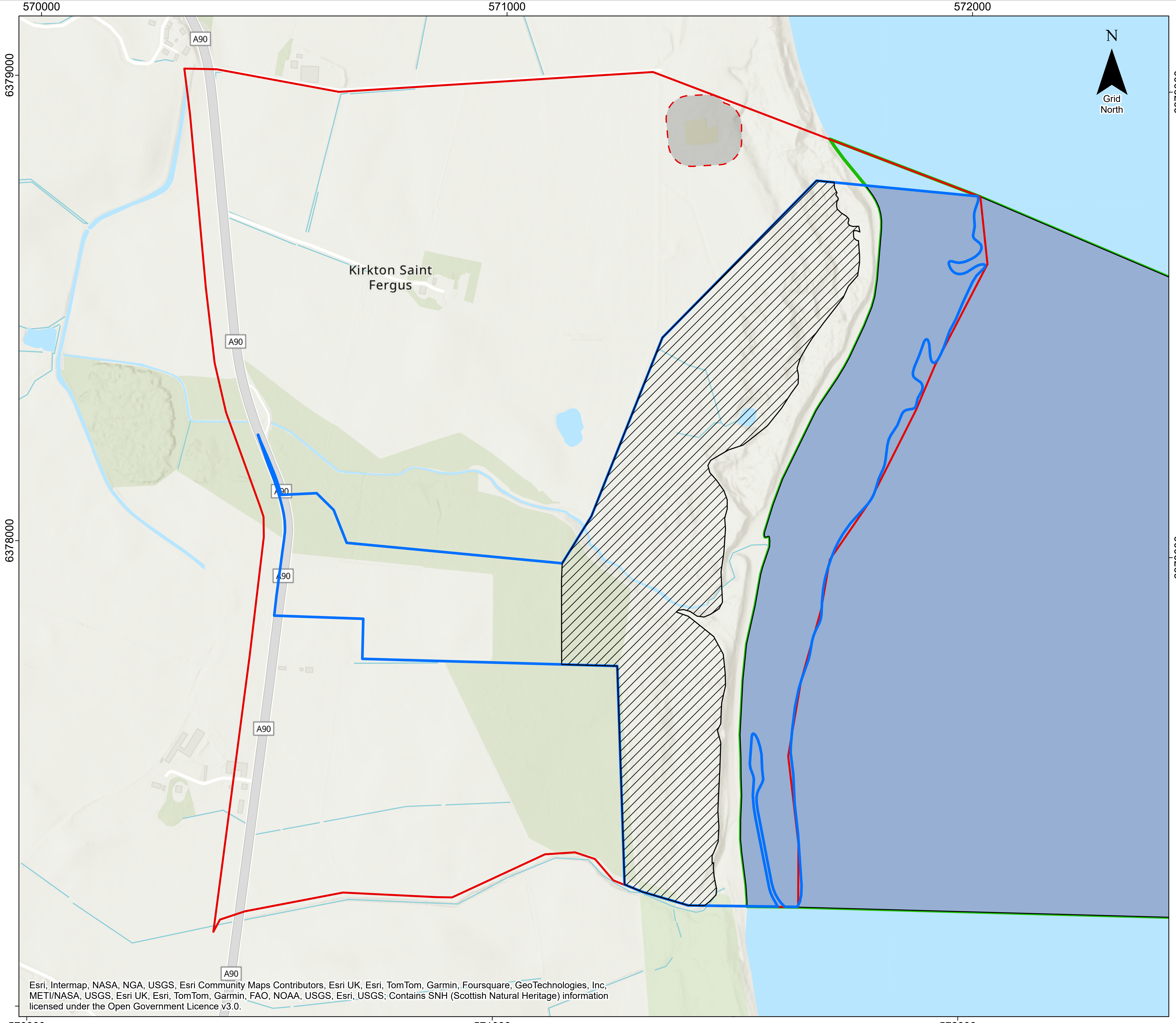
Rev	Description	Date
00	Final Issue	16/04/2024
--	--	--
--	--	--
--	--	--

Doc. Title : Offshore Export Cable Corridor Refinement
Doc. No : SWF01OR0027
Created by : ES
Checked by : WG
Approved by : MM

SALAMANDER Powered by Ørsted and Simply Blue Group

3.4.5.8 As explained in **Section 3.4.1.6**, refinement of the Offshore ECC and location of the Landfall has not progressed significantly since Scoping due to the unavailability of project specific survey data in the Nearshore ECC. Consequently, and as agreed with MD-LOT and key stakeholders in September 2023, the assessment of potential impacts within the relevant topic chapters considers the full extent of the Offshore ECC, using publicly available data for the nearshore section of the ECC and a precautionary approach to assessment, particularly benthic receptors as described within **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology**. The Salamander Project has committed to obtaining the required data for this nearshore region post-consent thereby allowing ground -truthing of the conclusions of the relevant assessments, and subsequently selection of the exact Landfall location.

3.4.5.9 The only minor modification to the Offshore ECC is in the north where it makes landfall, which has been altered slightly so the Landfall AoS avoids the St Fergus Cemetery entirely; this was already excluded from the Onshore Scoping Area originally but further refinement of the indicative Onshore Development Area has enabled the area surrounding the cemetery to be avoided entirely, as seen in **Figure 3-5**.



Salamander

Figure 3-5

Landfall Compound Area of Search Refinement

- Offshore Scoping Area
- Onshore Scoping Area
- St Fergus Cemetery (Area Excluded from Development in Scoping)
- Offshore Export Cable Corridor
- Landfall Compound Area of Search
- Indicative Onshore Development Area

Coordinate System: British National Grid

Scale @ A3 : 1:8,000

0 250 500 Meters

0 0.05 0.1 0.2 Nautical Miles

Rev	Description	Date
00	Final Issue	16/04/2024

Doc. Title : Landfall Area of Search Refinement
Doc. No : SWF01OR0029
Created by : ES
Checked by : WG
Approved by : MM

SALAMANDER Powered by Ørsted and Simply Blue Group

3.5 Consideration of Technical and/or Infrastructure Alternatives for the Offshore Development

3.5.1.1 The Project Design Envelope for the Offshore Development is presented in detail in **Volume ER.A.2, Chapter 4: Project Description.**

Table 3-6 Refinement of Technical Parameters for the Offshore Development

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
Route to Market	Grid connect at Lunderton (Contracts for Difference (CfD))	No change	Export of hydrogen to St Fergus gas terminal for incorporation into the gas network – This option was considered in the early stages of the Salamander Project, prior to submission of the Salamander EIA Scoping Report (SBES, 2023). This option was dropped due to the: • Uncertain demand for hydrogen leading to the risk of not securing a viable route to market; • Significant additional technical risk of developing hydrogen solutions given that the Salamander Project is already incorporating numerous technical innovations; and • Hydrogen being less relevant for the Scotwind projects. Dropping this option meant that an additional hydrogen processing unit, either an offshore floating/fixed platform or larger onshore unit (requiring an area up to 5,000 m^2), was not required. An additional onshore pipeline would also have been required from Landfall to St Fergus. Therefore, removing this option reduced the Salamander Project's overall footprint within the marine and onshore environments. Electricity to O&G platform – This option was dropped partly due to INTOG requirements (an innovation project was not permitted to connect to an O&G platform) and because of the uncertain market. Dropping this option ruled out additional subsea cables that would have been required from the Salamander Onshore Substation to an O&G asset.

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
WTG size and number	Six or seven WTGs	No change	Whilst the exact size, model and capacity of the WTGs has not yet been decided, the parameters presented within the Project Design Envelope will allow the deployment of the most efficient and economical WTGs available on the market at the time of procurement. Notwithstanding this, if a larger turbine was available and selected, this would result in the lower number of WTGs being installed, having subsequent reductions in the number of moorings and anchors to be installed and the total swept area of the turbine blades, and the environmental benefits this would bring to a number of receptors. However, if larger turbines are not available at the time of ordering or suitable for the type of floating foundation selected, then a smaller turbine may still be selected, and to maximise the capacity of the Salamander Project the higher number of turbines would be installed. Decision on WTG size and number will be made post-consent submission during the detailed design stage.
Offshore Array Area and WTG layout	33.25 km^2	No change to Offshore Array Area; layout not defined yet	The Offshore Array Area has been refined a number of times during the site selection process taking into account a range of environmental and engineering considerations and constraints, as described in **Section 3.4.2** and **3.4.5**. However, as discussed in **Section 3.4.5.6**, there has been no change to the Offshore Array Area to that presented at Scoping. The layout of the WTGs has not yet been developed yet though will take into account seabed conditions and optimal wind conditions as well as conforming to Search and Rescue requirements. Different hypothetical layouts have been used as a worst-case for certain topic assessments based on an understanding of the impact pathways for these specific receptors. The Offshore Array layout will be designed to optimise the site for maximum energy yield, but the finalised WTG footprint area[4] is unlikely to cover the whole of the Offshore Array Area, and so the subsequent layout is expected to be less than has been considered as a worst-case within the relevant assessments in the EIAR. Any reduction in total extent of the Offshore Array will

[4] The WTG footprint area comprises the area of sea surface occupied by the infrastructure at or above sea level (i.e. the WTGs and associated floating substructure).

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			result in reduced impacts to benthic ecology, marine mammals, and offshore ornithology and fish receptors, as well as reduced impacts to other sea users, including commercial fisheries and shipping and navigation users, as there is a smaller area over which receptors will be displaced or disturbed. The final layout will be developed post-consent submission through analysis of the geotechnical data, detailed engineering design as well as consultation with relevant stakeholders, and will be presented in the DSLP.
WTG dimensions	Hub Height: ≤ 172.5 m Blade Length: ≤ 125 m Rotor Diameter: ≤ 250 m Blade Tip Height: ≤ 310 m Air gap: ≥ 22 m	Hub Height: ≤ 180 m Blade Length: ≤ 132.5 m Rotor Diameter: ≤ 265 m Blade Tip Height: ≤ 325 m Air gap: No change	In response to a Scoping response from the Met Office that any WTG with blade tips above 310 m in height may impact their weather radar systems, and subsequent consultation with the Met Office, the Salamander Project has committed to ensuring the maximum height of the WTGs in any sea or tidal state is ≤ 310 m. This commitment has been achieved by reducing the maximum hub height and blade length within the Project Design Envelope, thereby reducing tip height and rotor diameter. This has a range of additional environmental benefits on top of allaying the Met Office's concerns; these include: • Reduction in visibility of the Offshore Array for aviation and radar receptors; • Reduction in visibility of the Offshore Array from the coast and other sensitive seascape, landscape and visual receptors; and • Reduction in total swept area of the wind turbine blades, thereby reducing potential for collision risk to ornithological receptors. The Salamander Project team has extensively evaluated feasibility of increasing the air gap between the sea (still water level) and the lowest point of the blade tips as this would lower collision risk for key species such as Kittiwake (*Rissa tridactyla*) and Gannet (*Morus bassanus*). At this point in the Project Design and within the floating substructure options still under

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			consideration, it is not possible to commit to increasing the minimum air gap above 22 m until further key design and procurement decisions have been made. It is not possible for the Salamander Project to commit to an increase to the minimum air gap above 22 m due to the spill over effects on the tower and foundation sizing with significant technical design and supply chain implications. An increase to tower height would introduce design feasibility issues as well as having the potential to significantly limit fabrication options whilst also re-introducing constraints issues associated with radar, aviation and visual impact. Notably the use of a taller tower to place the nacelle farther above the water surface would drive a requirement for a larger foundation. Whilst technically feasible to deliver a suitable foundation design, the more the foundations dimensions are increased, the more difficult it will be to accommodate them in Scottish ports for both assembly and integration. If the foundations become too large, the only possible alternative would be to use ports outside Scotland, which is contrary to one of the fundamental INTOG objectives of the Salamander Project, which is to develop the future local supply chain. In addition to these fundamental issues, a commitment to increased sizing to allow for increased air gap has other consequences that may impact project viability. These implications include: • A reduction in availability of suitable specialised vessels for towing and installation, shore based heavy-lifting cranes and mooring options; • An increase to the mass of entrained carbon in the whole foundation supply chain with no increase in generation capacity; and • Increase in manufacturing and installation costs (e.g. more material, longer process, more complex logistics).

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
Spacing between WTGs	≥ 1,000 m	No change	Whilst consultation with navigational and commercial fisheries stakeholders has indicated that most vessels are likely to avoid the Offshore Array once installed, there was early feedback that WTGs with spacing of less than 800 m may be a concern for some stakeholders. On this basis the Salamander Project committed to spacing of ≥ 1,000 m at Scoping; there has been no change in this commitment.
Floating substructures	Six or seven substructures, either: Semi-submersible / barge Tension Leg Platform (TLP)	No change	As described in the Salamander EIA Scoping Report (SBES, 2023), conventional spar structures are not included in the Project Design Envelope as they are not compatible with the water depths or seabed conditions within the Offshore Array Area with the Salamander Project's intended WTG options. Being a floating offshore wind project (a requirement for an INTOG innovation project), fixed bottom jacket structures were excluded from the project design right at the start. Therefore, at this stage both substructure options (semi-submersible / barge and TLP) that were under consideration at Scoping are still included within the Project Design Envelope. As described at Scoping, there will be one substructure per WTG. If the number of WTGs in the final Project Design Is six then there would be a corresponding six substructures, which would result in less mooring lines and anchors. However, at this stage it is has not been determined which will be the viable WTG option at the point of placing contracts for construction.
Floating substructure dimensions	Semi-submersible / barge Dimensions: 140 x 140 x 49 m Max operational draught: ≤ 24 m Height above water: ≤ 25 m	Semi-submersible / barge Dimensions: 140 x 140 x 50 m Max operational draught: ≤ 20 m Height above water: ≤ 30 m	Apart from a reduction in height of 1 m, the overall dimensions of the semi-submersible / barge have not changed from what was presented at Scoping. However, the operational draught and height above water have been revised based on more up to date technical information for these substructures. This means they may be 4 m lower in the water, so an additional 4 m draught but 5 m less above the water line. This will result in a minor increase in surface area below the sea surface available to invasive non-native species, but this increase is not considered to introduce

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
	<u>TLP</u> Dimensions: 125 x 125 x 65 m Max operational draught: ≤ 40 m Height above water: ≤ 25 m	<u>TLP</u> Dimensions: 140 x 140 x 90 m Max operational draught: ≤ 60 m Height above water: ≤ 30 m	any new impacts or impact any new receptors, so the advice provided within the Scoping Opinion is still considered to be applicable. Impacts as a result of this increased surface area have been fully assessed in **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology** and **Volume ER.A.3, Chapter 10: Fish and Shellfish Ecology**. The dimensions of the TLP have also been refined based on new technical information, though these have reduced both in length/width and height with equivalent reductions in draught and height above sea level.
Mooring system	Configuration: Catenary / semi-taut / taut / tension Number of mooring lines per foundation: 3 – 8 Mooring line radius for catenary / semi-taut / taut: ≤ 1,500 m Mooring line radius for tension: ≤ 125 m	Configuration: Catenary / semi-taut / taut / tension Number of mooring lines per foundation: ≤ 9 Mooring line radius for catenary / semi-taut / taut: ≤ 1,500 m Mooring line radius for tension: ≤ 125 m	As presented at Scoping, all four mooring configurations are still under consideration, including the range of materials (metal chain, metal tendons, wires and/or synthetic fibres) that may make up these systems. The choice of mooring configuration is dependent on a variety of factors such as the specifics of the chosen floating substructure, the anchor type and the seabed and metocean conditions within the Offshore Array Area; therefore this decision will only be made post-application submission. Since Scoping the number of mooring lines has been reduced by at least one line to a maximum of eight. However, depending on the floating substructure selected, detailed analysis of the seabed and metocean conditions and further engineering design, this could be reduced further to as few as three mooring lines, though there may be a requirement to have extra lines to add redundancy in case of failure. Fewer mooring lines (and anchors) will reduce disturbance to the seabed and help reduce disturbance to other sea users and marine ecology receptors. As the design and selection process for the floating substructure, anchor type and mooring system progresses further, it is likely that the worst-case mooring radius assessed in the EIAR (1,500 m) will reduce, especially if the semi-taut or taut mooring system was selected. However,

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			at this stage it is not possible to definitively reduce the spread of the mooring lines from what was presented in the Salamander EIA Scoping Report (SBES, 2023). Any reduction in mooring spread would likely reduce potential interactions with commercial fishermen and other sea users, as well as reducing the area of potential seabed disturbance caused by the moving mooring lines.
Anchors	Type: Drag embedment, vertical load, pile, suction, gravity Number of anchors per substructure: 3 – 8	Type: Drag embedment, vertical load, pile, suction, gravity Number of anchors per substructure: ≤ 9	All anchor types included in the Salamander EIA Scoping Report (SBES, 2023) remain within the Project Design Envelope for the EIAR. The mooring system selected and the seabed conditions within the Offshore Array Area, as well as required holding capacity for the WTGs, will drive the selection of anchor type and it may be that the Salamander Project uses one or a combination of the anchor types listed. Detailed analysis of the geophysical, geotechnical and metocean conditions within the Offshore Array Area will be undertaken post-consent submission to refine the anchor solution. As with the reduction in maximum number of mooring lines from nine to eight, there will also be a reduction of anchors to up to eight; this will be further reduced if the engineering design results in fewer mooring lines being needed. Any reduction in number of anchors will result in less seabed disturbance and also subsequently less scour protection around those anchor types that require it.
Piling	Pile diameter: ≤ 3 m Pile penetration: ≤ 70 m Base case hammer energy: up to 1,500 kilojoules (kJ) for up to four piles per day	Pile diameter: ≤ 2.5 m Pile penetration: ≤ 30 m Hammer energy and number of piles not defined in the Salamander EIA Scoping Report (SBES, 2023)	The maximum pile diameter has increased by 0.5 m from that presented in the Salamander EIA Scoping Report (SBES, 2023) to 3 m. The maximum penetration depth has also increased by 40 m to up to 70 m depth. As further investigations were made into anchoring for TLP floating substructures, the design and requirements for the piling identified the need for potentially longer piles with a slightly larger diameter. Once there is more data available from the geotechnical surveys, such as soil profile, soil parameters, loading regime etc. then pile length /

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
	Hard-driving hammer energy: up to 2,500 kJ for up to one pile per day		diameter can be optimised; the updated values represent a worst-case scenario considered in the EIAR. The hammer energy, duration to drive each pile and the number of piles to be driven per day was not defined in the Salamander EIA Scoping Report (SBES, 2023). However, it was stated that if piling remained in the Project Design Envelope for the EIA (which it has), then Subacoustech's INSPIRE noise propagation model will be used to predict the extent of underwater noise levels relating to pile driving, to determine the thresholds for permanent auditory injury and behavioural disturbance, and at what point these thresholds will be exceeded for both marine mammals and fish receptors. If piles are the selected anchor type, the base case hammer energy to be used on the Salamander Project is up to 1,500 kJ and up to four piles to be installed per day. In the instance of hard-driving being encountered during installation, where a pile is not making sufficient progress with each pile strike, the hammer energy shall be up to 2,500 kJ. Where up to 2,500 kJ is required there will be a 24 hour break in pilling before the next pile is installed. The aim of this project commitment is to ensure that the cumulative sound exposure level, as modelled for stationary fish, stays within acceptable levels for this receptor group. Further detail on piling activities is provided in **Volume ER.A.2, Chapter 4: Project Description** and the assessment of the impact of piling noise on fish and marine mammals can be found in **Volume ER.A.3, Chapter 10: Fish and Shellfish Ecology** and **Volume ER.A.3, Chapter 11: Marine Mammals**.
Inter-array cables	Voltage: High voltage alternating current (HVAC), 66 kV Total length: ≤ 35 km Subsea cable joints: ≤ 16	Voltage: HVAC, ≤ 132 kV Total length: ≤ 20 km Subsea cable joints: ≤ 7	The Salamander Project has decided to use 66 kilovolt (kV) subsea cables, primarily due to the fact that at present a 132 kV cable does not currently exist, and the timelines for a cable of this size to be designed and fully qualified for commercial use is very uncertain. It is considered unlikely that there will be one available by the time the Salamander Project begins the contracting process for long lead items such as subsea cables, so it has been removed from the Project Design Envelope. The result of this decision is that 66 kV cabling will be installed

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
	Cable joint dimensions (w x l x h): ≤ 6 x 2 x 2 m	Cable joint dimensions (w x l x h): ≤ 4 x 2 x 3 m	throughout the Offshore Array Area. The main environmental benefit from this is the reduction in electromagnetic fields (EMF) that will be emitted from the cables, both the dynamic and static cables. The static sections of the inter-array cables will be buried in a trench at a target depth of lowering of at least 0.6 m where technically feasible. Where this minimum depth cannot be achieved, remedial cable protection will be applied as informed by the cable burial risk assessment (CBRA); the burial depth and/or cable protection will reduce the potential effects of the offshore cables. Further detail on predicted EMF levels from the Salamander Project's offshore cables is provided in **Section 4.9.6, Volume ER.A.2, Chapter 4: Project Description**, and assessment of the impacts of EMF on biological receptors are presented in **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology, Volume ER.A.3, Chapter 10: Fish and Shellfish Ecology** and **Volume ER.A.3, Chapter 11: Marine Mammals**. The overall length of all offshore cables remains unchanged at 120 km, however division between that cable referred to as inter-array cable and export cable has changed, with the inter-array cables increasing by 15 km from that presented at Scoping, and the export cables decreasing by an equivalent distance. This will not increase any potential impacts or have a material change in the way the assessments are undertaken in the EIAR. The routeing of the inter-array cables has not yet been finalised as this is dependent on the layout of the WTGs and type of floating substructure selected. The number of subsea cable joints has increased since Scoping, and the dimensions of these joints has also changed slightly; as further investigations were made into the dynamic cabling options for floating wind turbines, the design and requirements for the subsea joints identified scenarios where larger and more numerous joints may be required. However, as these joints are relatively small in size and the installation of scour protection on top of the joints is not expected to create any different or additional potential impacts to the seabed ecology as other seabed infrastructure. Consequently, they have been included in the calculations for total

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			seabed footprint within the Offshore Array Area, and assessed for impacts to benthic ecology within **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology**.
Subsea hub	Number of subsea hubs: ≤ 2 Hub dimensions: ≤ 15 x 15 x 10 m Pile anchor dimensions: ≤ 1.5 x 30 m	No change from Scoping	There has been no change in the maximum number or dimensions of the subsea hub(s) from that presented at Scoping. The subsea hub(s) will be located within the Offshore Array Area, and have been included within each of the relevant receptor impact assessment chapters of this EIAR.
Offshore export cables	Voltage: HVAC, 66 kV Number of export cables: ≤ 2 Total combined length: ≤ 85 km Subsea cable joints: ≤ 4 Cable joint dimensions (w x l x h): ≤ 6 x 2 x 2 m	Voltage: HVAC, ≤ 132 kV Number of export cables: ≤ 2 Total combined length: ≤ 100 km Subsea cable joints / dimensions: Not specified in Salamander EIA Scoping Report (SBES, 2023)	As described above for the inter-array cables, the Salamander Project has decided to progress engineering design based on 66 kV subsea cabling; this includes the offshore export cables. As a result of this decision it is more likely that two export cables will be required to transmit the power generated by the Offshore Array back to shore, whereas if a 132 kV export cable was commercially available only one export cable would have been needed. Consequently, the worst-case design envelope for the export cables presented at Scoping remains unchanged. As described in the inter-array cable section, the combined length of the two offshore export cables has decreased by 15 km from that presented at Scoping, but the total length of all offshore cables to be installed for the Salamander Project is unchanged at up to 120 km. The exact routeing of the offshore export cables has not yet been developed as this will be informed by more detailed engineering, the CBRA, pre-construction surveys and the ultimate Landfall solution and location. It has not been possible for the Salamander Project to complete the geophysical and geotechnical surveys of the nearshore 8 km section of the Offshore Export Cable Corridor. Consequently, the Salamander Project has committed to acquiring this data in sufficient time to analyse, assess and report on any sensitive habitats and/or archaeological receptors that may be encountered in this section. Consultation with the relevant stakeholders will be undertaken on the results of this assessment, with a commitment to micro-routeing to

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			avoid any sensitivities as far as technically possible. Further detail of these assessments is presented in **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology** and **Volume ER.A.3, Chapter 17: Marine Archaeology and Cultural Heritage**. As described in **Section 3.4.4**, the Offshore Export Cable Corridor was selected to minimise the number of crossings of existing cables and pipelines, avoid disposal sites and oil and gas infrastructure, as well as avoiding the potential Annex 1 reef to the north of the Offshore Export Cable Corridor. However, due to the location of the Offshore Array Area and the Landfall location it is not possible for the Offshore Export Cable Corridor to avoid passing through the Southern Trench NCMPA. However, as can be seen in **Figure 3-2**, the route is in the southern part of the MPA and consequently avoids the key benthic features (burrowed mud) that the site is designated for (further detail is provided in **Section 3.7.1** of **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology**). Subsea cable joints for the offshore export cables were not specified in the Salamander EIA Scoping Report (SBES, 2023) however it is envisaged that up to four cable joints will be needed for these cables (up to two in each export cable). However, as with the cable joints within the Offshore Array Area, these are relatively small in size and the installation of these and the subsequent scour protection is not expected to create any different or additional potential impacts to the seabed ecology as other seabed infrastructure. Consequently, they have been included in the calculations for total seabed footprint within the Offshore Export Cable Corridor, and assessed for impacts to benthic ecology within the **Volume ER.A.3, Chapter 9: Benthic and Intertidal Ecology**.
Offshore export cable crossings	Cable/pipeline crossings: ≤ 24	Cable/pipeline crossings: Noted crossings would be needed but number not specified	Whilst the number of crossings of third party infrastructure (cables/pipelines) was not specified in the Salamander EIA Scoping Report (SBES, 2023) it was acknowledged that crossings would be needed. The offshore export cable(s) will need to cross the existing Fulmar to St. Fergus gas pipeline, and it may also be necessary to cross future export cables from other offshore wind

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			projects that are currently in development. Analysis of the proposed cable corridors and areas of search for these offshore wind projects, along with an understanding of the potential construction schedules of the projects suggests that there is potential for up to 24 crossings of third party infrastructure; this is based on the Salamander Project's two offshore export cables and the highest potential number of cables proposed by the other projects. Further detail of the crossings is provided in **Section 4.7.5** of the **Volume ER.A.2, Chapter 4: Project Description**. Crossings of the Fulmar to St. Fergus gas pipeline and the export cables that may potentially be installed in advance of the Salamander Project is unavoidable. Both the third-party asset(s) and the installed Salamander offshore export cable(s) must be protected using a range of protection materials including rocks, rock bags, concrete mattresses or frond mattresses. The design and methodology of these crossings will be confirmed in agreement with the asset owners, and the worst-case design scenario has been considered in terms of number of potential crossings and maximum seabed footprint within the relevant receptor impact assessment chapters.
Landfall	Methodology: Trenchless	Methodology: Trenched and/or trenchless	It has not been possible to refine the Landfall location since Scoping. As described in the Offshore Export Cable Corridor row above, the Salamander Project has been unable to complete the geophysical and geotechnical surveys of the nearshore 8 km section of the Offshore Export Cable Corridor. This lack of nearshore data has prevented full assessment of the landfall options and locations; for this reason the Landfall AoS remains similar to that presented in the Salamander EIA Scoping Report (SBES, 2023). Once the data is obtained (expected to be post-consent), locations and methodologies will be appraised, and a specific location will be decided upon for the onshore Landfall works compound and the consequent location of the exit point of the trenchless landfall solution below the intertidal zone. At the time of Scoping, the Salamander Project was considering both trenched and trenchless methods for the offshore export cable landfall. Since this time, there has been a decision to remove the trenched landfall option within the intertidal area and foredunes from the Project

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			Design Envelope. This decision was not only based on a number of technical and safety reasons such as the challenging dune topography and the risk to dune stability and subsequent safety concerns for the construction crew, but also due to the potential for significant environmental impacts of a trenched solution, as described below: • Trenched methods would lead to significant loss of dune habitat which forms part of the area's designation as the Rattray Head to Peterhead Local Nature Conservation site. The dune grassland is recognised as Annex 1 and afforded protection under the European Habitats Directive. • Due to the potential for future coastal change (shifting dunes, coastal erosion and changing beach levels), there is a potential risk of trenched landfall cables being re-exposed. This concern was raised by NatureScot in their response to the Salamander EIA Scoping Report (SBES, 2023), along with a request to consider engineering solutions that avoid hard engineering/protection of re-exposed cable(s) as this could further exacerbate impacts on coastal morphology. • In accordance with National Planning Framework (NPF) 4, the Salamander Project is required to deliver net positive biodiversity outcomes and will use a quantitative approach to assessment such as the Department for Environment Food & Rural Affairs (Defra) metric[5] for biodiversity net gain. Due to the period of time it would take to reinstate coastal sand dunes (c. 11 years based on the Defra metric tool), the Defra metric would consider this as a habitat loss rather than temporary, which is defined as up to two years. For impacts to sand dune habitats, the Defra metric specifies that the same habitat would require to be compensated for any loss; the

[5] Statutory biodiversity metric tools and guides - https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development

Technical Aspect and Project Design Envelope Parameters		Parameters presented in Scoping Report / Change from Scoping	Alternatives Considered and Environmental Benefits
			only way these can be gained would be for new sand dune creation (which is unrealistic) or enhancement to the of value of existing sand dunes. This would provide a need for enhancement of sand dunes in the application area, but given limited opportunity in the land available to the Applicant, compensation/enhancement measures would need to be made 'off site' with notable challenges to delivery, programme, cost and land considerations. • The Aberdeenshire coastal path, which is a Core Path, crosses the Landfall site through the dunes. Restricting access during construction of trenched methods is considered to result in a potential significant impact to recreational users of the area. These aspects will be assessed in detail in the Onshore EIAR to be submitted as part of the onshore application to Aberdeenshire Council.

3.6 References

Department for Environment Food & Rural Affairs (2024). Statutory biodiversity metric tools and guides - https://www.gov.uk/guidance/biodiversity-metric-calculate-the-biodiversity-net-gain-of-a-project-or-development [Accessed February 2024].

Crown Estate Scotland (2022). INTOG leasing: Offer Document https://www.crownestatescotland.com/sites/default/files/2023-08/intog-offer-document.pdf [Accessed February 2024].

Marine Directorate - Licensing Operations Team (2023). Scoping Opinion for Salamander Offshore Wind Farm. Available online at: https://marine.gov.scot/node/24085 [Accessed February 2024].

Marine Directorate - Licensing Operations Team (2022). Sectoral marine plan - offshore wind for innovation and targeted oil and gas decarbonisation: initial plan framework. Available online at: https://www.gov.scot/publications/initial-plan-framework-sectoral-marine-plan-offshore-wind-innovation-targeted-oil-gas-decarbonisation-intog/ [Accessed February 2024].

Simply Blue Energy (Scotland) Ltd. (SBES) (2023). Salamander Offshore Wind Farm, Environmental Impact Assessment Scoping Report. Available online at: https://marine.gov.scot/sites/default/files/salamander_offshore_wind_farm_-_scoping_report.pdf.