



BERWICK BANK WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Non-Technical Summary

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1. NON-TECHNICAL SUMMARY

1.1. INTRODUCTION

1.1.1. OVERVIEW

1. Berwick Bank Wind Farm Limited (BBWFL) is a wholly owned subsidiary of SSE Renewables Limited and will hereafter be referred to as 'the Applicant'. The Applicant is developing the Berwick Bank Wind Farm (hereafter referred to as 'the Project').
2. The Project is a proposed offshore wind farm located in the outer Firth of Forth and Firth of Tay, approximately 37.8 km east of the Scottish Borders coastline (St. Abb's Head) and 47.6 km to the East Lothian coastline (see Figure 1.1). The Project is comprised of both the offshore and onshore infrastructure required to generate and transmit electricity from the offshore wind farm to a Scottish Power Energy Networks (SPEN) 400 kV Grid Substation located at Branxton, south west of Torness Power station. The offshore export cables will make landfall at Skateraw on the East Lothian coast.
3. The offshore components of the Project (hereafter referred to as the 'Proposed Development') include the offshore wind farm (the wind turbines, their foundations and associated inter-array cabling), together with associated transmission infrastructure including Offshore Substation Platforms (OSPs)/Offshore converter station platforms, their foundations, interconnector cables, offshore export cables and cable protection. A separate application will be submitted to the East Lothian Council (ELC) for the onshore elements of the Project.

1.1.2. PURPOSE OF THIS DOCUMENT

4. This document is a Non-Technical Summary (NTS) of the Environmental Impact Assessment (EIA) Report prepared for the Proposed Development. The Offshore EIA Report provides the environmental information which has been gathered in order to carry out an assessment of the likely significant environmental effects of the Proposed Development.
5. This NTS is intended to act as a stand-alone document that will provide an overview of the environmental effects of the Proposed Development in non-technical language. For more detailed information, the full Offshore EIA Report should be referred to (see volumes 1 to 4 of the Offshore EIA Report).

1.1.3. PURPOSE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

6. The Offshore EIA Report provides a description of the Proposed Development and presents the environmental information which has been gathered in order to carry out an assessment of the likely significant environmental effects of the Proposed Development (seaward of Mean High Water Springs (MHWS)) on the receiving environment.
7. The Offshore EIA Report specifically:
 - provides statutory and non-statutory consultees with technical information to facilitate understanding of the Proposed Development;
 - presents the existing environmental baseline information, established from desktop studies, site-specific surveys and/or consultation;
 - describes the EIA methodology used for the assessments;

- presents the potential environmental impacts arising from the Proposed Development, based on baseline information and data gathered, and the analysis and assessment of likely significant effects, including consideration of cumulative, inter-related and transboundary effects, completed as part of the EIA process;
 - outlines any limitations encountered during the compilation of the environmental information, including where any data gaps or deficiencies exist, and the level of confidence in the information gathered;
 - identifies designed in measures to avoid, prevent, reduce or, where possible, offset any identified significant adverse effects on the environment, and where appropriate, proposed monitoring arrangements to validate findings of the Offshore EIA Report. Where additional mitigation measures have been identified, the residual significance of effect has also been presented; and
 - provides a description of the reasonable alternatives considered for the Proposed Development, and an indication of the main reasons for site-selection.
8. The Offshore EIA Report is divided into four volumes:
 - volume 1 – Introductory Chapters;
 - volume 2 – Offshore EIA Report Technical Assessments;
 - volume 3 – Offshore EIA Technical Reports; and
 - volume 4 – Outline Management Plans.
 9. Based on the Scoping Opinions received and discussions with stakeholders, this Offshore EIA Report focuses on the following topic areas:
 - Physical Processes;
 - Subsea Noise;
 - Benthic Subtidal and Intertidal Ecology;
 - Fish and Shellfish Ecology;
 - Marine Mammals;
 - Offshore and Intertidal Ornithology;
 - Commercial Fisheries;
 - Shipping and Navigation;
 - Aviation, Military and Communications;
 - Seascape, Landscape, Visual Resources;
 - Cultural Heritage;
 - Infrastructure and Other Users;
 - Offshore Socio-Economics and Tourism;
 - Water Quality; and
 - Major Accidents and Natural Disasters.
 10. Based on the Scoping Opinions received and discussions with stakeholders the following topic areas were scoped out of the assessment:
 - Traffic and Transport;
 - Air Quality;
 - Airborne Noise; and
 - Marine Archaeology.
 11. Marine archaeology was scoped out of this assessment; however, a Written Scheme of Investigation (WSI) and a Protocol for Archaeological Discovery (PAD) are included in volume 4, appendix 22.
 12. Throughout the offshore EIA process, the Applicant has undertaken extensive consultation with statutory and non-statutory stakeholders, and actively engaged with the public at Public Consultation Events. Details of the consultation with statutory and non-statutory stakeholders and public consultation events is presented in volume 1, chapter 5, together with a full list of stakeholders who were consulted. Topic specific consultation is also provided in each topic chapter (see volume 2, chapters 7 to 21). A summary of the consultation is presented in section 1.5.

1.1.4. THE APPLICANT

13. The Applicant is a wholly owned subsidiary of SSE Renewables Limited. SSE Renewables Limited is a leading developer, owner and operator of renewable energy across the United Kingdom (UK) and Ireland, with a portfolio of around 4 GW of onshore wind, offshore wind and hydro. Part of the FTSE-listed SSE plc, its strategy is to drive the transition to a net zero future through the world class development, construction and operation of renewable energy assets.
14. SSE Renewables Limited is currently constructing one of the world's largest offshore wind energy project, the 3.6 GW Dogger Bank Wind Farm in the North Sea, which is a joint venture with Equinor and Eni, as well as Scotland's largest and the world's deepest fixed bottom offshore site, the 1.1 GW Seagreen Offshore Wind Farm in the Firth of Forth, a joint venture with Total Energies.
15. When complete, Dogger Bank and Seagreen will help power millions of UK homes and businesses and drive the transition to Net Zero carbon emissions. These assets will join SSE Renewables Limited's existing operational offshore wind portfolio which consists of 487 MW across two offshore joint venture sites, Beatrice and Greater Gabbard, both of which are operated on behalf of asset partners.

1.1.5. PROPOSED DEVELOPMENT OVERVIEW

16. The Proposed Development array area (i.e. the area in which the wind turbines will be located) is approximately 1,010 km² and is located approximately 37.8 km east of the Scottish Borders coastline (St. Abb's Head) and 47.6 km to the East Lothian coastline from the nearest boundary (see Figure 1.1). The Proposed Development's array area overlaps the large-scale morphological banks 'Marr Bank' and 'Berwick Bank'.
17. A maximum of 307 wind turbines will be installed in the Proposed Development array area, with either suction caisson jacket or piled jacket foundations. There will also be up to ten OSPs/Offshore converter station platforms which will also be installed on piled jacket or suction caisson jacket foundations. The wind turbines will connect to each other and to the OSPs/Offshore converter station platforms via subsea inter-array cables, and the OSPs/Offshore converter station platforms will be connected to other OSPs/Offshore converter station platforms via interconnector cables.
18. Up to eight offshore export cables will connect the OSPs/Offshore converter station platforms to the landfall on the East Lothian coast, at Skateraw Harbour (hereafter referred to as the 'Skateraw Landfall'). Once the cables make landfall, they will connect to the onshore substation/converter station, and then onto the grid connection point at Branxton, located south-west of Torness Power Station. This grid connection at Branxton will comprise a new 400 kV substation developed by SPEN.
19. The Applicant has signed an agreement for an additional grid connection at Blyth, Northumberland, referred to as the Cambois connection. Necessary consents for the Cambois connection (including marine licences) will be applied for separately once further development work has been undertaken on this export cable corridor route and landfall. These applications will be supported by an EIA and Habitats Regulations Appraisal (HRA). The Cambois connection has also been included as a cumulative project for the purposes of the Offshore EIA Report and assessed based on the information available at the point of assessment.
20. The construction activities associated with the Proposed Development are anticipated to commence in 2025 and will last for up to 96 months. The decommissioning process is likely to follow a similar programme to construction, in a reverse manner. The Applicant has a 50 year Agreement for Lease (AfL) with Crown Estate Scotland (CES) and therefore, the Applicant is seeking a 35 year consent period to allow the wind farm to continue operating should the lifespan of the wind turbines allow. Further description of the Proposed Development is presented in section 1.3.

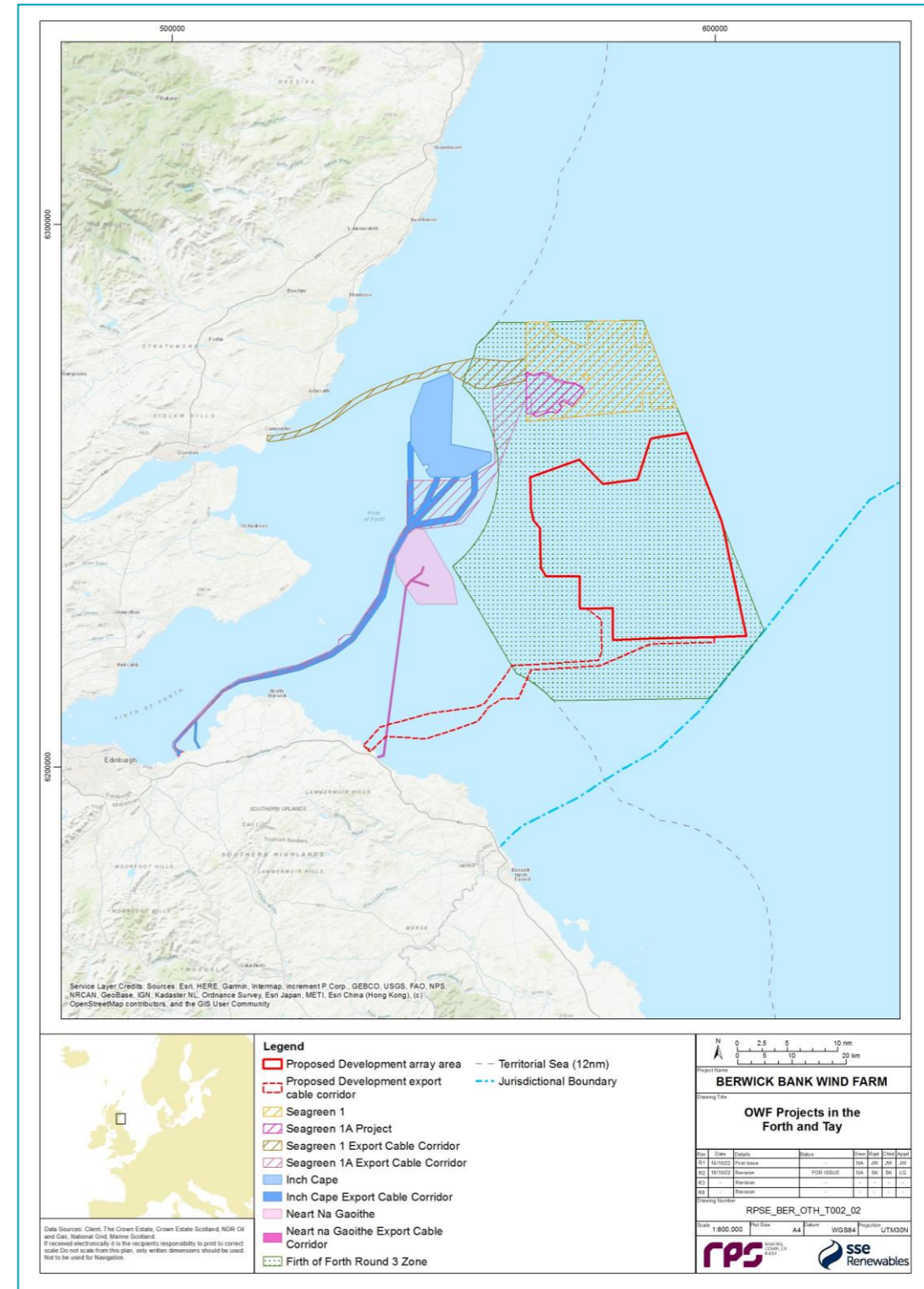


Figure 1.1: Location of Berwick Bank Project and Other Offshore Wind Projects in the Firth of Forth and Tay

1.2. POLICY AND LEGISLATIVE CONTEXT

1.2.1. OVERVIEW

21. This section presents a summary volume 1, chapter 2 which contains the relevant Policy and Legislation context for the Proposed Development specifically in relation to:
- international obligations and policy, including those derived from European legislation, relating to climate change, reducing greenhouse gas (GHG) emissions and the role of renewable energy;
 - UK and Scottish climate change and energy legislation and policy;
 - Scottish offshore wind consenting legislation, including the consent applications required for the construction, operation and maintenance, and decommissioning of the Proposed Development; and
 - other legislation that may be relevant to the Proposed Development.

1.2.2. CLIMATE CHANGE POLICY AND THE NEED FOR THE DEVELOPMENT

International commitments

22. In December 2015, 195 countries adopted the first ever universal, legally binding global climate deal at the Paris climate conference (COP21). The Paris Agreement (2016) sets out a global action plan towards climate neutrality with the aims of stopping the increase in global average temperature to below 2°C above pre-industrial levels, and to pursue efforts to limit global warming to 1.5 C.

European legislation and policy

EU Exit

23. On 31 January 2020, the UK formally left the European Union (EU) after triggering article 50 of the Lisbon Treaty (EU Exit). After leaving the EU, the UK Government has committed, as a minimum, to implement international environmental obligations in accordance with the EU (Withdrawal) Act 2018 and to maintain environmental commitments made and legislation enacted following the departure of the UK from the EU (HM Government, 2018).
24. On this basis, the existing EU renewable energy targets for the UK, including the EU Renewable Energy Directive (RED) 2009/28/EC will remain applicable. However, new EU legislation or updates to existing directives will not be required to be transposed into UK law. The following sections set out the EU renewable energy targets.

UK climate change and energy legislation

The Climate Change Act 2008

25. Under the Climate Change Act 2008, the UK committed to a net reduction in GHG emissions by 2050 of 80% against the 1990 baseline. In June 2019, secondary legislation was passed that extended that target to at least 100% against 1990 baseline by 2050, with Scotland committing to a net zero by 2045. The Climate Change Act 2008 also established the Committee on Climate Change (CCC) which advises the UK government on emissions targets, and reports to Parliament on progress made in reducing GHG emissions. The CCC has produced six four yearly carbon budgets, covering 2008-2037. These carbon

budgets represent a progressive limitation on the total quantity of GHG emissions to be emitted over the five year period.

Climate change

26. In December 2020, the UK Government published the Energy White Paper (HM Government, 2020b), which provides a compelling case for tackling climate change, with a substantial increase of offshore wind capacity as part of the Prime Minister's ten-point plan.
27. The UK submitted its Nationally Determined Contribution (NDC) (HM Government, 2020a) to the United Nations Framework Convention on Climate Change (UNFCCC) under the Paris Agreement in December 2020, covering England, Scotland, Wales and Northern Ireland. The UK's NDC draws on the Clean Growth Strategy (HM Government, 2017), which contains the current policies and measures to decarbonise all sectors of the UK economy through the 2020s and beyond. HM Government (2020c) includes a commitment for a reduction of at least 68% of GHG emissions by 2030 compared to 1990 levels.
28. The programme for Scottish Government 2021-2022, which includes a chapter on how Scotland proposes to end its contribution to climate change, was published in September 2021 (Scottish Government, 2021a). This report considers offshore wind as a key contributor towards this goal. Furthermore, Scotland's Climate Change Plan 2018-2032 was updated in 2020 (Scottish Government, 2020a), listing policies and proposals which contribute towards reducing GHG emissions and meeting Scotland's target for net zero. The Proposed Development is considered to be a key project to help towards the end goal of reducing Scotland's contribution to climate change and achieving net zero within the target dates set out within Government policy.

The Energy Act 2013

29. The Energy Act 2013 makes provisions to incentivise investment in low carbon electricity generation, ensure security of supply, and help the UK meet its emission reduction and renewables targets.
30. The Energy Act contains provisions for Electricity Market Reform (EMR), which sets out the framework for replacing Renewables Obligation Certificates (ROCs) with Contracts for Difference (CfD) to provide stable financial incentives to encourage investment in low carbon electricity generation.
31. CfDs are private contracts between a low carbon electricity generator and the UK Government owned Low Carbon Contracts Company (LCCC). The aim of the CfDs is to give greater certainty and stability of revenues to electricity generators by reducing exposure to volatile wholesale prices, whilst protecting the consumer from paying for higher generation support costs when electricity prices are high (Department for Business, Energy and Industrial Strategy (BEIS), 2021). CfDs aim to support development of renewable energy in the UK by incentivising development.

UK Marine Policy Statement

32. The UK wide Marine Policy Statement (MPS) was published in March 2011 and updated in September 2020, under Section 44 of the Marine and Coastal Access Act (MCAA) 2009, to provide a framework for marine spatial planning, specifically for the preparation of Marine Plans and to ensure that marine resources are used in a sustainable way (HM Government, 2011). The MPS was jointly adopted by Scottish Ministers, the Secretary of State, Welsh Ministers and the Department of the Environment Northern Ireland (DOENI). The MPS confirms that all public authorities, in examining and determining applications for all energy infrastructure, the relevant marine policy statement must be followed, and the following must be considered:

- the national level of need for energy infrastructure;
- the positive wider environmental, societal and economic benefits of low carbon electricity generation;
- that renewable energy resources can only be exploited where the resource exists and where economically feasible; and
- the potential for inward investment on energy related manufacturing and deployment activity and employment opportunities and regeneration of local national economies, supporting the objective of developing the UK's low carbon manufacturing capability.

33. The MPS states that renewable energy offers the potential for significant broad scale environmental benefits through mitigating GHG emissions. When considering potential benefits and adverse effects, decision makers should also consider any cumulative impacts of the proposals with other projects and activities. The MPS also confirms that the level of assessment undertaken for any project should be proportionate to the scale and potential impact of the project, as well as the sensitivity of the environment concerned and in accordance with the EIA Directive, where applicable.

UK Offshore Wind Sector Deal

34. The UK Government published the Offshore Wind Sector Deal in 2019, which sets out the key commitments and actions from the UK Government to support offshore wind energy development (HM Government, 2019). The Sector Deal is divided in terms of ideas, people, infrastructure, business environment and places, laying key commitments for each of these. In relation to infrastructure, it investigates:

- how clean, affordable energy is essential for economic prosperity;
- the need to reduce energy costs for consumers;
- how to deliver up to 30 GW of energy in a sustainable way; and
- the plans for offshore wind energy beyond 2030.

35. In 2020, the UK Government prepared a policy paper to reflect on the status of the offshore wind industry one year after the publication of the Offshore Wind Sector Deal (HM Government, 2020).

Scottish policy and legislation

36. The following policy and legislation documents relate to specifically to Scotland and are listed below to provide a brief guide to further legislation at a Scottish Level

- The Climate Change (Scotland) Act 2009 and Climate Change (Emissions Reduction Targets) (Scotland) Act 2019:
 - introduces binding targets on the Scottish Government to reduce net Scottish GHG emissions by at least 100% by 2045 from 1990 levels;
- The Scottish Energy Strategy: The Future of Energy in Scotland (Scottish Government, 2017):
 - sets out the Scottish Government's vision for the future energy system in Scotland and outlines six priorities around Scotland's 2050 vision which includes renewable and low carbon energy solutions.
- National Planning Framework (NPF) 3 (Scottish Government, 2014a):
 - the long term strategy developed in 2014 by the Scottish Government, which expresses plans for development and investment in infrastructure by the Scottish Government over the next 25 years.
- Scottish Planning Policy (SPP) (Scottish Government, 2014b):
 - supports the NPF 3 and sets out national plans and strategies to provide a vision of how Scotland should evolve in the future.

- The draft NPF 4 (Scottish Government, 2022):
 - currently out for consultation, sets out the approach to planning and development in support of achieving net zero in Scotland by 2045
- Scotland's Offshore Wind Route Map (OWIG, 2010):
 - the Offshore Wind Industry Group (OWIG) (consisting of industry, government, and public sector bodies) published Scotland's Offshore Wind Route Map in 2010 to illustrate the opportunities, challenges and recommendations; and
 - the route map presented recommendations to support offshore wind making a significant contribution to the now superseded target of achieving 80% of Scotland's electricity consumption coming from renewable sources by 2020.

Scottish marine planning policy

37. The Scottish Government has introduced a system of marine planning that covers Scottish offshore waters (12 nm to 200 nm) waters under the MCAA 2009 and territorial waters (within 12 nm) under the Marine (Scotland) Act 2010. Decisions are made based on these Acts and in accordance with the appropriate Marine Plans, which are summarised below.

- Scottish National Marine Plan:
 - the Scottish National Marine Plan (NMP) was adopted in 2015, covering the management of both Scottish inshore waters (within 12 nm) and offshore waters (12 nm to 200 nm); and
 - the NMP "*sets out strategic policies for the sustainable development of Scotland's marine resources and is compatible with the UK MPS and existing Marine Plans across the UK*" (Marine Scotland, 2015).
- Scottish Marine Regions (SMRs):
 - eleven SMRs have been created covering sea areas extending out to 12 nm (the Proposed Development lies within the Forth and Tay SMR).
- Regional Marine Plans (RMP):
 - RMPs are being developed at a regional level within SMRs by Marine Planning Partnerships, to take account of local circumstances and smaller ecosystem units; and
 - at the time of writing (October 2022), there is no RMP in place for the region.
- Sectoral Marine Plan for Offshore Wind Energy:
 - the SMP seeks to contribute to the achievement of Scottish and UK energy and climate change policy objectives and targets, through the provision of a spatial strategy to inform the seabed leasing process for commercial offshore wind energy in Scottish waters.

1.2.3. CONSENTING PROCESS AND ASSOCIATED LEGISLATION

38. This section provides a summary of the consenting process and associated legislative requirements being followed for the Proposed Development.
39. As the Proposed Development is a generating station with a capacity of greater than 50 MW, it requires Section 36 consent under the Electricity Act 1989.
40. The Proposed Development also requires the following:
- a marine licence under the MCAA 2009 for the generating station including wind turbines, foundations and inter-array cables;

- marine licence(s) for the offshore transmission infrastructure (OSPs/Offshore convertor station platforms, interconnector cables and offshore export cables) under the Marine (Scotland) Act 2010 for infrastructure in Scottish inshore waters (0-12nm) and the MCAA 2009 for infrastructure in Scottish offshore waters (12-200 nm); and
- planning permission under the Town and Country Planning (Scotland) Act 1997 for all infrastructure located landward of Mean Low Water Springs (MLWS).

Section 36 Consent

41. As the Proposed Development is an offshore generating station greater than 50 MW capacity and located in the Scottish offshore waters (12 nm to 200 nm) within the Scottish Renewable Energy Zone (REZ), there is a requirement for consent under Section 36 of the Electricity Act 1989. Section 36 will allow for the installation, operation and maintenance of Infrastructure associated with the Proposed Development (see section 1.3 for further details).

Marine licensing

42. The MCAA 2009 applies within the REZ in UK offshore waters (12 nm to 200 nm). Under the MCAA 2009 there is the requirement for a marine licence to be obtained prior to the construction, alteration or improvement of any works or deposit of any object in or over the sea, or on or under the seabed (HM Government, 2009).
43. Similarly, under the Marine (Scotland) Act 2010, which applies to Scottish territorial waters (between 0 nm and 12 nm from MHWS), there is also the requirement for a marine licence prior to the construction, alteration or improvement of any works or deposit any object in or over the sea, or on or under the seabed (HM Government, 2010).

Planning permission

44. Landward of MLWS, works associated with the Proposed Development will require consent under the Town and Country Planning (Scotland) Act 1997. Separate offshore and onshore applications will be made to Marine Scotland and ELC, respectively, the latter being a single application for full planning permission, in accordance with the Town and Country Planning (Scotland) Act 1997. It is currently anticipated that both these applications will be made in 2022.
45. The Applicant is also developing an additional export cable and grid connection to Blyth, Northumberland (hereafter the “Cambois connection”). Applications for the necessary consents (including marine licences) will be applied for separately once further development work has been undertaken on this offshore export cable corridor. The Cambois connection has been assessed as a cumulative project in relation to the Proposed Development. A separate EIA Report will be prepared to support any relevant consent applications that are required to deliver the Cambois connection which will also consider cumulative effects with the Proposed Development.

EIA regulations

46. Under the EIA process, an EIA Report is required to be prepared and submitted to support applications for a Section 36 consent, a marine licence or planning permission relating to offshore renewable energy developments if the proposed activities are likely to have a significant effect on the environment due to factors such as the size, nature or location of the proposal. The purpose of the EIA Regulations is to ensure that any consenting authority gives due consideration to likely significant effects on the environment when considering consenting a proposed project. Due to the size, scale and location of the Proposed Development an EIA is required and an EIA Report has been submitted as part of the section 36 and marine licence applications.

1.2.4. OTHER CONSENTS AND LEGISLATION

Habitats Regulation

47. The Council Directive (92/43/EEC) (the Habitats Directive) was adopted in 1992, providing a means for the EU to meet its obligations under the Bern Convention. The Habitats Directive provides for the conservation of natural habitats and of wild flora and fauna, including offshore waters. This protection is granted through the designation of European sites and European Protected Species (EPS).
48. The European Directive (2009/147/EC) on the conservation of wild birds (The Birds Directive) provides a framework for the conservation and management of wild birds in Europe, including their eggs, nests and habitats.
49. The Habitats Regulations transpose the Habitats and Birds Directives into law in the UK. Under the Habitats Regulations, a network of protected sites for birds and certain habitats and species have been established in the UK. Following EU Exit, the network of sites is collectively known as the Natura 2000 network (where the sites are located within Member State countries) and the National Site Network (or UK site Network¹) where the sites are located within the UK. These sites are hereafter collectively (whether located in the UK or the EU) referred to as ‘European sites’ and include:
- Special Areas of Conservation (SACs) or candidate SACs;
 - Special Protection Areas (SPAs) or proposed SPAs;
 - Sites of Community Importance (SCIs); and
 - Ramsar sites (where also designated as one of the above).

Habitats Regulations Appraisal

50. Where a plan or project is likely to have a significant effect on a European site, regardless of whether the project location is within or beyond the 12 nm boundary, there is a requirement, under the Habitats Regulations for the competent authority (Marine Scotland) to carry out an Appropriate Assessment.
51. The Habitats Regulations require sufficient information to be provided the competent authority to enable it to assess whether there are likely to be any significant effects, and to carry out the Appropriate Assessment (and any subsequent stages of the HRA), where necessary, as part of an HRA. This information and the

¹ The term “national site network” is used in the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017. The two terms refer to the same network of sites ((Scottish Government, 2020).

legislative and policy background to the assessment is provided by the Applicant in the Berwick Bank Wind Farm Report to Inform Appropriate Assessment (RIAA) which accompanies the Offshore EIA Report.

European Protected Species licence

52. EPS are animals and plants (species listed in Annex IV of the Habitats Directive and referred to in the schedules of the Habitats Regulations) that are afforded protection under the Habitats Regulations. All cetacean species (whales, dolphins and porpoise) are EPSs. If any activity is likely to cause disturbance or injury to an EPS, a licence is required to undertake the activity legally.

Energy Act 2004

- Safety Zones:
 - safety zones are intended to ensure the safety of the renewable energy installation or other installations in the vicinity during construction, operation, extension or decommissioning. They may exclude non-project vessels from navigating through a designated area for a designated period.
- Decommissioning:
 - sections 105 to 114 of the Energy Act 2004 (as amended by the Energy Act 2008 and the Scotland Act 2016) (hereafter referred to as the Energy Act) contain statutory requirements in relation to the decommissioning of Offshore Renewable Energy Installations (OREIs) and their related electricity lines; and
 - under the terms of the Energy Act, Scottish Ministers may require a person who is responsible for these installations to prepare (and carry out) a costed decommissioning programme for submission to and approval by Scottish Ministers (Scottish Government, 2019).

Marine Strategy Framework Directive

53. The Marine Strategy Framework Directive (MSFD) requires Member States to prepare national strategies to manage their seas to achieve Good Environmental Status (GES) by 2020.

Water Framework Directive regulations

54. In the UK, coastal waters are protected under the Water Framework Directive (WFD) which requires that *“the project or activity does not cause or contribute to deterioration in water body status or jeopardise the water body achieving good status”* (UK Government, 2016).
55. The European Commission (EC) WFD has become law in Scotland as the Water Environment and Water Services (Scotland) Act 2003. This legislation covers certain activities in coastal waters (3 nm from the limit of the highest tide) (Scottish Environment Protection Agency (SEPA), 2021).

Marine Protected Areas (MPAs)

56. The Marine (Scotland) Act 2010 and the MCAA 2009 introduced provisions to designate and support the management of Nature Conservation (nc) Marine Protected Areas (MPAs). Under section 126 of the MCAA 2009 and section 83 of the Marine (Scotland) Act 2010, Marine Scotland Licencing Operations Team (MS-LOT), as the public authority, is required to consider whether an activity is capable of affecting (other than insignificantly) a protected feature in a ncMPA or any ecological or geomorphological process on which the conservation of any protected feature in a ncMPA is dependant.

Pre-Application Consultation (PAC)

57. Where activity is planned within the Scottish Territorial Waters, the Marine Licensing (Pre-application Consultation) (Scotland) Regulations 2013 (hereafter referred to as the PAC Regulations) apply. There is no provision for PAC in the MCAA 2009, so these requirements do not apply in respect of relevant applications in the Scottish Offshore Region. There are no statutory requirements for consultation during the pre-application stage for Section 36 consent applications, however the principles of the PAC Regulations will be followed for all offshore components of the Proposed Development (below MHWS). The stakeholder engagement and public consultation carried out in relation to the Proposed Development is detailed in section 1.5.

1.3. PROJECT DESCRIPTION

1.3.1. INTRODUCTION

58. This section provides a summary of volume 1, chapter 3, which the description of the offshore components and methodology for the Proposed Development.
59. As described in section 1.1, this Offshore EIA Report has followed the PDE approach, which provides flexibility by assessing the project on the basis of the maximum project design parameters, while ensuring all likely significant effects are assessed within the EIA. Based on this, the Project Description (volume 1, chapter 3) and this summary present the maximum extents of the design as a basis to determine what the likely worst case effects may be, noting that for some technical topics the worst case might be a combination of parameters, not just the maximum parameter, as explained and assessed in volume 2, chapters 7 to 21.

1.3.2. OFFSHORE INFRASTRUCTURE

60. The Proposed Development will be located in the central North Sea, at least 47.6 km offshore of the East Lothian coastline and 37.8 km from the Scottish Borders coastline at St, Abbs. The Proposed Development is already the subject of AfL from CES, and its operational lifetime is assumed to be up to 35 years.
61. The Proposed Development will comprise of the following key offshore components:
 - up to 307 wind turbines (each comprising a tower section, nacelle and three rotor blades) and associated support structures and foundations;
 - up to ten OSPs/Offshore converter station platforms and associated support structures and foundations to accommodate for a combined High Voltage Alternating Current (HVAC)/High Voltage Direct Current (HVDC) transmission system solution or a HVDC solution;
 - a network of inter-array cabling linking the individual wind turbines to each other and to the OSPs/Offshore converter station platforms plus inter-connections between OSPs/Offshore converter station platforms (approximately 1,225 km of inter-array cabling and 94 km of interconnector cabling); and
 - up to eight offshore export cables connecting the OSPs/Offshore converter station platforms to landfall at Skateraw.
62. Figure 1.2 presents an overview of the main offshore components of the Proposed Development.

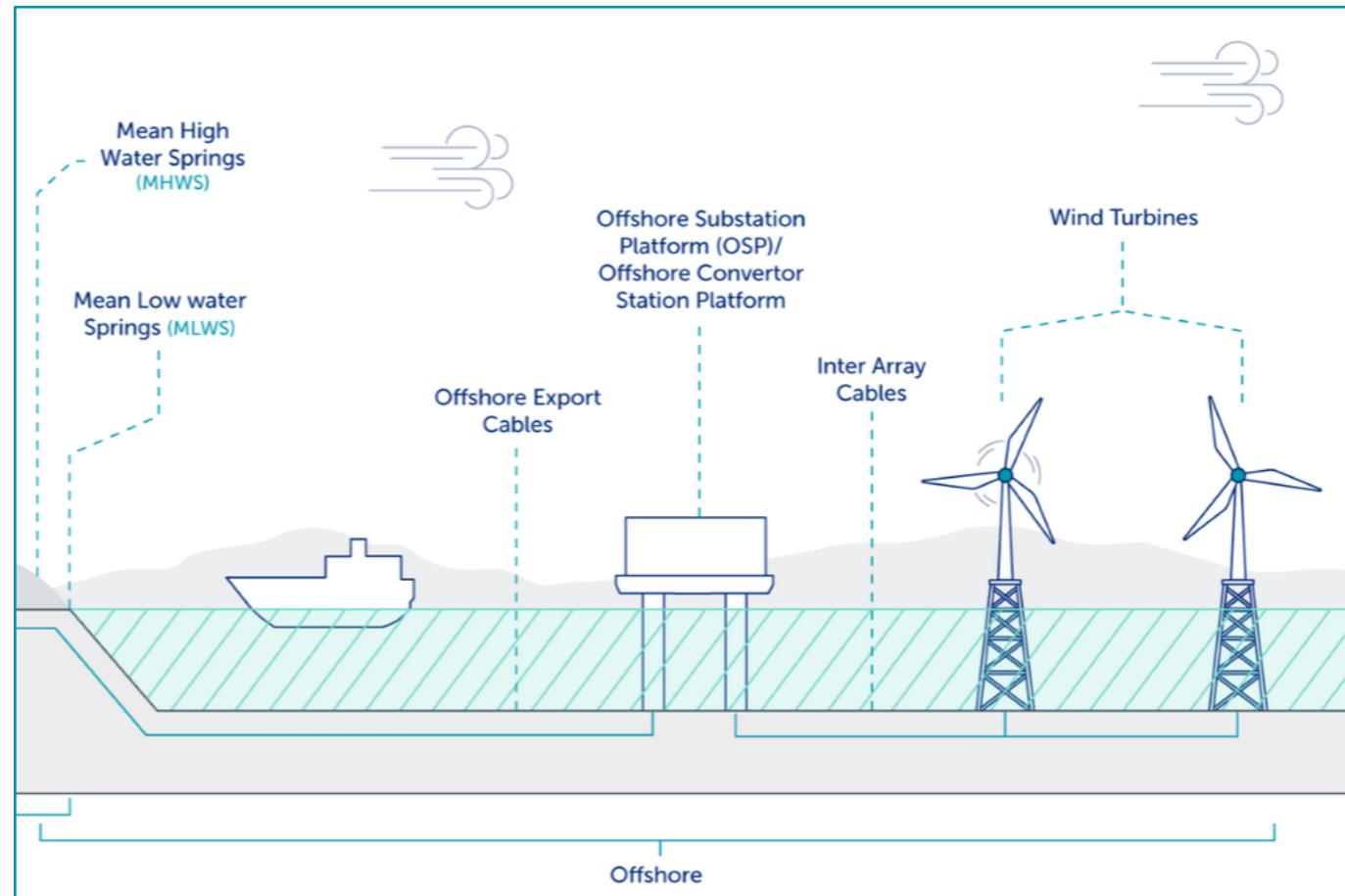


Figure 1.2: Proposed Development Overview

63. Wind turbines will comprise a horizontal axis rotor with three blades connected to the nacelle of the wind turbine. The maximum rotor blade diameter will be no greater than 310 m, with a maximum blade tip height of 355 m above Lowest Astronomical Tide (LAT) and a minimum blade tip clearance of 37 m above LAT. The layout of the wind turbines will be developed to best utilise both the available wind resource, suitability of seabed conditions and wake effects, while seeking to minimise environmental effects and impacts on other marine users (such as fisheries, shipping routes and Search and Rescue (SAR) operations) where possible.
64. The Proposed Development will require up to ten OSPs/Offshore converter station platforms, which transform electricity generated by the wind turbines to a higher voltage and thereby allowing the power to be efficiently transmitted to shore. The size of the platforms' topsides will depend on the final electrical design for the Project but maximums could be up to 100 m (length) by 80 m (width), and up to 80 m in height (above LAT), excluding the helideck, antenna structure or lightning protection. The maximum design parameters for OSPs/Offshore converter station platforms are presented in volume 1, chapter 3. It is proposed that the OSP/Offshore converter station platform foundations will be painted yellow from the water line up to the topside structure and the topside will be painted light grey.
65. Wind turbines and OSPs/Offshore converter station platforms will comprise either piled jacket or suction caisson jacket foundations. The final choice of foundation will depend on ground conditions, wave and tidal

conditions, economic factors and procurement approach. Scour protection will be installed around the foundations to prevent seabed erosion and the development of scour holes. Several forms of scour protection are being considered, which include concrete mattresses, rock placement and artificial fronds.

66. Inter-array cables will carry the electrical current produced by the wind turbines to the OSP/Offshore converter station platforms. It is proposed that up to a maximum of 1,225 km of inter-array cabling will be required for the Proposed Development.
67. Interconnector cables will be required to connect the OSPs/Offshore converter station platforms to each other. The cables are likely to consist of a cross-linked polyethylene (XLPE) insulated aluminium or copper conductor submarine cable.
68. Offshore export cables are used for the transfer of power from the OSPs/Offshore converter station platforms to the transition join bay at landfall (located above MHWS and to be included in the Projects Onshore Planning application) where they become onshore export cables. The offshore export cables will have a maximum total length of 872 km, comprised of up to eight cables connecting the OSPs/Offshore converter station platforms to landfall at Skateraw. Although the Proposed Development export cable corridor has been identified, the exact route of the offshore export cables is yet to be determined and will be based upon geophysical and geotechnical survey information.
69. Cable protection will be used to prevent movement of the cables over the lifetime of the Proposed Development and provide protection to cables when target cable burial depths are not achieved due to seabed conditions. This will protect cables from other activities such as fishing or anchor placement, dropped objects, and limit the effects of heat and/or induced magnetic fields.
70. Up to 16 cable crossings may be required for the offshore export cables. Each of the eight offshore export cables will cross the two Neart na Gaoithe (NnG) Offshore Wind Farm export cables. This will be facilitated by the installation of standard cable crossing designs, likely to be comprised of ducting, concrete mattresses or rock. It is also possible that up to 78 inter-array cable crossings will be required, using measures identified above.

1.3.3. SITE PREPARATION ACTIVITIES

Pre-construction surveys

71. Geophysical and geotechnical surveys will be carried out across the Proposed Development array area and Proposed Development export cable corridor to identify in detail:
- seabed conditions and morphology;
 - presence/absence of any potential obstructions or hazards; and
 - to inform detailed project design work.

Clearance of unexploded ordnance

72. The presence of Unexploded Ordnance (UXO) poses a health and safety risk where it coincides with the planned location of infrastructure and associated vessel activity, and therefore it is necessary to survey for and carefully manage UXOs.
73. Where it is not possible to avoid or relocate a UXO, the preferred method for UXO clearance is for a low order technique. Further information on this is provided in volume 1, chapter 3 and volume 2, chapter 10.

Sand wave and boulder clearance

74. There might be a requirement to remove existing sand waves and similar bedforms within the Proposed Development array area and along the Proposed Development export cable corridor before cables can be installed. Sand wave clearance may take place throughout the construction phase. Further information is provided in volume 1, chapter 3.
75. Boulder clearance is commonly required during offshore wind farm site preparation. A boulder is typically defined as being over 200 mm in diameter/length. Boulder clearance may be required along the inter-array cables, OSP/Offshore convertor station platform interconnector cables and the Proposed Development export cable corridor. It may also be required in the vicinity of the foundation locations (including within the jack-up vessel zone around the foundation locations), in order to avoid disruption to installation activities and to ensure stability for the jack-up vessel. Furthermore, offshore cable routes may be pre-ploughed for the removal of discreet boulders. Should more dense boulder fields be encountered, there may be a need for additional techniques such as the use of boulder grabs. This decision will be informed by the geophysical and pre-construction surveys.

1.3.4. CONSTRUCTION PHASE/METHODOLOGY

76. The Proposed Development is likely to be constructed according to the general sequence below, although the final sequence may vary from this:
- step 1 – offshore export cables – landfall installation using trenchless technology;
 - step 2 – foundation installation and scour protection installation;
 - step 3 – OSP/Offshore convertor station platform topside installation/commissioning;
 - step 4 – inter-array and interconnector cable installation and cable protection installation;
 - step 5 – offshore export cables – offshore installation and cable protection installation; and
 - step 6 – wind turbine installation/commissioning.
77. Various installation vessels will be used during construction of the Proposed Development. This includes main installation vessels (e.g. jack-up barges or dynamic positioning vessels), cargo barges, support vessels, tugs and anchor handlers, cable installation vessels, guard vessels, survey vessels, Crew Transfer Vessels (CTVs), Service Operation Vessels (SOVs), scour/cable protection installation vessels and resupply vessels. In addition, it is possible that helicopters will be used for crew transfers.
78. An indicative construction programme of up to eight years is presented in this Offshore EIA Report. Although construction activities will typically occur sequentially there are expected to be periods where certain construction activities occur concurrently.

1.3.5. OPERATION AND MAINTENANCE PHASE METHODOLOGY

79. It is expected that the Proposed Development will have an operational lifetime of 35 years. The overall operation and maintenance strategy will be finalised once the operation and maintenance base location and technical specification of the Proposed Development are known, including wind turbine type, electrical export option and final project layout.
80. During the operational lifetime of the Proposed Development, regular maintenance activities will be required. Volume 1, chapter 3 provides a description of the foreseeable planned and unplanned maintenance activities.
81. A range of maintenance vessels will be used over the lifetime of the Proposed Development. This includes SOVs and/or CTVs. This will be developed at a later stage once further detail is confirmed for the Proposed Development.

1.3.6. DECOMMISSIONING PHASE METHODOLOGY

82. At the end of the operational lifetime of the Proposed Development, it is anticipated that wind turbine and OSP/Offshore convertor station platform foundations will be cut at below the seabed at an agreed depth and removed. Suction caisson foundations will be fully removed. As the decommissioning programme will be updated during the Project lifespan, it may be decided, closer to the time of decommissioning, that removal will result in greater environmental impacts than leaving offshore components *in situ*.
83. Scour protection and offshore cables will be removed where possible and appropriate to do so. This approach will be reviewed at the time of decommissioning following the most up to date and best available guidance.
84. The decommissioning sequence will generally be the reverse of the construction sequence and involve similar types and numbers of vessels and equipment.

1.3.7. DESIGNED IN MEASURES

85. The PDE includes a number of designed in measures which have been included in the Proposed Development and are committed to be delivered by the Applicant as part of the Proposed Development. The designed in measures for the Proposed Development include a range of measures used to reduce potential impact pathways. For example a key designed in measure is the use of soft start piling procedures in order to reduce impacts to receptors that are sensitive to underwater noise (e.g. marine mammals and some fish species) by allowing receptors in the vicinity to flee the area before noise levels increase to thresholds that may cause injury or mortality. A further key example of a designed in measure is an increased air gap between the lower wind turbine blade tip height and sea surface which reduces the risk of seabird collision impacts (and therefore seabird mortality) as an increased proportion of birds fly below the wind turbine rotor height. For a full description of all designed in measures, they are detailed in volume 1, chapter 3 and also in volume 3, appendix 6.3. Designed in measures that are relevant to specific topics have also been listed in the topic chapters throughout volume 2.

1.4. SITE SELECTION AND CONSIDERATION OF ALTERNATIVES

86. This section presents a summary of volume 2, chapter 4 which outlines the site selection process undertaken and the alternatives considered for the Proposed Development following award of development rights for the Firth of Forth zone in 2010 as part of The Crown Estate Round 3 leasing process.
87. There have been multiple steps undertaken to date including a Zone Appraisal Process (2010 – 2012) and Project Identification and Approval Process (2017 to 2020) which helped identify discrete projects within the Firth of Forth Round 3 Zone. These projects included Seagreen Alpha and Bravo to the north (now known as Seagreen 1 and Seagreen 1A) and Berwick Bank and Marr Bank to the south of the zone.
88. In 2021, Berwick Bank and Marr Bank projects were combined into a single wind farm project (known as 2020 Berwick Bank Wind Farm) which was subject EIA scoping with Marine Scotland Licensing Operations Team (MS-LOT) in 2021 (SSE, 2021a). The combined project included a reduction in the array area (when compared to the combined size of the two projects separately) in order to mitigate possible effects on key receptors including ornithology, as well as refinements of project infrastructure including the removal of wind turbine foundation types (e.g., monopile, gravity and floating), and increasing minimum rotor blade tip height from 22 m to 37 m in order to mitigate collision risk to bird species.
89. In 2022, following stakeholder engagement and receipt of the Scoping Opinion in February 2022 (MS-LOT, 2022) the project was further refined in order to reduce possible effects on key receptors. This included a significant 23% reduction in the size of the Proposed Development array site to mitigate possible effects on key receptors including ornithology, the Firth of Forth Banks Complex nCMPA, shipping and navigation,

and commercial fishing. Further details of the project refinements are included in volume 2, chapter 4. Following the award of two grid connection offers at Branxton, East Lothian, a Strategic Landfall Assessment was undertaken to identify preferred locations for bringing the offshore export cables ashore. Locations were identified based upon their suitability for connecting to potential onshore substation locations including environmental constraints and engineering feasibility. In parallel to the landfall and onshore substation optioneering studies, Proposed Development export cable corridor refinement studies were also undertaken. These were informed by offshore surveys including geophysical surveys.

90. Upon submission of the Offshore Scoping Report (SSE, 2021a) only two landfall locations remained: sites at Thorntonloch and Skateraw, along with two landfall methodologies (trenchless and open trench). Post receipt of the Scoping Opinion (MS-LOT, 2022) the Proposed Development was refined so that only one landfall location (Skateraw) and one landfall methodology (trenchless) remain.

1.5. STAKEHOLDER ENGAGEMENT AND CONSULTATION

1.5.1. INTRODUCTION

91. This section presents a summary of volume 1, chapter 5 which contains information regarding stakeholder engagement and consultation undertaken during the pre-Application stage of the Offshore EIA Report relevant to the Proposed Development, which in conjunction with the PAC report, provides a record of the stakeholder and public engagement.
92. In particular, the stakeholder engagement and consultation Offshore EIA Report chapter summarises:
- the approach taken to consultation by the Applicant during the pre-Application stage for the Berwick Bank offshore wind farm;
 - informal and formal stakeholder engagement undertaken;
 - key feedback received during the pre-Application phase; and
 - the stakeholder engagement processes applied to the pre-Application stage.
93. A separate report detailing the PAC process provides further detail of consultation undertaken and is provided as an accompanying report to this Offshore EIA Report. In addition, the PAC report provides a summary of views raised and response provided by the Applicant dating back to November 2020.

1.5.2. GOOD PRACTICE IN PUBLIC ENGAGEMENT

94. The Applicant has sought to follow good practice throughout pre-Application consultation on the Proposed Development, including complying with advice from MS-LOT on continued engagement throughout pre-Application processes.
95. The Applicant has reviewed and considered all feedback provided as part of stakeholder consultation in the pre-application, which is documented in the following reports:
- volume 1, chapter 5: Stakeholder Engagement and Consultation;
 - PAC Report (onshore and offshore) (SSER, 2022d);
 - volume 3, appendix 8.2: Benthic Ecology, Fish and Shellfish Ecology and Physical Processes Road Map;
 - volume 3, appendix 10.3: Marine Mammals Road Map;
 - volume 3, appendix 11.8: Offshore Ornithology Road Map;
 - volume 3, appendix 13.2: Shipping and Navigation Road Map; and
 - volume 3, appendix 5.1: Audit Document of Post-Scoping Discussions which summarises key points discussed between the Applicant and MS-LOT/NatureScot post-Scoping Report (SSER, 2021a).

96. Additionally, ongoing consultation has been undertaken with various commercial fisheries stakeholders including Scottish Fishermen's Federation (SFF), North East Regional Inshore Fisheries Group (NERIFG), and the Under 10 m Association and local Fisheries Industry Representative (FIRs).
97. The approach to consultation for the Proposed Development has followed the Gunning Principles of "fair and worthwhile" consultation, of which the rules include that consultation:
- must be at a time when proposals are still at a formative stage;
 - the proposer must give sufficient reasons for any proposal to permit of intelligent consideration and response;
 - adequate time is given for consideration and response; and
 - the product of consultation is conscientiously taken into account when finalising the decision.
98. Public participation is a key element of any major infrastructure project and the Applicant is committed to stakeholder engagement at all stages of the Proposed Development.

1.5.3. PUBLIC ENGAGEMENT

99. Key groups of public stakeholders have been engaged throughout the pre-Application phase of the Proposed Development, as follows:
- Strategic Engagement: Engagement focussed on local and national Government bodies including local authority councillors;
 - National Engagement: Engagement focussed on statutory stakeholders and non-statutory bodies with particular interest in offshore activity; and
 - Local Engagement: Engagement focussed on local organisations, local communities and members of the Public.

Pre-application consultation

100. Public consultation for the Project during the pre-Application phase took place during COVID-19 pandemic restrictions, therefore, by necessity, some public exhibitions and consultation events were held online only. The Applicant ran 13 virtual events and 17 in-person events (which followed the Scottish Government's guidance), seeking to ensure feedback was received from as diverse a range of public groups as possible. For further detail on the approach to formal consultation events and the outcomes of these events please see the Project PAC Report (SSER, 2022d).

Community engagement

101. A dedicated Stakeholder Engagement Manager (SEM) has been in place from the commencement of development of the Proposed Development, to facilitate and support engagement with the community. In addition to formal consultation events, The SEM carried out local engagement with public, community councils, businesses and local organisations in the form of virtual and in person meetings, and also maintains a mailing list to disseminate information to members of the public who have voluntarily provided their contact information (email).

Information provision and awareness raising

102. Throughout the pre-application process, the Applicant has sought to engage with stakeholders, including members of the public, through provision of information. Information has been communicated through a variety of channels as outlined below:

- Fisheries Liaison Officer (FLO): the FLO has fisheries expertise acts as the primary point of contact for liaison with the fishing industry on behalf of the applicant, and has the delegated authority to fully represent the Applicant on fisheries related issues;
- Project website: a dedicated project website is hosted by the Applicant and can be found here www.berwickbank.com;
- Email address: A dedicated email address has been administered throughout the pre-application phase at: berwickbank@sse.com; and
- Local news: Consultation events were advertised in the Courier, East Lothian Courier, St Andrew's Citizen and Berwickshire News.

103. The Applicant have also provided digital versions of key documentation to allow easy access and user flexibility. Digital documentation provided includes:

- Digital Offshore EIA Scoping Report;
- Digital Offshore Likely Significant Effect (LSE) Screening Report;
- Digital Offshore EIA Report; and
- Digital Offshore RIAA.

1.5.4. STAKEHOLDER ENGAGEMENT

104. Offshore EIA scoping has been undertaken as part of the pre-application phase for the Proposed Development. Two scoping reports were produced in August 2020 (SSER, 2020) and October 2021 (SSER, 2021a). The two scoping opinions were received in March 2021 (MS-LOT, 2021) and February 2022 (MS-LOT, 2022).

105. A thorough statutory and non-statutory stakeholder engagement process has been undertaken by the Applicant, supported by their consultants. Due to COVID-19 pandemic restriction in 2020, 2021 and early 2022, all statutory stakeholder engagement has taken place virtually. For some topics, a "Road Map" processes of engagement was undertaken. These topics were:

- benthic subtidal and intertidal ecology, fish and shellfish ecology and physical processes;
- marine mammals;
- ornithology; and
- shipping and navigation.

106. The list of organisations that were approached/consulted during the pre-Application process (including Scoping and LSE screening) for the Proposed Development can be found in volume 1, chapter 5, and Organisations that attended the Road Map Meetings are detailed in volume 3, appendix 8.2, appendix 10.3, appendix 11.8 and, appendix 13.2.

1.5.5. FEEDBACK AND REPORTING

107. All feedback received throughout the pre-Application consultation phase was recorded and collated by the Applicant, supported by their consultants. Feedback received relating to the Proposed Development technical chapters has been addressed in topic chapters and appendices. Stakeholders provided feedback as part of EIA scoping and LSE screening, and during post-scoping discussions. An Audit Document for Post-Scoping Discussions has been requested by MS-LOT and is presented in volume 3, appendix 5.1. The Applicant has reviewed and had regard to all feedback received throughout the pre-application process.

1.6. ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

108. This section outlines the EIA methodology used for the assessment of likely significant effects associated with the Proposed Development on physical, biological and human environment receptors. Section 1.6.1 describes the key principles followed during the EIA process and the approach taken as part of this Offshore EIA Report.

109. This Offshore EIA Report has been prepared in accordance with the EIA Regulations and relevant policy and legislation as described in section 1.2.

1.6.1. KEY PRINCIPLES OF THE ASSESSMENT

Overview

110. The EIA methodology used in this Offshore EIA Report has been included as a separate chapter (volume 1, chapter 6). In addition, the following is included in each topic chapter:

- identification of the study area for the topic specific assessments;
- description of topic specific legislation, policy and guidance;
- summary of consultation carried out for the Proposed Development;
- description of the environmental baseline conditions, including future baseline;
- presentation of the assessment of likely significant effects;
- presentation of the Cumulative Effects Assessment (CEA)
- presentation of the transboundary effects; and
- presentation of the inter-related effects.

111. The following sections describe the approach taken as part of the offshore EIA process in more detail.

Project Design Envelope

Maximum design scenario

112. The PDE approach has been adopted for the assessment of the Proposed Development, in accordance with current best practice and the "Rochdale Envelope Principle". This requires the assessment of likely significant effects of the realistic 'worst case' parameters of the Proposed Development.

113. This approach has been taken for this Offshore EIA Report due to the lack of precise final design details of the Proposed Development at the time of writing this report. The PDE parameters and range of potential project design values for relevant offshore components of the Proposed Development is included as part of the Project Description chapter (volume 1, chapter 3).

114. For each of the topic chapters within this Offshore EIA Report and for each of the effects assessed, the PDE considered will be the scenario which would give rise to the greatest potential effect (referred to as the maximum design scenario). By identifying the maximum design scenario, it can therefore be concluded that the impact (and therefore the effect) will be no greater for any other design scenario than that assessed for the maximum design scenario.

Designed in measures

- 115. Primary and tertiary mitigation has been referred to as designed in measures in this Offshore EIA Report. These include those measures which have been incorporated within the design of the Proposed Development.
- 116. These include standard measures applied to offshore wind development, including the use of “soft starts” for piling operations or lighting and marking of the Proposed Development. Designed in measures have been described within the topic chapters.

Secondary mitigation measures

- 117. Secondary mitigation is considered as additional measures which are applied after the assessment process has been completed to prevent, reduce and offset LSEs which could not be avoided through designed in measures.

Identification of impacts and significance of effect

- 118. The Proposed Development has the potential to create a range of impacts and effects with regards to the physical, biological and human environment, for both coastal and marine receptors.
- 119. For the purposes of the Offshore EIA Report, the term ‘impact’ is defined as a change that is caused by an action. For example, the laying of an inter-array cable (action) is likely to result in seabed disturbance (impact). Impacts can be defined as direct, indirect, temporary, irreversible, secondary, cumulative and inter-related. They can also be either positive or negative, although the relationship between them is not always straightforward and relies on available evidence and professional judgement.
- 120. The term ‘effect’ is defined as the consequence of an impact. For example, following the inter-array cable laying example described in paragraph 119 the laying of an inter-array cable (action) results in seabed disturbance (impact), with the potential to disturb benthic habitats and species (effect).
- 121. The overall significance of an effect is determined through the correlation of the magnitude of impact alongside the sensitivity of the receptor. To ensure consistency in defining the significance of an effect, a matrix approach has been adopted, as presented in Table 1.1. In cases where a range is suggested for the significance of effect, there remains the possibility that this may span the significance threshold (i.e. the range is given as minor to moderate). In such cases the final significance is based upon the expert’s professional judgement as to which outcome delineates the most likely effect, with an explanation as to why this is the case.

Table 1.1: Matrix Typically Used for the Assessment of the Significance of the Effect

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity of Receptor	Negligible	Negligible	Negligible to Minor	Negligible to Minor	Minor
	Low	Negligible to Minor	Negligible to Minor	Minor	Minor to Moderate
	Medium	Negligible to Minor	Minor	Moderate	Moderate to Major
	High	Minor	Minor to Moderate	Moderate to Major	Major
	Very High	Minor	Moderate to Major	Major	Major

- 122. The standard approach for the purposes of this assessment:
 - a level of significance of effect of moderate or more will be considered a ‘significant’ effect in terms of the EIA Regulations; and
 - a level of significance of effect of minor or less will be considered ‘not significant’ in terms of the EIA Regulations.
- 123. Some topic chapters in Volume 2 of the EIAR use alternative EIA methods including specific topic-based guidance/assessments and alternative significance matrices; these are discussed and made clear in the relevant topic chapters.
- 124. As part of the topic assessment, further mitigation measures have been identified after the assessment of significance as required. Following this, the assessment re-evaluates the significance of effect using the methodology previously described.

Cumulative Effects Assessment

- 125. The CEA considers the impacts arising from the Proposed Development cumulatively with other relevant plans, projects and activities. Cumulative effects are therefore the combined effect of the Proposed Development with the effects from a number of different plans, projects and activities, on the same receptor group or resource.
- 126. An assessment of cumulative effects is required in accordance with the EIA Directive and the EIA Regulations. The EIA Directive (Annex IV, Article 5e) states that “A description of the likely significant effects of the project on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”.
- 127. A process has been followed for the screening of plans, projects and activities that may be considered in the CEA alongside the Proposed Development (volume 3, appendix 6.4). This process involved a screening stage, which identified those foreseeable developments or activities with which the Proposed Development may interact to result in cumulative effects.
- 128. After the screening, a list of all projects, plans and activities screened in for assessment was produced for each topic and a tiered approach was adopted to complete the CEA. The tiers can be described as:
 - tier 1 - Proposed Development (Berwick Bank Wind Farm offshore) with Berwick Bank Wind Farm onshore;
 - tier 2 – All plans/projects assessed under Tier 1, plus projects which became operational since baseline characterisation, those under construction, and those with consent and submitted but not yet determined;
 - tier 3 – All plans/projects assessed under Tier 2, plus those projects with a Scoping Report; and
 - tier 4 – All plans/projects assessed under Tier 3, which are reasonably foreseeable, plus those projects likely to come forward where an Agreement for Lease (AfL) has been granted.
- 129. The CEA follows the EIA Methodology (volume 1, chapter 6) as far as practicable to ensure consistency of approach, although this approach may differ between topic chapters. Where the approach has deviated from that set out in EIA Methodology chapter, this is made clear in the chapter and will be a result, for example, of the nature of the topic or data available for each topic or project, plan or activity. As such, some topics have completed the CEA employing full quantitative, a mix of qualitative and quantitative or full qualitative assessment.

Transboundary effects

130. The potential for transboundary effects to arise is a result of an impact from the Proposed Development which has the potential to significantly affect the environment of a European Economic Area (EEA) state(s). Full description of how the transboundary effects assessment has been carried out is found in a standalone appendix (volume 3, appendix 6.6).
131. To assist with this process, a screening exercise for potential transboundary impacts was undertaken at the scoping stage and presented in the Berwick Bank Wind Farm Offshore Scoping Report (SSER, 2021a). This exercise identified that the following receptors may experience transboundary impacts from the Proposed Development:
- fish and shellfish ecology;
 - marine mammals;
 - offshore and intertidal ornithology;
 - commercial fisheries;
 - shipping and navigation; and
 - offshore socio-economic and tourism.
132. Each of the above topic chapters provides an assessment of transboundary effects for each receptor group, which also considers the inter-relationships between effects, as described in paragraph 133 *et seq.*

Inter-related effects

133. The EIA Regulations require consideration of the inter-relationships between EIA topics that may lead to environmental effects. For example, the separate impacts of noise and habitat loss may have an effect upon a single receptor group such as fish and shellfish or marine mammals.
134. The assessment of potential inter-related effects has been carried out concurrently considering two levels of potential effect:
- project lifetime effects: effects that occur throughout more than one phase of the project (construction, operational and decommissioning) interacting to potentially create a more significant effect upon a receptor than if just assessed in isolation in a single phase; and
 - receptor led effects: effects that interact spatially and/or temporally resulting in inter-related effects upon a single receptor. For example, the effect of underwater noise on marine mammals may be greater when multiple sources of impact interact or combine to produce a different or greater effect upon this receptor than when single sources of impact are considered in isolation, or where potential impacts on a key prey resource (e.g. sandeels from multiple impact pathways such as habitat disturbance and underwater noise impacts), results in a greater impact on the receptor species than one impact pathway alone. Receptor led effects might be short term, temporary or transient effects, or incorporate longer term effects.
135. Further detail on the approach and methodology for the assessment of inter-related effects associated with the Proposed Development is provided in volume 2, chapter 20).

1.7. PHYSICAL PROCESSES

136. Physical processes refer to the coastal and marine processes and the relationship with the physical environment and includes tidal currents, wave climate and sediment transport regime. The physical processes of the Proposed Development were numerically modelled using datasets collected from a series of site-specific bathymetric surveys, including grab sampling and a detailed desktop review of existing studies and datasets.

137. The geophysical survey carried out by Fugro (2020) indicated that the seabed within the Proposed Development array area is comprised of a dynamic landscape with varied seafloor morphology categorised into four types of features such as large-scale banks, arcuate ridges, incised valleys and bedforms. The geophysical surveys carried out by both Fugro (2020) and XOCAN (2021) within the Proposed Development export cable corridor shows it to also be a variable landscape primarily characterised as boulder fields and bedforms. The seabed sediments present in the Proposed Development array area are classified as mixed sediments, coarse gravel, shelly gravelly sand with boulders, mixed sediment with patchy coarse material or boulders and muddy sand. The seabed of the Proposed Development export cable corridor is comprised of coarse sediment with cobbles, boulders, outcrops etc. with areas of coarse sediments (gravel) and sandy sediments (muddy and fine sand). Geophysical data from the Proposed Development array area highlights two morphological bank features, Marr Banks and northern extent of the Berwick Bank part of the Firth of Forth Banks Complex ncMPA. Within the Proposed Development array area, the water depth varies from 32.8 m to 68.5 m relative to the LAT.
138. Across the Proposed Development array area, the tidal current floods to the south and ebbs to the north. The flows are relatively weak with tidal current speeds typically between 0.5 m/s and 0.6 m/s during peak flood: with ebb currents being of a similar magnitude. At the centre of the Proposed Development array area, the largest proportion of waves approach from the northerly sectors and the largest waves approaching the Proposed Development array area are from the north through to the north-east. Modelled littoral currents (driven by tides and waves) within the Proposed Development array area resulted in an increase of currents on the flood tide and corresponding reduction on the ebb tide.
139. Within the Proposed Development array area, the residual current speeds are low resulting in low sediment transport rates with sediment transports rates typically higher nearer the shore. During storms approaching from the north, sediment transport increases during flood tides in the Proposed Development array area. The non-algal suspended particulate matter (SPM) was estimated to be on average 0 mg/l to 1 mg/l between 1998 to 2015 (Centre for Environment Fisheries and Aquaculture Science (Cefas), 2016) displaying typical seasonal patterns with an increase in concentration in winter months within the Proposed Development.
140. Two potential impacts of physical processes on receptors due to the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These were noted as increased suspended sediment concentrations (SSCs) and associated deposition on physical features as a result of seabed preparation, foundation installation, cable installation, maintenance activity, and decommissioning. As well as the presence of infrastructure potentially leading to changes to tidal currents, wave climate, littoral currents and sediment transport which may result in changes to sediment transport pathways, bank morphology, and beach morphology.
141. An assessment was undertaken for the Proposed Development as described in volume 1, chapter 3 of the Offshore EIA Report which includes details of cable and scour protection. The potential impacts of sediment plumes from increased SSCs and associated deposition on physical features/receptors such as the offshore subtidal sands and gravels, shelf banks and mounds and habitat to aggregations of ocean quahog *Arctica islandica* and moraine formations defining the Firth of Forth Banks Complex ncMPA were either of minor or negligible adverse significance (i.e. not significant in EIA terms). The sediment plumes arising during the construction phase are identified as localised within the development area and do not persist within the Firth of Forth Banks Complex ncMPA and return to background levels within a few tides. Sedimentation during the construction phase comprises of native material which is not expected to influence the bathymetry of receptors such as the sands, gravels and banks within the Firth of Forth Banks Complex ncMPA. Hydrodynamic processes supporting ncMPA characteristics are not altered by the minimal level of bathymetric change as a result of the construction phase sediment releases. Similarly, shelves, banks and mound features would remain stable and supporting hydrodynamics processes for ocean quahog colonisation remain unaffected. The increased sedimentation from the offshore export cables

installation causes little or no sedimentation in the intertidal zone and would be insufficient to affect beach morphology.

142. During the operation and maintenance phase the effects are reduced in comparison to the construction phase, as works are limited to intermittent, discrete repair activities. Overall, for all receptors associated with the Firth of Forth Banks Complex ncMPA, the effect will be negligible to minor adverse significance (not significant in EIA terms). Like the construction phase, the decommissioning phase in response to sedimentation has been identified as localised and composed of native material which is not expected to influence the bathymetry of receptors such as the sands, gravels and banks within the Firth of Forth Banks Complex ncMPA. Overall, for all receptors associated with the Firth of Forth Banks Complex ncMPA, the effect will be negligible adverse (not significant in EIA terms).
143. The presence of infrastructure may lead to changes to tidal currents, wave climate, littoral currents and sediment transport. However, the impacts on receptors such as the offshore subtidal sands and gravels, shelf banks and mounds and habitat to aggregations of ocean quahog and moraine formations defining the Firth of Forth Banks Complex ncMPA was deemed to be of negligible to minor adverse significance (not significant in EIA terms). These minor changes in hydrodynamics occur in close proximity to the location of the wind turbines and do not extend beyond the Proposed Development area. The limited magnitude of changes observed would not alter the hydrography of offshore banks and the habitat for ocean quahog would remain stable. Following the decommissioning phase, the magnitude of the impact would negligible as only those scour and cable protection structures not possible or practical to be removed would remain. Overall, for all receptors, the effect will be negligible to minor adverse significance (not significant in EIA terms).
144. Cumulative impacts of physical processes arising from each identified impact in combination with adjacent offshore wind farm developments were assessed and predicted to result in impacts of negligible to minor adverse significance (not significant in EIA terms) on the Firth of Forth Banks Complex ncMPA. No physical processes mitigation is considered necessary because the predicted impacts in the absence of mitigation is not significant in EIA terms.
145. Monitoring will be undertaken to study the sand wave recovery following seabed clearance activates as these features form the basis for designation. This information will build on the body of knowledge regarding the potential impact of offshore energy infrastructure on physical processes. The project description (volume 1, chapter 3) includes routine inspection and geophysical surveys of wind turbine and OSP/Offshore convertor station platform foundations. Also, offshore export cables, inter-array and interconnector cables burial and protection will be inspected and surveyed as part of the operation and maintenance programme.
146. The inter-related effects due to both project lifetime effects and receptor-led effects were considered for physical processes. Increases in SSC during construction phase would not extend into the operation and maintenance phase. Similarly, those increases which occur in the operation and maintenance phase due to maintenance activities would not extend to decommissioning. Changes to tidal currents and wave climate due to structures relate to the same structures within the construction, operation and maintenance and decommissioning phases. The decommissioning phase structures relate only to those which are not possible or appropriate to be removed thus resulting in a much lesser magnitude of the same impact.
147. In terms of receptor led effects, within the Firth of Forth Banks Complex ncMPA during principally the operation and maintenance phase increased SSCs and associated deposition on physical features may occur due to maintenance activities; this would coincide with changes to tidal currents, wave climate, littoral currents and sediment transport due to the presence of the structures. Maintenance activities are sporadic, with the impacts predicted to be of local spatial extent, short term duration and intermittent. These would therefore not be significant in EIA terms.

148. Effects on physical processes also have the potential to have secondary effects on other receptors and these effects are fully considered in the topic specific chapters. These are presented in volume 2 of the Offshore EIA Report (chapters 8, 9, 10 and 17).
149. No likely significant transboundary effects with regard to physical processes from the Project Development on the interests of other EEA States were predicted.

1.7.1. INTERTIDAL AREA

150. Within the intertidal zone impacts due to changes in physical processes on receptors associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These were increased SSC and associated deposition on physical features as a result of offshore export cables installation and maintenance activity in the nearshore region.
151. Offshore export cables trenching routes do not pass through any of the designated sites, but sediment plumes may reach the outer extent of the Firth of Forth Site of Special Scientific Interest (SSSI) and Barns Ness SSSI comprised of features such as mudflat, sand dune, saltmarsh and sea cliffs. The Skateraw landfall site for the offshore export cables borders the Barn Ness Coast SSSI, however, a trenchless technique has been selected and sedimentation from nearshore cabling occurs off Torness Point. This increase sediment material is native to the sediment cell and will therefore not affect geodiversity. The increased sedimentation from the offshore export cables installation causes little or no sedimentation in the intertidal zone which would be insufficient to affect beach morphology. Overall, for all receptors in the intertidal area, the effect will be negligible (not significant in EIA terms).
152. Cumulative impacts of physical processes arising from each identified impact in combination with adjacent offshore renewable developments were assessed and predicted to result in impacts of negligible adverse significance (not significant in EIA terms) on the Firth of Forth and Barns Ness Coast SSSI.

1.8. BENTHIC SUBTIDAL AND INTERTIDAL ECOLOGY

153. Benthic ecology refers to the communities of animals and plants which live on or in the seabed and the relationships that they have with each other and with the physical environment. The subtidal benthic ecology of the Proposed Development was characterised via a desk top study as well as a series of site-specific surveys using grab sampling, underwater video and epibenthic trawls. An evidence-based approach was used to inform the environmental assessment of effects on the benthic subtidal environment (area below the low tide mark) receptors within the identified benthic subtidal and intertidal ecology study area. The benthic subtidal and intertidal ecology study area encompassed the Proposed Development array area, and the Proposed Development export cable corridor (including intertidal habitat up to MHWS) and associated landfall site.
154. The subtidal surveys indicated that the seabed within the Proposed Development array area supports a variety of communities that are typical of the North Sea. Key habitats recorded in the array area included sediments ranging from sandy gravel to muddy sand, supporting a range of species such as sea urchins, bristle worms, brittle stars and bivalves, as well as offshore mixed sediment habitats characterised by polychaetes and bivalves. The surveys also indicated that the seabed within the Proposed Development export cable corridor supported a range of diverse communities. Key habitats recorded included sandy mud characterised by bivalves and brittle stars, as well as fine mud habitats characterised by sea pens and burrowing megafauna.
155. The sediments within the eastern parts of the Proposed Development array area were dominated by slightly gravelly sands with areas of gravelly sand in the north and south. The sediments within the western parts of the Proposed Development array area were typically slightly coarser and characterised by sandy gravel sediments in addition to slightly gravelly sand and gravelly sand. Within the Proposed Development

- export cable corridor the sediments are characterised as slightly gravelly sand/gravelly sand sediments graded into muddy sand with patches of slightly gravelly muddy sand in the inshore and central sections. The benthic communities in the Proposed Development array area and Proposed Development export cable corridor were characterised by echinoderms (sea urchins and brittle stars), bivalves and polychaetes in both the Proposed Development array area and Proposed Development export cable corridor, both exhibiting similar diverse communities. The muddy sediments in the central section of the Proposed Development export cable corridor were characterised by communities of sea pens and burrowing megafauna.
156. Both the Proposed Development array area and Proposed Development export cable corridor overlap with the Firth of Forth Banks Complex (FFBC) ncMPA which is designated for ocean quahog, offshore subtidal sand and gravels, shelf banks and mounds, and moraines representative of the Wee Bankie Key Geodiversity Area.
 157. A number of likely significant effects on benthic subtidal communities/species, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included increased suspended sediment concentrations and associated deposition, temporary habitat disturbance/loss, long term habitat loss, introduction and colonisation of new habitat, introduction of invasive and non-native species (INNS), disturbance due to electromagnetic fields (EMFs) and habitat disturbance via scour and vessel activities during operation. With the proposed designed in measures in place, the majority of these impacts result in effects of either negligible or minor adverse significance, which is not significant in EIA terms. This was due to the limited extent of the effects on the widespread receptors (species, communities, and habitats) and the localised, short term and reversible nature of the majority of effects.
 158. Temporary habitat loss/disturbance were deemed to be of moderate adverse significance in the construction phase to benthic receptors in the benthic subtidal and intertidal ecology study area. This is significant in EIA terms in the short term, with this decreasing to minor adverse significance in the long term as the sediments and communities are predicted to recover. Therefore, no likely significant long term effects are predicted. This was due to the large area of habitat lost, and benthic ecology receptors present had a low to high sensitivity for this type of disturbance. No other likely significant effects were predicted.
 159. Additionally, impacts to the ocean quahog feature of the FFBC ncMPA, during the construction and decommissioning phases were identified as being of moderate adverse significance for temporary habitat disturbance in the medium term due to their slow recovery rates in comparison with the surrounding habitat (i.e. within ten years of completion of construction activity). This impact however was predicted to reduce to minor adverse significance in the long term as the ocean quahog population and habitat are predicted to recover.
 160. Within the cumulative assessment temporary habitat loss/disturbance impacts were deemed to be of moderate adverse significance in the construction phase to subtidal benthic receptors in the cumulative benthic subtidal and intertidal ecology study area. This is significant in EIA terms in the short term, with this decreasing to minor adverse significance in the long term as the sediments and communities are predicted as likely to recover. Therefore, no long term likely significant effects are predicted. No other significant cumulative impacts were predicted.
 161. Additionally in the cumulative assessment both the subtidal sands and gravels feature of the FFBC MPA were identified to be moderately affected by temporary habitat disturbance in the construction phase. This effect is likely to be short term however with the significance reducing to minor in the long term. The ocean quahog feature was also found to have a significance of effect of moderate for temporary habitat disturbance in the construction phase in the medium term due to their slow recovery rates in comparison with the surrounding habitat (i.e. within ten years of completion of construction activity). This impact however reduced to minor in the long term as the ocean quahog population and supporting habitat are predicted to recover.
 162. No likely significant transboundary effects with regard to benthic subtidal ecology from the Proposed Development on the interests of other EEA States were predicted.
 163. The intertidal benthic ecology of the Proposed Development was characterised via a desk top study as well as a series of site-specific surveys using dig-over sampling. An evidence-based approach was used to inform the EIA on the intertidal environment (area between MHWS and MLWS) ecology receptors within the identified benthic subtidal and intertidal ecology study area. The benthic subtidal and intertidal ecology study area encompassed the Proposed Development array area, and the Proposed Development export cable corridor (including intertidal habitat up to MHWS) and associated landfall site.
 164. These surveys indicated that intertidal environment at Skateraw is characterised by mosaic biotopes which are composed of multiple different habitats. The west of Skateraw is dominated by furoid dominated habitats with some upper shore rock pools. Moving eastwards these transition to habitats dominated by red seaweed and barnacles. On the upper shore in the east and west the habitats transition from rock based to sand based and become dominated by polychaete worms and amphipods.
 165. The Proposed Development export cable corridor and landfall site overlaps with the Barns Ness Coast SSSI, which includes a lower carboniferous geological feature. However, this site will not be directly affected by the Proposed Development as trenchless techniques will be used to install the cable in the intertidal which will avoid this feature.
 166. A number of likely significant effects on benthic intertidal communities/species, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included increased suspended sediment concentrations and associated deposition, introduction of INNS, and alteration of seabed habitats arising from the effects of physical processes. With the proposed designed in measures in place, these impacts result in negligible adverse effects which are not significant in EIA terms. This was due to the limited extent of the effects on the widespread receptors (species, communities, and habitats) and the localised, short term and reversible nature of the effects. Direct impacts to intertidal communities/species, such as those arising from habitat loss/disturbance, will not occur as a result of the Proposed Development because of the commitment to using trenchless techniques to install the cable in the intertidal area.
 167. The cumulative effects assessment concluded that all impacts on intertidal benthic receptors, such as those arising from increases in suspended sediments and associated deposition, and alteration of seabed habitats arising from changes in physical processes, would be of negligible to minor adverse significance, which is not significant in EIA terms.
 168. No likely significant transboundary effects with regard to benthic intertidal ecology from the Project on the interests of other EEA States were predicted.

1.9. FISH AND SHELLFISH ECOLOGY

169. The fish and shellfish ecology assessment focusses on the fish and shellfish communities within the vicinity of the Proposed Development fish and shellfish ecology study area and also the Proposed Development northern North Sea fish and shellfish ecology study area. These include fish and shellfish populations which are important to commercial fisheries in the area (although the effects on those fisheries themselves have been assessed separately (see section 1.12), species which are protected under national and international conservation legislation, and those species which provide an important ecological function to the marine ecosystem (e.g. as prey for birds, marine mammals and larger fish species). The fish and shellfish ecology in the vicinity of the Proposed Development fish and shellfish ecology study area was characterised through a detailed desktop review of existing studies and datasets, alongside site-specific data collected during benthic surveys.

170. Fish and shellfish communities in the Proposed Development northern North Sea fish and shellfish ecology study area are comprised of demersal species, pelagic species, elasmobranch species and diadromous species, which are typical of the northern North Sea. Key marine species include anglerfish, blue whiting, cod, European hake, herring, ling, mackerel, plaice, sandeel, whiting, haddock, sprat, lemon sole, spotted ray, spurdog, tope shark and common skate. Diadromous species expected to be present in the Proposed Development fish and shellfish ecology study area include Atlantic salmon, sea trout, European eel, sea lamprey, twaite shad, and allis shad. A large proportion of the Proposed Development northern North Sea fish and shellfish ecology study area is considered important as nursery and spawning grounds for many of the species listed above.
171. A number of potential impacts on fish and shellfish receptors, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included temporary habitat loss/disturbance, increased suspended sediment concentrations and associated deposition, injury and/or disturbance to fish and shellfish from underwater noise and vibration, long-term habitat loss, EMF from subsea electrical cabling and colonisation of foundations, scour protection and cable protection. All of these impacts were assessed as resulting in effects of either negligible to minor or minor adverse significance, which are not significant in EIA terms.
172. Temporary habitat loss/disturbance was deemed to be of minor adverse significance (not significant in EIA terms) to fish and shellfish Important Ecological Features (IEFs) in the Proposed Development fish and shellfish ecology study area as the proportion of habitat lost is a relatively small amount in context of the available habitats in the Proposed Development fish and shellfish ecology study area.
173. Injury and/or disturbance to fish and shellfish from underwater noise and vibration was deemed to be of minor adverse significance (not significant in EIA terms) to fish and shellfish IEFs in the Proposed Development fish and shellfish ecology study area. Designed in measures including soft start piling procedures (slowly increasing hammer energy from low level to required energy for piling) will allow fish and shellfish IEFs to flee the area reducing risk of injury. Behavioural effects in some fish groups are likely to occur out to approximately 20 km during piling activity before returning to baseline conditions on cessation of piling. The impacts on spawning grounds would be very small in the context of the wider available spawning habitat across the northern North Sea fish and shellfish ecology study area.
174. Cumulative impacts arising from the Proposed Development together with other projects and plans including other offshore renewable energy developments and dredge/disposal activities were assessed and predicted as likely to result in effects of negligible to minor adverse significance (not significant in EIA terms) upon fish and shellfish IEFs within a 25 km buffer of the Proposed Development fish and shellfish ecology study area.
175. No likely significant transboundary effects with regard to fish and shellfish ecology from the Proposed Development on the interests of other EEA States were predicted.

1.10. MARINE MAMMALS

176. The marine mammal assessment focuses on the marine mammal communities within the vicinity of the Proposed Development marine mammal study area and also the regional marine mammal study area. The northern North Sea is an important area for marine mammals, supporting many species of cetaceans and two species of pinnipeds. The distribution of marine mammals is strongly influenced by the distribution of their prey and their occurrence is often unpredictable due to their highly mobile nature.
177. The marine mammal ecology in the vicinity of the Proposed Development marine mammal study area was characterised through a detailed desktop review of existing studies and datasets, alongside site-specific data. Data from the Digital Aerial Survey (DAS) demonstrated that six marine mammal species occurred regularly within the Proposed Development marine mammal study area, and these included: harbour porpoise, bottlenose dolphin, white-beaked dolphin, minke whale, harbour seal and grey seal. Of the

cetaceans, harbour porpoise was the most frequently recorded species and, during site-specific aerial surveys, was sighted in every month of the year. Minke whale and white beaked dolphin were found to be seasonal visitors to the region (summer months), whilst bottlenose dolphins, which primarily move along inshore areas, are part of an east coast of Scotland resident population. Grey seals and harbour seals haul out on shore in coastal areas and make foraging trips out to sea. Seals were recorded regularly during site-specific aerial surveys, with most species identified as grey seal.

178. A number of potential impacts on marine mammal receptors, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. Injury and disturbance from elevated underwater noise could arising from a variety of different activities associated with the Proposed Development including piling, site investigation surveys, clearance of UXOs, vessel use and other construction-related activities. An increased risk of injury of marine mammals could also arise due to collision with vessels. In consideration of the wider ecosystem, the assessment also considered potential indirect effects due to changes in fish and shellfish communities which could affect prey availability for marine mammals.
179. Most of these impacts were assessed as resulting in effects of minor adverse significance, which are not significant in EIA terms. Population modelling was undertaken to support the assessment and demonstrate that, in the long term, there would be negligible effects on the population size of any of the key species. The assessment did, however, conclude a potential for moderate impacts on minke whales (injury) as a result of underwater noise due to piling and harbour porpoise (injury) as a result of clearance of UXOs by full detonation of the munition (injury) was identified, noting that ranges of effect were considered to be highly precautionary due to the conservative nature of the assessment. Given that the potential injury of minke whale could not be mitigated by designed-in measures alone, additional mitigation in form of acoustic deterrent devices (ADD) has been proposed, the implementation of which would reduce the risk and residual significance was assessed as minor adverse, which is not significant in EIA terms. For UXOs, the proposed approach is to clear the munitions using small, shaped donor charges that would neutralise the explosive and therefore not lead to full detonation. Since there is a small, inherent risk of an accidental full detonation could occur, additional mitigation was proposed via use of an ADD and soft-start charges (very small scare charges) and although there remains some residual effect (i.e. potential risk of injury to harbour porpoise), the numbers are likely to be small in the context of the North Sea reference population and therefore the impacts was determined to be of minor adverse significance, which is not significant in EIA terms. Whilst the proposed approach is to avoid the use of full detonation, a European Protected Species licence will be applied for on the basis in the event that such detonation could occur.
180. Cumulative impacts arising from the Proposed Development together with other projects and plans including other offshore renewable energy developments, subsea cables and dredge/disposal activities were assessed and predicted to result in effects of minor adverse significance (not significant in EIA terms) upon marine mammals within a regional marine mammal study area. Population modelling was undertaken for cumulative projects and, as found for the Proposed Development alone, there were no long-term effects on population sizes of key marine mammal species.
181. The assessment finally considered the inter-related effects of multiple stressors on marine mammals. Three main stressors were identified from the impacts: injury or disturbance from underwater noise, injury due to collisions with vessels, and changes in prey communities. Various activities could interact to contribute to each of these stressors (i.e. there are a number of activities that lead to elevations in underwater noise) and in addition each stressor could interact to contribute to a different, or greater effect on marine mammal receptors than when the effects are considered in isolation. The assessment concluded that despite the potential effects from multiple stressors associated with offshore wind farms, marine mammals can quickly recover and return to previously impacted areas.
182. No transboundary effects with regard to marine mammals from the Proposed Development on the interests of other EEA States were predicted.

1.11. OFFSHORE AND INTERTIDAL ORNITHOLOGY

183. The offshore and intertidal ornithology assessment focuses on the seabird communities within the Proposed Development offshore ornithology study area and also the offshore ornithology regional study area. In addition, intertidal bird communities within the intertidal ornithology study area were also considered. The northern North Sea is an important area for seabirds, supporting many species in both the breeding and non-breeding seasons. The distribution of seabirds and intertidal birds is strongly influenced by the distribution of their prey and their occurrence is often unpredictable due to their highly mobile nature.
184. The seabird ecology in the vicinity of the Proposed Development offshore ornithology study area was characterised through a detailed desktop review of existing studies and datasets, alongside site-specific digital aerial survey (DAS) data. Similarly, bird ecology in the intertidal ornithology study area was characterised by a detailed desktop review of existing studies and datasets, alongside site-specific survey data.
185. Data from the DAS demonstrated that 28 seabird species were recorded within the Proposed Development offshore ornithology study area with the most frequently recorded species being: gannet, kittiwake, herring gull, lesser black-backed gull, guillemot, razorbill and puffin. Seabird numbers were typically highest during the breeding season, with lower numbers recorded in the non-breeding season. Data from the Intertidal surveys demonstrated that 54 species were recorded within the intertidal and nearshore Survey Area, with the most frequently recorded species being: eider, oystercatcher, turnstone, curlew, dunlin and redshank. Highest numbers of birds on the intertidal surveys were typically recorded in the non-breeding season.
186. A number of potential impacts on offshore and intertidal ornithology receptors, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. Disturbance and displacement effects could arise from a variety of different activities associated with the Proposed Development including vessel activity, cable-laying and other construction-related activities, as well as from the wind turbines. Collision and displacement effects could occur during the operation phase. In consideration of the wider ecosystem, the assessment also considered potential indirect effects due to changes in fish and shellfish communities which could affect prey availability for seabirds. In terms of intertidal ornithology, disturbance effects from vessel activity and cable-laying activities were considered.
187. Disturbance and displacement effects within the Proposed Development array area as a result of construction and decommissioning activities were assessed as resulting in effects of negligible to minor adverse significance, which is not significant in EIA terms, as were effects from aviation and navigation lighting. Indirect effects as a result of habitat loss or displacement of prey species due to increased noise and disturbance to the seabed were also assessed as resulting in effects of negligible to minor adverse significance, which is not significant in EIA terms. Disturbance and loss of seabed habitat effects resulting from cable installation/removal within the Outer Firth of Forth and St Andrews Bay Complex SPA, including the intertidal study area were also assessed as being of not more than minor adverse significance, which is not significant in EIA terms.
188. For displacement, barrier and collision effects in the operation phase, population modelling was undertaken to support the assessment and to investigate any long-term effects from the Proposed Development on the population size of any of the key species. For the ornithological assessment two approaches were undertaken – the Developer Approach and the Scoping Approach, which includes a low (Scoping Approach A) and high (Scoping Approach B) range of results, with the justification for these differences presented in volume 3, appendix 11.4.
189. For the project alone, for the five key species considered, displacement and barrier effects in the operation phase were assessed to be of no more than minor adverse significance for gannet, kittiwake, razorbill and puffin. These effects are therefore not significant in EIA terms. For guillemot, displacement and barrier

effects in the operation phase were considered to be minor adverse, however for Scoping Approach B, the effect was considered to be moderate adverse, which is significant in EIA terms. However, it is considered that the displacement mortality rates used in Scoping Approach B are likely to be highly precautionary, for the reasons outlined in volume 3, appendix 11.4.

190. For the project alone, for the eight key species considered, collision effects from wind turbines during the operation phase were assessed to be of no more than minor adverse significance for gannet, herring gull, lesser black-backed gull, little gull, common tern, Arctic tern and great skua. These effects are therefore not significant in EIA terms. For kittiwake, collision effects from wind turbines during the operation phase were considered to be minor to moderate adverse. However, these effects were revised under expert judgement to be minor adverse, which is not significant in EIA terms. This is because combining displacement and collision effects is considered extremely precautionary, as outlined in volume 3, appendix 11.3 and appendix 11.4.
191. Cumulative impacts arising from the Proposed Development together with other projects and plans including other offshore renewable energy developments, subsea cables and dredge/disposal activities were also assessed. The cumulative effects assessed included displacement and barrier effects from offshore infrastructure and collision effects from wind turbines during the operation phase. Overall, it was concluded that there will be a likely significant effect on guillemot and razorbill for Scoping Approach B arising from cumulative displacement effects from the Proposed Development alongside other projects/plans. In addition, there will also be a likely significant effect on gannet and kittiwake for Scoping Approach B from combined displacement and collision effects from the Proposed Development alongside other projects/plans.
192. The assessment finally considered the inter-related effects of multiple stressors on offshore and intertidal ornithology. One main stressor was identified from the impacts: overall effects on foraging seabirds from potential changes in prey communities that could be caused by disturbance, habitat loss or SSC.
193. Various activities could interact to contribute to this stressor (i.e. there are a number of activities that could lead to changes in seabird prey communities). The assessment concluded that due to the high mobility of foraging seabirds and their ability to exploit different prey species, and the small scale of potential changes in context of wider available habitat, any changes to fish prey communities are unlikely to have a significant effect on foraging seabirds.
194. No transboundary effects with regard to offshore and intertidal ornithology from the Proposed Development on the interests of other EEA States were predicted

1.12. COMMERCIAL FISHERIES

195. Commercial fishing is defined as any form of fishing activity legally undertaken for taxable profit. The activity of Scottish and non-Scottish commercial fishing fleets operating in the vicinity of the Proposed Development was characterised through desktop review and analysis of available fisheries data, and through direct consultation with local fishermen via the Fisheries Liaison Officer (FLO).
196. The commercial fisheries study area supports the following main commercial fishing activities:
- demersal otter trawling (predominantly for *Nephrops* and to a much lesser extent squid);
 - creeling for lobster and crab; and
 - scallop dredging.
197. Demersal trawling for *Nephrops* concentrates in inshore areas of the commercial fisheries study area, predominantly within the 6 nm limit, including in areas that overlap with the Proposed Development export cable corridor. Within the Proposed Development array area, negligible levels of trawling for *Nephrops* are expected. Demersal trawling for squid is often undertaken by *Nephrops* trawlers that change gear to target the squid fishery seasonally. Vessels targeting squid in the commercial fisheries study area are primarily

active in inshore areas, including in sections of the Proposed Development export cable corridor. There is also potential, however, for some activity to take place within the Proposed Development array area. This is expected to be primarily undertaken by visiting squid vessels from other areas of the east coast of Scotland.

198. Creeling, targeting lobster and crab, is undertaken at greater levels in inshore areas of the commercial fisheries study area. Although at a relatively lower level, considerable activity by local creelers has also been reported from offshore areas, including within the Proposed Development array area, particularly around its north-western section.
199. Scallop dredging by vessels over 15 m in length (typically nomadic vessels) is undertaken at moderate levels in areas of relevance to the Proposed Development array area, being predominantly concentrated in its north-western section. The level of activity recorded within the Proposed Development is however relatively low compared to that recorded in other grounds around Scotland and the UK that are targeted by the nomadic scallop fleet. There is also some activity by smaller scallop dredgers (under 15 m local vessels) within the commercial fisheries study area. This is however limited to inshore areas and shows limited overlap with the Proposed Development export cable corridor.
200. A number of potential impacts on commercial fisheries, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These include loss or restricted access to fishing grounds, displacement of fishing activity into other areas, increased steaming times, snagging risk (loss or damage to fishing gear) and safety issues, interference with fishing activities and potential impacts on commercially exploited species. All of these impacts were assessed as resulting in effects of either negligible to minor or minor/tolerable adverse significance, which are not significant in EIA terms.
201. Loss or restricted access to fishing grounds was deemed to be of minor adverse significance (not significant in EIA terms) to relevant commercial fisheries receptors operating in the commercial fisheries study area, due to the implementation of a range of measures. This includes close fisheries liaison with the industry stakeholders, management methods (i.e. use of guard vessels and Offshore Fisheries Liaison Officers (OFLOs) to maintain good communication between vessels active on the Proposed Development) and use of mitigation through cooperation payments where necessary and appropriate.
202. Increased steaming times were deemed to be of minor adverse significance (not significant in EIA terms) to relevant commercial fisheries receptors operating in the commercial fisheries study area. This is due to the very small spatial extent of the safety zones and/or advisory measures as well as the majority of fishing vessels being able to adapt to changes in steaming routes. Smaller vessels that operate in nearshore waters will have less ability to adapt steaming times. As above, there will also be appropriate fisheries liaison and management measures to minimise effects on commercial fisheries receptors.
203. Snagging risk (loss or damage to fishing gear) and safety issues was deemed to be of minor adverse significance (not significant in EIA terms) to relevant commercial fisheries receptors operating in the commercial fisheries study area. A number of liaison and management measures will be implemented to ensure that loss or damage to fishing gear and associated safety issues is minimised and mitigated appropriately. This will include the circulation of the required information with regard to construction works, including on the location of safety zones and advisory measures. In addition, guard vessels and OFLOs will be used during construction as appropriate.
204. Cumulative impacts arising from the Proposed Development together with other projects and plans including other offshore renewable energy developments and subsea cables were assessed and predicted as likely to result in effects of negligible to minor/tolerable adverse significance (not significant in EIA terms) upon commercial fisheries receptors within the commercial fisheries CEA study area.
205. No likely significant transboundary effects with regard to commercial fisheries from the Proposed Development on the interests of other EEA States were predicted.

1.13. SHIPPING AND NAVIGATION

206. Shipping and navigation refers to the flow of vessel traffic including commercial and non-commercial vessels, as well as emergency response facilities used to manage incidents at sea. Shipping and navigation within and in proximity to the Proposed Development was characterised via site-specific surveys, desktop studies and consultation.
207. The vessel traffic survey data, covering 28 days in winter 2021 and summer 2022 and colour-coded by vessel type, is presented in Figure 1.3 and Figure 1.4. During the summer vessel traffic survey an average of 14 unique vessels per day were recorded within 10 nm of the Proposed Development array area, with the main vessel types being tankers (30%), cargo vessels (23%) and passenger vessels (12%). During the winter vessel traffic survey an average of 14 unique vessels per day were recorded within 10 nm of the Proposed Development array area, with the main vessel types being cargo vessels (37%), tankers (32%) and commercial fishing vessels (13%). Although, passenger vessels were not present in the winter vessel traffic surveys, an analysis of long-term vessel traffic data indicated an average of one unique passenger vessel every two days within 10 nm of the Proposed Development array area, with this discrepancy attributed to the COVID-19 pandemic and confirmed during consultation.
208. From desktop studies, key navigational features were identified including other offshore wind farms, ports and related services and aids to navigation. In particular, there are three other large-scale offshore wind farm developments within the Outer Firth of Forth: Seagreen, Inch Cape and NNG (see Figure 1.1 for locations).
209. A number of potential impacts on shipping and navigation associated with the construction, operation and maintenance and decommissioning phases of the Proposed Development were identified. These included:
 - vessel displacement;
 - increased vessel to vessel collision risk between a third-party vessel and a project vessel;
 - increased vessel to vessel collision risk between third-party vessels;
 - vessel to structure collision risk;
 - reduced access to local ports;
 - reduction of under keel clearance;
 - interaction with subsea cables;
 - reduction of emergency response capability; and
 - interference with magnetic position fixing equipment.
210. With the relevant designed in measures in place, the significance of effect was deemed to be broadly acceptable or tolerable for all impacts and phases assessed.
211. The displacement of vessels from their existing routes due to the presence of the Proposed Development and/or activities was deemed to be of tolerable significance (not significant in EIA terms) for all vessels, given the likely increases in journey times and distances leading to increased fuel consumption. However, it is likely that time losses can be made up through effective passage planning and increased speeds when in open seas, limiting disruption to schedules.
212. The increased risk of vessel collision was deemed to be broadly acceptable (not significant in EIA terms) for all vessels due to the risk of collision being extremely unlikely. Vessels are expected to be compliant with regulations including COLREGSs, and promulgation of information and charting of infrastructure associated with the Proposed Development which will maximise awareness of the Proposed Development and ongoing activities.
213. The reduction in under keel clearance considered for the operation and maintenance phase was deemed to be broadly acceptable (not significant in EIA terms). The frequency of occurrence is considered to be extremely unlikely and in compliance with the requirements of MGN 654 any change to water depth of more than 5% chart datum will require consultation with the MCA and NLB.

214. The risk of interaction with subsea cables was considered for the operation and maintenance phase and was deemed to be broadly acceptable (not significant in EIA terms). It is considered that there is a low likelihood of vessel anchoring in the area and alongside the burial and protection of cables which will be determined by a cable burial risk assessment, it is considered highly unlikely that an anchor interaction incident would occur.
215. The vessel to structure allision risk due to the presence of the Proposed Development was deemed to be of tolerable significance (not significant in EIA terms) for all vessels, given the exposure to new surface infrastructure not previously in the area for vessels under power, adrift or navigating internally within the array (small craft only). However, the likelihood of an allision incident is considered low given that project vessels will be able to ensure third-party users are aware of the Proposed Development and act under International Convention for the Safety of Life at Sea (SOLAS) obligations should an incident develop.
216. The reduction in access to local ports due to the presence of the Proposed Development and/or activities was deemed to be of tolerable significance (not significant in EIA terms) for all vessels, given the likely disruption to vessel approaches to and from the Firth of Forth or other local ports. However, disruption to port related services such as pilot boarding and the operation of the Vessel Traffic Service (VTS) system for the Firth of Forth are not anticipated to be affected.
217. The reduction in emergency response capability (including Search and Rescue (SAR) access) due to the presence of the Proposed Development was deemed to be of tolerable significance (not significant in EIA terms) for emergency responders and all vessels, since the likelihood of an incident requiring emergency response will be greater due to the increased presence of project vessels and new infrastructure. However, project vessels will be managed by marine coordination and the Applicant intends to comply with MCA guidance relating to array layouts and emergency response.
218. The same impacts assessed for the Proposed Development in isolation were also assessed as part of the CEA, which included other offshore wind farm developments in the area. With the relevant designed in measures in place, the significance of effect was deemed to be either tolerable or broadly acceptable (not significant in EIA terms).
219. Vessel displacement for commercial routeing between international ports was identified as a transboundary effect. Given the international nature of commercial vessel traffic, the relevant receptors are captured as part of the vessel traffic survey data and are subsequently suitably considered within the CEA, concluding that the effect is of tolerable significance, which is not significant in EIA terms.

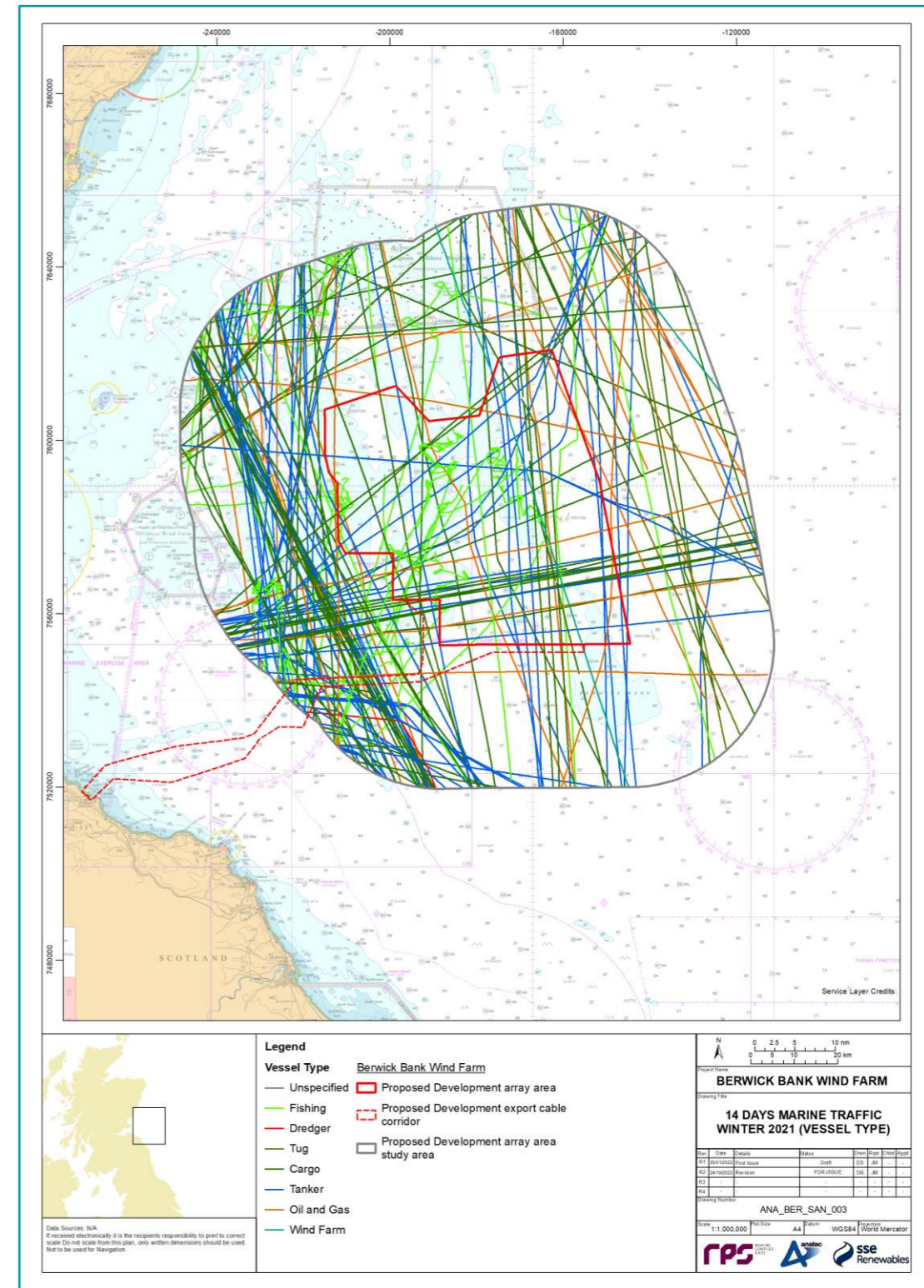


Figure 1.3: Vessel Traffic Survey Data within Proposed Development Array Area Shipping and Navigation Study Area (14 Days, Winter 2021)

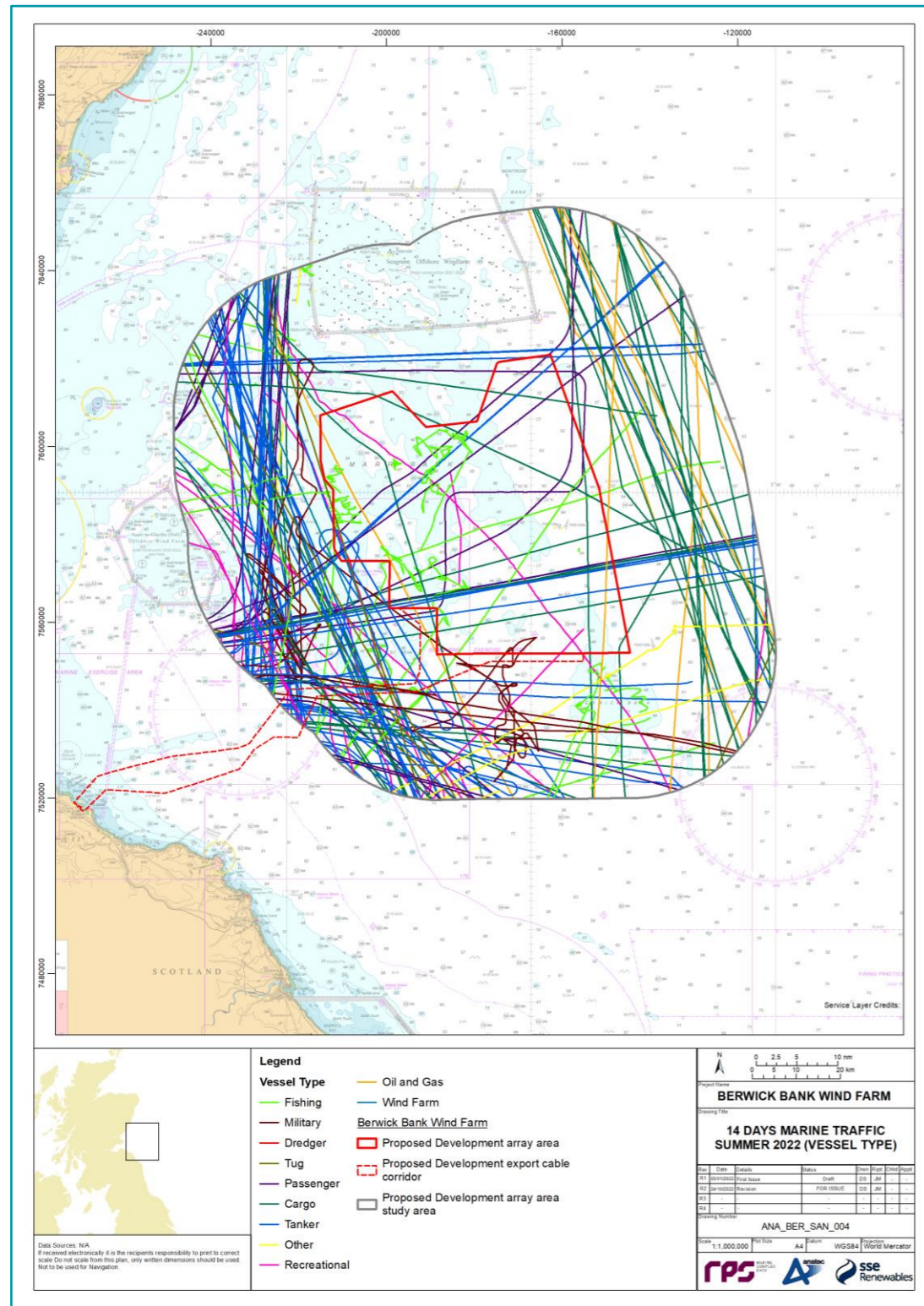


Figure 1.4: Vessel Traffic Survey Data within Proposed Development Array Area Shipping and Navigation Study Area (14 Days, Summer 2022)

1.14. AVIATION, MILITARY AND COMMUNICATIONS

220. The Aviation, Military and Communications Chapter assesses the likely significant effects (as used by the EIA Regulations) of the Proposed Development on aviation, military and communications receptors.
221. With reference to the Infrastructure and Other Users Chapter (which confirms an absence of subsea telecommunications cables or other communications receptors in the vicinity) and feedback from consultees such as British Telecom (BT), the Applicant was able to determine that the Proposed Development would have no likely significant effects on communications (infrastructure or services). Therefore, no detailed consideration was given to effects on forms of telecommunication such as interference with cellular telephone service coverage, television scanning telemetry or non-aviation radar, satellite communications (e.g. with offshore oil and gas), maritime communications, Very High Frequency radio and/or microwave links or any other forms of cabling (telecommunications and interlinks).
222. The key aviation and military receptors identified for assessment concern civilian and military radar systems and the potential for the Proposed Development to impact on Air Traffic Control (ATC) and Air Defence (AD) capabilities. During construction, the installation of wind turbines (or objects more than 91.4 m in height) such as vessels with cranes present risks (obstacles) to low flying aircraft (including SAR helicopter operations). These risks will be managed through the agreement of a Lighting and Marking Plan (LMP) (volume 4, appendix 27) with aviation stakeholders that will coordinate lighting and marking details for construction infrastructure. Consequently, likely significant effects are anticipated to be of minor adverse significance for the Proposed Development, considered alone and cumulatively.
223. During operation, radar interference (or "clutter") generated by the spinning blades of the wind turbines during operation could desensitize radar in the area of the wind farm. This radar interference can hinder the detection of legitimate targets and therefore, operational aircraft safety. These effects were considered cumulatively in the context of four other offshore wind farm developments operating or u in the Firth of Forth and Tay.
224. The following relevant radar systems were identified through a desktop review and consultation with the relevant stakeholders:
 - MoD Brizlee Wood AD radar;
 - MoD Buchan AD radar;
 - MoD Leuchars Station ATC radar;
 - MoD Spadeadam Deadwater Fell ATC radar;
 - NERL Allanshill ATC radar; and
 - NERL Perwinnes ATC radar.
225. Effects on both ATC and AD radar were assessed as high magnitude. As the receptors are high sensitivity, the chapter predicts major adverse effects for six potential ATC and AD radar systems during the Proposed Development's operational lifetime (which is significant in EIA terms). These effects will be reduced to negligible (and non-significant in EIA terms), by mitigation solution implemented by New Enroute Centre (NERC) (for ATC radar) and the Ministry of Defence (MoD). NERL has proven processes and techniques to mitigate the adverse impact of wind turbines on their ATC radar. It is likely that the proposed solution will be the use of multi-Radar Tracker blanking, which is a technical mitigation solution routinely offered by NERL that removes wind turbines returns from the ATC radar display.
226. The MoD has a recognised process for entering into agreement for AD radar migration. The MoD has recently started accepting mitigation proposals for alternative technologies other than 3-D Non-Auto Initiation Zone (NAIZ) which has allowed them to withdraw AD radar objections subject to agreement of a suitably worded suspensive planning condition); thereby, de-risking the consenting process. Negotiations with NERL and MoD are continuing.

227. The potential for impacts from the wind turbines on civil airport patterns and procedures was investigated by a Civil Aviation Authority (CAA) approved agent. This investigation, reported in volume 3, appendix 14.2 concluded there would be no impact from the Proposed Development on the published Instrument Flight Procedures (IFPs) at Aberdeen Edinburgh, and Dundee Airport. Accordingly, this impact was scoped out of the Aviation, Military and Communications Chapter as agreed by CAA.
228. The likely significant effects of the Proposed Development are considered to be significant (without mitigation) irrespective of the cumulative situation. However, with application of secondary mitigation in the form of radar mitigation solutions, all cumulative effects are assessed as minor and are not significant in EIAR terms.
229. There were no likely significant transboundary effects with regard to aviation, military and communications from the Proposed Development upon the interests of other EEA States.

1.15. SEASCAPE, LANDSCAPE, AND VISUAL RESOURCES

230. The Seascape, Landscape and Visual Impact Assessment considers the significance of changes resulting from the Proposed Development on coastal (seascape) character and on people's views and visual amenity, as well considering the cumulative effects with other projects.
231. The Proposed Development array area has been sited 37.8 km offshore from closest part of the array area to the closest section of coast. The eastern edge of the array area is generally located at distances over 60 km from the coast. The siting of the Proposed Development at long distance offshore forms the key designed in measure which minimises potential for significant seascape, landscape and visual effects experienced in coastal views.
232. The spatial extent of the northern part of the Proposed Development array area was also reduced during the project design which increased its distance offshore from the coast of Aberdeenshire, Angus and Fife, reducing effects on receptors in these areas.
233. The SLVIA is based on the likely significant effects of a realistic 'worst-case' scenario layout with 179 wind turbines at the highest potential blade tip height (355m), with wind turbines occupying locations that represent the impacts arising from the full extent of the wind farm array area.
234. In accordance with guidance (GLVIA3 - Landscape Institute, 2013), existing offshore and onshore wind farms and those which are under construction are included in the baseline for both landscape and visual effects assessments. As both Neart na Gaoithe and Seagreen 1 are they currently under-construction and expected to be operational before the Proposed Development starts construction offshore, they are assumed to be part of the baseline i.e., they are assumed to be operational for the purposes of the SLVIA.
235. The SLVIA considers effects within a large study area of 60 km radius, assessing the effects of the Proposed Development arising on the coastal character and views from the coastline of Aberdeenshire, Angus, Fife, East Lothian, Scottish Borders and Northumberland.
236. The Angus coastline is located to the north-west of the Proposed Development and is over 40.3km from the Proposed Development. Despite the potential visibility of the Proposed Development from the coastline, the coastal character and views will generally experience not significant (moderate/minor) effects due to the long distance of the Proposed Development from the coast; the relatively small apparent scale of the wind turbines and their location partially behind Seagreen 1 offshore wind farm, which means it adds a relatively narrow additional spread of wind turbines as an extension of the wind turbine elements that are already present in the views.
237. The coastline of Fife is located to the west of the Proposed Development, with coastline between St Andrews and St Monans, with the closest point at Fife Ness situated 40.9 km from the Proposed Development. Despite the high and medium-high sensitivity of the coastal character and views from parts of the Fife coastline, the effect of the Proposed Development on the perceived character and visual amenity is assessed as not significant due to the low magnitude of change arising from the Proposed Development on the character and views of the coastlines of the St Andrew's to Fife Ness coast, and East Neuk of Fife. The Proposed Development will largely be subsumed behind Neart na Gaoithe offshore wind farm in views from the Fife coastline, contributing mainly to an increase in the density of wind turbines where they overlap and a very narrow increase in lateral spread, in which the majority of open sea skyline will be retained and remain unaffected.
238. The East Lothian coastline is located to the south-west of the Proposed Development and is situated over approximately 45 km from the Proposed Development at its closest point (Torness Point). The sensitivity of the coast is very variable as it includes many local SLA designations covering the coastline yet this is moderated by the extent of modification by settlement, industrial/energy generation development and busy transport routes, as well as the presence of Neart na Gaoithe offshore wind farm in the seascape setting approximately 28 km from the closest parts of the coast. Not significant effects on the perceived coastal character, special qualities and views/visual amenity are assessed as occurring as a result of the Proposed Development, due to the generally medium-low magnitude of change. The Proposed Development will be at long distance offshore (45 km to 56 km) separating coastal viewpoints, which means that it will appear relatively small in vertical scale, generally low on the horizon and viewed in the context of a southern extension to the existing Neart na Gaoithe offshore wind farm, while retaining the wider open sea horizon and separation from the coast.
239. The Scottish Borders coastline includes section of more remote, exposed and dramatic coastline within the SLVIA Study Area within the Berwickshire Coast SLA and the section at St Abb's Head forms the closest section of coast, situated approximately 37.8 km to the east of the Proposed Development. The scenic quality of much of the Scottish Borders coastline is recognised by the Berwickshire Coast SLA designation at a local level and historic environment assets, which contribute to the societal recognition of its value. The coastline within the St Abb's area is strongly associated with the sea, particularly where cliffs provide elevation, and has a higher sensitivity to development at sea. Significant effects will arise from the Proposed Development on the perceived character of the coastline and views/visual amenity between Fast Castle Head and Eyemouth, including from the Berwickshire Coastal Path and views from Fast Castle (Viewpoint 13), Tun Law (Viewpoint 14), St Abb's Head (Viewpoint 15) and Eyemouth (Viewpoint 16). The visual effects will be relatively higher in these areas due to the elevation of the coast, which has views 'over' the seascape and the Proposed Development due to its aspect, with a greater amount of the wind turbines being visible and a wider proportion of the field of view occupied at relatively closer range. The addition of the Proposed Development to the seascape context will influence the open and exposed character and the wide views out to sea, however due to its position offshore, it avoids the dramatic coastal scenery, the rocky coastline and stretch of cliffs in views along the coast. The wild, expansive and exciting qualities of the coast will fundamentally continue to be experienced and define to the character and quality of the coast.
240. The Northumberland coastline is located over 40 km to the south of the Proposed Development. Views to the open sea are extensive and include striking vistas to coastal landmarks, such as Lindisfarne and Holy Island; and dramatic distant views from the beaches along the northern rugged coastline. Not significant effects on views experienced by people along the Northumberland coastline have been identified at views from Berwick-upon-Tweed, Cocklawburn Beach, Lindisfarne Castle and Bamburgh Castle. The long distance (46.0 to 60.1 km) separating the viewpoints from the Proposed Development means that it will appear within a peripheral location with regards to the expansive, open seascape and will generally appear low on the horizon and relatively small in scale. Characteristic views along the coastline and out to sea will remain, and it will remain an exposed, relatively undeveloped landscape whose character is governed by the influences of the sea and weather. Not significant effects on the Northumberland Coast AONB (and North Northumberland Heritage Coast) occur due to their distance from the wind farm array area (47.9 km and 41.8 km respectively). Low levels of change and not significant effects occur on the Northumberland Coast AONB's special qualities. Due to the limited and localised significant effects on views across the

coast and seascape, and the context in which these occur, neither the natural beauty nor the purposes of designation of the Northumberland Coast AONB will be compromised, nor will its integrity be harmed or undermined.

241. The effect of the visible lighting of the Proposed Development at night will be dependent on a range of factors, including the intensity of lights used, the clarity of atmospheric visibility and the angle of view from the light to the observer. There are no specific dark sky parks with viewing locations promoted for viewing the night skies and the baseline lighting conditions across the SLVIA study area vary considerably, with coastal urbanised areas and settlement forming the brightest light sources and the darker landscapes often being located inland associated with areas of upland and restricted to sections of less developed coast such as the Berwickshire Coast in the Scottish Borders. The effect of the Proposed Development lighting at night is assessed to be of low magnitude and not significant in views from Angus and Fife, where the additional lighting will appear behind and overlapping much of Seagreen 1 or Neart na Gaoithe, increasing to medium-low in views from East Lothian where the spread of lighting is greater, however this is moderated by the increased distance of the lights offshore (at over 45 km from the closest parts of the East Lothian coast). The effect of the Proposed Development lighting at night is only assessed as being significant in views from the coastline around St Abb's Head, due to the combination of its higher sensitivity and the change resulting from the lighting to the dark seascape in the view off this coast at night. Aviation lights will however be low to the horizon and do not extend into, nor impede, the wider expanse of night sky, nor result in brightening of the night sky (skyglow) or glare on to the sea surface and would therefore not be of detriment to the experience of the night skies. The distance of the coastlines of the study area from the potential sources of light reduces the effects as viewers are unlikely to perceive the aviation lights to any degree of intensity at such long range.
242. The effects of the Proposed Development will vary according to the weather and prevailing visibility. The varied clarity or otherwise of the atmosphere will reduce the number of days (the 'frequency') upon which views of the Proposed Development will actually be available from the coastline, and is likely to inhibit clear views, rendering the Proposed Development wind turbines located at long distance offshore, as visually recessive within the wider seascape. Effects that may be assessed as being significant under 'very good' or 'excellent' (i.e. worst-case/optimum) visibility conditions, may be not significant under moderate, poor or very poor visibility conditions. The assessed worst case optimum visibility out towards the wind turbines and the horizon does not occur very often and for the greater part of the time the clarity of long-distance views out to sea will not be part of the experience of those enjoying the coast and under the more frequent sub optimal conditions, the effect of the wind turbines on views will not be significant.
243. The cumulative effect assessment undertaken takes account the impact associated with the Proposed Development together with other relevant plans, projects and activities. In accordance with guidance (NatureScot, 2021 and Landscape Institute 2013), existing projects and those which are under construction are considered as part of the baseline conditions. A tiered approach to the CEA is adopted based on the differing potential of projects for proceeding and ultimately contributing to a cumulative impact.
244. The Tier 1 assessment considers the Proposed Development (Berwick Bank Wind Farm offshore) with Berwick Bank Wind Farm onshore i.e. a whole project assessment. It found that the majority of receptors will not experience tier 1 cumulative effects since they have either no visibility, or very limited/distant visibility, of either the onshore infrastructure or the Berwick Bank Wind Farm offshore. The main tier 1 cumulative effect during construction is likely to occur in views experienced by walkers along a short section of the John Muir Way between Torness and Chapel Point, and visitors to Skateraw Harbour, where the construction of the landfall will be visible at close range in combination with the construction of the Berwick Bank Wind Farm offshore and the construction of the onshore substation in inland views, which are assessed to be significant (major/moderate), although temporary during construction.
245. The Tier 2 assessment considers projects consented and submitted but not yet determined. These consist of offshore and onshore wind farms within the SLVIA study area but the primary impact interactions result from the Proposed Development with the consented Inch Cape offshore wind farm and Seagreen 1A, The

contribution of the Proposed Development to the cumulative effect with tier 2 projects on views and perceived character of the South-East Aberdeenshire, Fife and Angus coastline of the SLVIA study area has been found to be medium-low to low with effects not significant (moderate to minor), due to it being visually recessive at long distance offshore partially behind Inch Cape and Seagreen 1A, with Inch Cape contributing most to the overall cumulative effect on the views given its closer proximity and larger vertical scale. The cumulative effect of the Proposed Development with tier 2 projects is also assessed as medium-low and not significant. The cumulative effect of the Proposed Development with tier 2 projects is also assessed as medium-low and not significant in views and perceived character of the East Lothian coast and progressively reduces to low in views from the Scottish Borders coastline, fundamentally because tier 2 projects (Inch Cape and Seagreen 1A in particular) will have a limited influence on views, as they are located at very long range (over approximately 56km and 69km respectively from the coast)

1.16. INFRASTRUCTURE AND OTHER USERS

246. The infrastructure and other users chapter considers the impact of the Proposed Development on the following:
- recreational sailing and motor cruising;
 - kite surfing, surfing and windsurfing;
 - sea/surf kayaking and canoeing;
 - scuba diving;
 - recreational fishing;
 - other offshore wind farm projects;
 - offshore telecommunications cables and subsea cables;
 - carbon capture and storage and natural gas storage;
 - disposal sites;
 - aggregate extraction; and
 - oil and gas operations (including pipelines) and additional renewable energy projects.
247. Information on infrastructure and other users was collected through a detailed desktop review of existing studies and datasets through consultation. Due to the distance from the Scottish coast, the level of recreational activity within the Proposed Development array area is low, and recreational fishing is likely to be limited. There is low to medium recreational vessel activity in the nearshore area of the Proposed Development export cable corridor, numerous offshore routes, and general boating areas located to the north and south of the Proposed Development export cable corridor. Boat angling and shore angling take place along the Scottish coastline and surfing, kite surfing and wind surfing predominantly occur north of the Proposed Development export cable corridor. There are 11 scuba diving sites within the broad infrastructure and other users study area – potential increased turbidity area.
248. The closest offshore wind farm projects to the Proposed Development array area are the NnG offshore wind farm (under construction), Inch Cape offshore wind farm (consented), the Seagreen 1 offshore wind farm (under construction) and the Seagreen 1A Project wind farm with its Export Cable Corridor (consented). There are two planned subsea cables within the infrastructure and other users study area – inner area, and more specifically within the Proposed Development array area and export cable corridor (Eastern Link 1 offshore export cables). In the landfall location, the Proposed Development export cable corridor also crosses the export cable corridor for the NnG offshore wind farm. There are no wave and tidal projects, aggregate extraction sites, active disposal sites, active license blocks, or carbon capture and natural gas.
249. A number of potential impacts on infrastructure and other users, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included displacement of recreational craft, recreational vessels and recreational activities, and restriction of access to cables and pipelines associated with the NnG offshore wind farm and Eastern Link 1 offshore

export cables. With the proposed mitigation measures in place, there will be negligible significant effects arising from the Proposed Development array area and Proposed Development export cable corridor in isolation during the construction, operation and maintenance, or decommissioning phases on recreational vessels, recreational fishing, recreational users, and restrictions to temporary access of the NnG and Eastern Link 1 offshore export cables. These impacts result in effects of minor adverse significance (not significant in EIA terms).

- 250. Cumulative impacts associated with the construction, operation and maintenance and decommissioning of the Proposed Development array area and Proposed Development export cable corridor together with other offshore wind farm developments, and cables and pipelines, were assessed and predicted to result in effects of minor adverse significance upon recreational users and recreational activities; and cables and pipeline receptors and are not significant in EIA terms
- 251. No transboundary effects with regard to infrastructure and other users from the Proposed Development array area and Proposed Development export cable corridor on the interests of other EEA States were predicted.

1.17. OFFSHORE SOCIO-ECONOMICS AND TOURISM

- 252. The offshore socio-economics assessment of effects considers the local economies, populations, tourism and recreation activities which are located in the areas that might be affected by the Proposed Development. This includes the areas closest to offshore activities as well as other important locations that may be used to support the construction, operation and maintenance, and decommissioning activities related to the offshore elements of the Proposed Development (e.g. laying cables offshore, installing the wind turbines etc). These are primarily port and harbour facilities on the east coast of Scotland. The assessment also considers how the Proposed Development might affect Scotland as a whole.
- 253. The exact location of port and harbour facilities that might be used to support the various phases of the Proposed Development are not yet determined. As such, the assessment has looked at the potential locations currently on the short list for selection which are summarised in Table 1.2 below. Assumptions have been made about contracting and procurement decisions which have not yet been taken. These underpinning assumptions draw on previous offshore wind farm projects, along with an understanding of the potential range of activities that could be located in Scotland and within the local areas under consideration.

Table 1.2: List of Potential Construction, Operation and Maintenance, and Decommissioning Facilities

Construction/Decommissioning Phases	Operation and Maintenance Phase	Operation and Maintenance Support Harbours
Port of Nigg	Aberdeen Harbour	Cockenzie Harbour
Aberdeen Harbour	Montrose Port	Dunbar Harbour
Port of Dundee	Port of Dundee	Eyemouth Harbour
Port of Leith	Methil	
	Burntisland	
	Port of Rosyth	
	Port of Leith	

- 254. The offshore wind sector is identified as a high priority industry within national, regional and local policies across Scotland. This reflects the opportunities the sector provides for supporting economic development and growth and providing jobs and incomes for Scottish residents. Prior to the COVID-19 pandemic there were 2.6 million people employed in Scotland (Office for National Statistics (ONS) Business Register and

Employment Survey, 2019) and total economic output (measured by gross value added (GVA)) was measured as £147 billion (ONS, 2021). It is very hard to define the size of the offshore wind sector using official statistics, however, detailed research by the Fraser of Allander Institute (FAI) estimated that there were 4,700 full time equivalent (FTE) jobs and £447 million in GVA supported by the offshore wind sector in Scotland in 2019. This is therefore currently a small sector when compared to the whole economy, but one with the potential to grow – research by Skills Development Scotland indicates it could support 20,000 jobs by 2031.

- 255. Aberdeen socio-economics local study area has the largest employment base in activities relevant to the offshore wind sector, largely because of its long standing strength in the oil and gas industry. However, employment has been falling in recent years. The offshore wind sector is identified as a potential employment option for workers transitioning from oil and gas related activities. Other socio-economics local study areas under consideration have a smaller employment base in relevant sectors at present. Economic activity rates, which measure the share of the population that are ready and able to work, are higher than the Scottish average across all the socio-economics local study areas. Unemployment is also falling across these locations.
- 256. The tourism sector is an important sector within the relevant policy environments. The sector accounts for 7-13% of employment and 2-5% of GVA across socio-economics local study areas under consideration. The most significant is the Leith socio-economics local study area, resulting from the concentration of activity in Edinburgh. The scenery and landscape are the most commonly cited reasons for visiting Scotland, and a key driver for repeat visits. When considering coastal tourism, active pursuits such as swimming, sailing and watersports make up 49% of visitors' activities. Walking is also a very popular activity.
- 257. Looking towards the future, the available data shows relatively weak performance of the Scottish economy anticipated in the medium term, with a declining working age population and falling levels of total employment. The offshore wind sector is identified as a key growth opportunity but is reliant on investments being secured, such as the Proposed Development. Without such investments the scale of growth in the offshore wind sector as forecast will not be realised.
- 258. A number of potential impacts on socio-economics and tourism activities, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development were identified. These included: supporting employment and GVA across Scotland and within the identified support facilities locations, including creating employment opportunities for local workers; increasing demand for short term, medium term and long term accommodation and housing from workers migrating into selected support locations; and potential impacts on the tourism and recreation sector. Following assessment the vast majority of effects will be beneficial, ranging from minor to major significance. The Applicant is also committed to a range of activities seeking to enhance the beneficial effects.
- 259. The impact on employment, GVA, and access to employment amongst local residents in activities (including the supply chain) associated with the development, manufacturing, construction and installation; operation and maintenance; and decommissioning of the Proposed Development was deemed to be of moderate to major beneficial significance across all of the local and national areas considered under all the assessed scenarios. This is significant in EIA terms. The Proposed Development will support existing employment through contracts placed with existing enterprises and support new employment and economic activity enabling the expansion of the offshore wind sector which is a high policy priority.
- 260. The impact on the demand for housing, accommodation and local services across the construction, operation and maintenance, and decommissioning phases was deemed to be of no greater than minor beneficial significance. This is not significant in EIA terms. The Proposed Development will support additional demand for short term (e.g. overnight tourist accommodation), medium-term (e.g. private rented sector housing, and long term (e.g. permanent housing) at different phases. The scale of additional

demand is generally negligible to low when compared to the existing baseline and available capacity. The majority of temporary workforce associated with the construction phase will be accommodated offshore.

- 261. The impact on tourism and recreation activity and its associated economic value has been assessed as no greater than minor beneficial for almost all geographic areas considered. This is not significant in EIA terms. There is potential for minor adverse impacts within the local study area covering the local authority areas of East Lothian and Scottish Borders due to low level disruption to recreational users of the sea. The detailed assessments of disruption to activities have not found these to be substantial. This is not significant in EIA terms.
- 262. Cumulative impacts from offshore energy developments were assessed and predicted as likely to result in no adverse change to the levels of significance assessed when considering the Proposed Development in isolation.
- 263. No likely significant transboundary effects with regard to socio-economics and tourism from the Project on the interests of other EEA States were predicted.

1.18. CULTURAL HERITAGE

- 264. Cultural heritage, in the context of the current assessment, refers to historic monuments, buildings and sites that are valued for their architectural, historic or archaeological interest, together referred to as cultural heritage assets. The cultural significance of such assets draws to varying degrees upon their setting.
- 265. This assessment has identified cultural heritage assets as receptors where the Proposed Development might conceivably result in change that would adversely affect their cultural significance. This has been done through desk-based research, consultation and the use of a Zone of Theoretical Visibility (ZTV). The receptors include selected castles, lighthouses and ecclesiastical sites of national importance on the coast.
- 266. The assessment of the cultural significance of these receptors drew heavily upon visual relationships with the seascape. Owing to the history of intensive activity, the setting of assets on the coastal plain and in the Lammermuirs, at the fringe of the cultural heritage study area, inevitably contains Modern features. Consequently, whilst numerous assets in the cultural heritage study area have strong visual relationships with the sea, very few are sensitive to distant change.
- 267. The assessment, informed by appropriate visualisations, concluded that the Proposed Development will result in visual change in the setting of the cultural heritage receptors, but that that this will not affect the cultural significance of the receptors except in one case where a minor adverse effect (not significant in EIA terms) is predicted. These conclusions reflect the distance of the Proposed Development from the receptors. It lies over 30 km from the coast and hence all the receptors, except for the Bell Rock lighthouse, which is 24 km away. At such distances the Proposed Development will be visible only intermittently and will appear as part of the distant seascape. Whilst the receptors' cultural significance draws upon visual relationships with the sea and relatively long-range views, such distant change in the seascape does not have the potential to result in likely significant effects in EIA terms.
- 268. The potential for cumulative effects to arise from the Proposed Development in combination with other offshore wind farms within 60 km was considered. It is considered that there is no potential for cumulative effects to occur. No likely significant transboundary effects with regard to cultural heritage from the Project on the interests of other EEA States were predicted.

1.19. WATER QUALITY

- 269. Water quality refers to the chemical, physical, and biological properties of the aquatic environment that allow ecological communities that depend upon water to function in a healthy and sustainable way. It also

refers to the standards that convey safety for human contact, either for use as drinking water, or for recreational and commercial activities. The human and ecological contexts coincide when considering aquacultural ventures such as shellfish and finfish cultivation, and the harvesting of wild fish stocks. Water quality standards in the UK are based upon the levels of specific pollutants (particularly the presence of heavy metal and organic compound contaminants), biological indicators such as *E. coli* and intestinal enterococci, and the concentration of suspended sediments. The EU Water Framework Directive (2000/60/EC) and MSFD (2008/56/EC) obliges EU member states to ensure that water bodies attained good ecological status. These Directives were transposed into Scottish Law by the Water Environment and Water Services (Scotland) Act 2003, and the Marine Strategy Regulations 2010, respectively. Similarly, the EU Bathing Water Directive (2006/7/EC) obliges EU member states to monitor designated bathing waters within their jurisdictions, and this was transposed to Scottish law by the Bathing Waters (Scotland) Regulations 2008. All EU-derived legislation pertaining to water quality has been retained following the UK's exit from the EU, and these form the legislative framework that directs the approach to assessing the significance of impacts related to the Proposed Development.

- 270. The baseline environment for the water quality study area was established through a detailed desktop review of existing studies and datasets. Key features of relevance to water quality were the four WFD water bodies in the vicinity of the Proposed Development array area and export cable corridor, and eight designated bathing water sampling locations. Two WFD water bodies (Barns Ness to Wheat Stack (ID: 200038), and Firth of Forth Outer – Offshore (ID: 200055)) were found to be directly affected by the Proposed Development, as the Proposed Development export cable corridor overlaps them. Two bathing water sampling locations (Thorntonloch (ID: UKS7616059) and Whitesands (ID: UKS7616062)) are located within 2 km of the Proposed Development export cable corridor.
- 271. The WFD assessment (volume 3, appendix 19.1) concluded that the hydromorphology, biology (habitats and fish), water quality and INNS receptors associated with the four WFD water bodies were not at risk of being significantly impacted by the Proposed Development. The Thorntonloch bathing water and Outer Firth of Forth and St Andrew's Bay Complex SPA are located within 2 km of the Proposed Development and are therefore required to be taken forward for the WFD assessment of effects.
- 272. A number of potential impacts on water quality receptors, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included increased risk of introduction and spread of INNS, accidental release of lubricants, chemicals or similar, operational painting and cleaning of marine growth and deterioration of water quality from offshore export cables landfall works. With the proposed mitigation measures in place, the impacts result in effects of either negligible to minor or minor adverse significance and are not significant in EIA terms.
- 273. Accidental release of lubricants, chemicals or similar was deemed to be of minor adverse significance (i.e. not significant in EIA terms) to water quality receptors in the water quality study area. This is because the receptor was deemed to have medium sensitivity to this impact, but the magnitude of impact is predicted to be low since it would be of local spatial extent, short term duration, to be intermittent in occurrence and to be highly reversible.
- 274. Operational painting and cleaning of marine growth was also deemed to be of minor adverse significance (i.e. not significant in EIA terms). The receptor was again deemed to have medium sensitivity to the impact, but the magnitude of the impact was predicted to be low. This is because operational painting would be of local spatial extent, short term duration, to be intermittent in occurrence across the lifespan of the Proposed Development and its impact will be highly reversible, and cleaning of marine growth will be undertaken only by ad-hoc use of jet washer (i.e. no additional cleaning fluids).
- 275. Likewise, deterioration of water quality from offshore export cables landfall works was deemed to be of minor adverse significance (i.e. not significant in EIA terms) as the receptor was deemed to be of medium sensitivity, but the magnitude of the impact is predicted to be low due to the limited temporal and spatial extent of the works, and because its impact is likely to be highly reversible.

276. Cumulative impacts from the increased risk of introduction and spread of INNS were assessed and predicted as likely to result in effects of negligible to minor adverse significance upon water quality receptors within a 25 km buffer of the Proposed Development. This does not exceed the likely significance of the Proposed Development in isolation, so cumulative effects are not considered to be significant in EIA terms.
277. No likely significant transboundary effects with regard to water quality from the Proposed Development on the interests of EEA States were predicted.
278. A number of potential impacts on water quality receptors in the intertidal area, associated with the construction, operation and maintenance, and decommissioning phases of the Proposed Development, were identified. These included increased risk of introduction and spread of INNS, accidental release of lubricants, chemicals or similar, operational painting and cleaning of marine growth and deterioration of water quality from offshore export cables landfall works. With the proposed mitigation measures in place, the majority of these impacts result in effects of either negligible to minor or minor adverse significance.
279. Accidental release of lubricants, chemicals or similar was deemed to be of minor adverse significance (i.e. not significant in EIA terms) to water quality receptors in the intertidal water quality study area. This is because the receptor was deemed to have medium sensitivity to this impact, but the magnitude of impact is predicted to be low since it would be of local spatial extent, short term duration, to be intermittent in occurrence to be highly reversible.
280. Likewise, deterioration of water quality from offshore export cables landfall works was deemed to be of minor adverse significance (i.e. not significant in EIA terms) as the intertidal receptor was deemed to be of medium sensitivity, but the magnitude of the impact is predicted to be low due to the limited temporal and spatial extent of the works in the intertidal area, and because its impact is likely to be highly reversible.
281. Cumulative impacts from the increased risk of introduction and spread of INNS were assessed and predicted as likely to result in effects of negligible to minor adverse significance upon water quality receptors within the intertidal area. This does not exceed the likely significance of the Proposed Development in isolation, so cumulative effects are not considered to be significant in EIA terms.
282. No likely significant transboundary effects with regard to intertidal water quality from the Proposed Development on the interests of EEA States were predicted.

1.20. INTER-RELATED EFFECTS

283. The inter-related effects for all topics have been considered and are detailed above. It has been possible to conclude that inter-related effects across phases of the Proposed Development will not result in combined effects of greater significance than the assessments presented for each of the individual phases. It has also been concluded that multiple effects will not interact in a way that are likely to result in greater significance than those assessments presented for individual receptors.
284. The assessments within volume 2, chapter 9 of the Offshore EIA Report concluded that none of the potential impacts arising from the Proposed Development alone or in combination with other projects, would result in significant adverse effects on prey species.
285. This ecosystem effects assessment concluded that whilst colonisation of foundations, scour protection and cable protection has the potential to lead to localised increases in fish species through potential reef effects, any increases would be localised and are not expected to lead to a significant increase in prey species.
286. Predator species most vulnerable to changes in prey availability arising from the Proposed Development impacts include harbour porpoise, harbour seal, minke whale and kittiwake. However, as significant

changes to prey species as a result of the Proposed Development alone and in-combination with other projects are not predicted, significant effects on the key predator species are also not predicted.

287. It is concluded that there will be no adverse effects on seabirds arising from changes in the behaviour or availability of prey species for seabirds as a result of the Proposed Development. As outlined above, the majority of seabird species have a variety of target prey species and have large foraging ranges, meaning that they can forage for alternative prey species or move to other foraging areas if prey becomes temporarily unavailable due to construction activities.

1.21. MAJOR ACCIDENTS AND DISASTERS

288. This section summarises the assessment of the likely significant effects both that the Proposed Development presents and is susceptible to from the existing environment regarding major accidents and disasters.
289. The baseline presented for major accidents and disasters is based on a summary of the information collected through a detailed desktop review of existing studies and datasets for the following chapters:
- Berwick Bank Wind Farm Offshore Scoping Report (SSER, 2021a).
 - volume 2, chapter 10: Marine Mammals;
 - volume 2, chapter 12: Commercial Fisheries;
 - volume 2, chapter 13: Shipping and Navigation;
 - volume 2, chapter 14: Aviation, Military, Communications; and
 - volume 2, chapter 17: Infrastructure and Other Users.
290. The major accidents and disasters assessment of effects has followed the methodology that directs the assessment to focus on low likelihood but potentially high consequence events such as a major spill, explosion, fire, etc. (Institute of Environmental Management of Assessment (IEMA),2020).
291. The following potential impacts were assessed:
- collision and allision (to and from vessels and aircraft);
 - snagging (to and from fishing vessels);
 - unexploded ordinance (unplanned detonation);
 - pollution of the marine environment (from vessels and structures); and
 - fire at OSP/Offshore convertor station platform.
292. The assessment of effects established that for all risks identified, designed in measures would be sufficient to suitable manage the risk.
293. As there are no likely significant effects relating to major accidents and disasters after consideration of the designed in, no assessment of cumulative, inter-related or transboundary effects has been undertaken.

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